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Edited By

Sue Baughman, Association of Research Libraries

Steve Hiller, University of Washington

Katie Monroe, Association of Research Libraries

Angela Pappalardo, Association of Research Libraries

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Conference Overview

The sixth Library Assessment Conference was held in Crystal City, Virginia, in 2016; it also marked the 10th anniversary of the conference series. Conference participants engaged in a variety of sessions and workshops that represented the diversity of assessment efforts taking place in libraries. Registration reached a new high of 640, a reflection of a sustained library assessment community, while 38 regular format papers and 72 short papers were presented.

# sessions	Session Themes	# sessions	Session Themes
3	Space	2	Collections
1	Special libraries	3	Methods
2	Services	1	Data
2	Value	4	Organizational issues
1	Data	3	Learning

In addition, there were 75 posters presented covering these themes.

We thank our keynote speakers, Molly Broad, Lisa Hinchliffe, and Brian Nosek, for their informative and engaging talks that set the tone for the conference. We also deeply appreciate the efforts of the Steering Planning Committee, conference volunteers, and ARL staff who helped with the planning of the event, on-site activities, and logistics. All of these efforts made the conference enjoyable for everyone.

The conference sponsors provided both financial support and information on a range of services that can benefit the assessment community. Most of all, we thank the presenters, workshop leaders, and conference attendees, without whom this conference could not have taken place. You are the future of library assessment!

We look forward to the 2018 Library Assessment Conference and plan to announce the date and location soon. See you in 2018!

Best regards,
Conference Co-Chairs
Steve Hiller
Sue Baughman

Sensemaking for Decisionmaking

Lisa Janicke Hinchliffe
University of Illinois at Urbana-Champaign, USA

Abstract

Library assessment has matured as a specialty area of practice and academic library assessment programs continue to grow. Attention is needed, however, to aligning assessment activities with planning and decision making. Library leaders must pursue evidence-based decision making and not "decision-based evidence-making."

It is an honor to give this plenary address here today. As I reflected on Molly Broad's presentation just now, *Higher Education at a Crossroads*, I am struck by how much what is affecting libraries and library workers is not in our control or even in the control of our institutions. Whether in private or public institutions, we are buffeted by the same strong winds of change and challenge. Societal and political pressures related to increased demands for accountability and lessening public investment manifest themselves in many ways. We are all aware of the challenges of degree completion, the contingent faculty workforce, and technological change.

It is not just academic institutions that are experiencing change, competition, and questions about their value. Libraries are as well. Google and other web search engines as well as online open publication of, and thus access to, information resources have changed what a library can be, what roles are even possible.

Most of the work I did as a graduate assistant when I was completing my master's degree in library science no longer exists. I had a great job and spent much of my time looking up facts in directories, almanacs, etc. I can't help but smile to think back to that time when we had intense debates about which 50 books to keep at that "ready reference" desk. This is no longer the work of graduate assistants at the information desk in the University Library at Illinois.

This fact is unsettling to some. For others it is an opportunity. Regardless of whether we like it or not, these changes demand a pivot from a previous role, or set of roles, to new ones.

I think it is tempting to retreat to platitudes and assertions about the library as the "heart of the university" or the like. And, in honesty, we are lucky. Because people love their libraries, we have time to pivot. Other campus units or social institutions would not be given the grace period that we have because they are not so beloved. But libraries, and library workers, cannot live on love alone. It is a cold, hard fact that to do good in the world, we need resources. And, by resources, of course, I mean money. Because whether it is staffing, collections, technologies, space, etc., all of these are acquired through money.

Now, by our nature, libraries are collectivist institutions, seeking the good of all in our communities, not just of particular individuals alone. We are, as they say, "built for purpose" relative to our communities. I have been heartened that, of late, we have seen a reawakening and rediscovery of our social purpose in academic libraries, a return to a progressive perspective. We are embracing that the value we create through libraries is not just economic but also—through thoughtfully developed and shared services and collections—inclusion, equity, and social justice; that we are pursuing the creation of value through our values. We are recognizing that, if we choose to—and I believe that we should, we can, and we will—we can meet the demands of accountability by the impact of our value-informed work.

So, what of assessment?

Playing off of Molly's theme of being at a crossroads, I would like to suggest that assessment can serve our libraries, and thus our institutions, in at least three ways—as map, as compass, and as strategic guide.

These serve what I see as the mission for library assessment: *sensemaking for decisionmaking*.

Assessment as a map provides us with the "lay of the land"—a high-level and holistic view of the terrain, climate, and locations of key landmarks. Assessment can tell us what is happening by gathering data points but then also providing analysis and interpretation in order to reveal the patterns and trends in what has occurred over time. This descriptive information includes inputs, outputs, outcomes, and impacts—placed in context and in comparison. This assessment work reveals different scenarios and possibilities. And, like the beautifully illustrated maps of bygone eras, it might even reveal where "there be dragons!" to work around and guard against.

Assessment as compass reveals possible directions—possibilities for growth, improvement, and new initiatives—and shows these relative to our "north star," our purpose and mission. This data shows us options and choices that can be made. A compass does not, however, tell us which direction to choose; it only illuminates options and pathways and helps us get our bearings. It illustrates what we will walk away from in order to walk towards other directions.

Assessment as strategic guide empowers making choices and decisions that align resources and activities with our goals, mission, and purpose. Data is not a decision. But decisions should be based on data. Decision making, based on data, must be firmly grounded in values and mission, maximizing impact and efficiency, in pursuit of a vibrant future, which can only emanate from strategic options chosen today.

I would like to take a moment here to point out that the future of libraries is made by choices we make today. And tomorrow's today. And the next day's today. The future is not some single choice made once and at a single point in time; it is the cumulative and ongoing creation of our decisions on each today. We will make a future for our libraries out of whatever choices we make and not choosing is still a choice. It is possible to make a future by not choosing.

This is what makes it all the more important to be vigilant about the quality of our library assessment work and its purpose. We must ensure that our libraries are pursuing evidence-based decision making and not engaging in "decision-based evidence-making."

Let me say that again. Are you engaging in "decision-based evidence-making" rather than "evidence-based decision making?" Is your library's assessment program finding data to support already-made decisions? Or, is it providing the data from which decisions are then made?

Molly challenged us to think about our institutions and what they need to be—and, by extension, what our libraries need to be. We need to also turn our attention to whether our library assessment programs are what they need to be.

Library assessment efforts have matured in the last decade—from historic focus on inputs and outputs to our current attention to outcomes, impact, and value. I look around this room and see leaders in that effort and hundreds of people who have done the challenging work of making that happen in all of our individual libraries. I would like to think that I have made a contribution to that—in my own library and in the professional as well. And so, with these next remarks, I am challenging myself as much as all of you.

Are our library assessment programs as effective as we need them to be? How do we know? How could we know? How do we avoid "decision-based evidence-making" about our own assessment programs?

Recently, a higher education assessment listserv had an interesting discussion on "assessing assessment" on campus. At the most recent Indianapolis Assessment Institute, I attended a presentation on a forthcoming "assessment maturity" instrument. We need to be having this discussion in libraries as well.

We set out to embrace and expand our library assessment efforts in the belief that it would be helpful to understanding our purpose and achieving our goals. We in the library assessment community have convinced our library colleagues of the utility and value of gathering data, reflective analysis, and affirming or iterating to improve library practices. Can we tell this same story of our library assessment programs? Are we gathering evidence about how well our assessment efforts serve our libraries, colleagues, and administrators?

I have put forth the claim today that library assessment can serve as map, compass, and strategic guide at this time of being at a crossroads in higher education. It is crucial that we ask ourselves whether we in library assessment are achieving that. How well are library assessment programs serving library needs as a map of descriptive information, a compass revealing possible directions, and a strategic guide for choosing? How well are our library assessment programs ensuring that our libraries can get to our destinations, driven by clarity of purpose, that is, the needs and successes of our campus communities?

Are we fulfilling the promise of *sensemaking for decisionmaking*?

Professor/ Coordinator for Information Literacy Services and Instruction, University Library
Affiliate Faculty, School of Information Sciences
University of Illinois, 1408 West Gregory Drive, Urbana, Illinois 61801
ljanicke@illinois.edu

Measuring the Impact of Digitizing 24,000 Print Theses and Dissertations at UMass Amherst

Jessica Adamick
University of Massachusetts Amherst, USA

Abstract

The University of Massachusetts Amherst Libraries have begun to digitize and make open access our entire collection of 24,000 print theses and dissertations. Two years into the 10-year project, we can assess a variety of factors. There is a large body of data available for analysis of author responses, download counts, circulation counts, and donations. Low author opt-out rates demonstrate author support for the project, and high download counts demonstrate the immediate impact of an open access format for theses and dissertations. A successful development strategy is clearly identified. All of these data legitimate this massive digitization project.

Introduction

The entire collection of over 24,000 print theses and dissertations at the University of Massachusetts Amherst will be digitized and made open access over the next decade, having a huge effect on the visibility and use of these research products. Digitizing a thesis and dissertation collection is an enormous undertaking that requires human and financial resources; nearly every department in the UMass Amherst Libraries has been involved with this project.

Few universities have embarked on the digitization of print theses and dissertations. As more universities have adopted open access models for electronic theses and dissertations in their institutional repositories, it is only fitting that we work to increase the open access availability of the entirety of our theses and dissertations collections instead of having an accessibility gap between print and digital.

There are several components to this massive digitization project: selection of works to digitize and associated outreach to departments, contacting authors, development, processing materials, digitization, preparation for dissemination in software systems, dissemination through our institutional repository, and follow-up with authors. There are opportunities to assess various aspects and outcomes of this project at nearly every stage. This paper examines the impact of this project by comparing print circulation and download statistics with a disciplinary analysis, publication date analysis, and digital version upload date analysis. It also reviews author donations and responses to project notification letters.

Having the data on hand that demonstrate increased use of these unique research products can effectively legitimate this work. Demonstrating author enthusiasm for open access is also beneficial for supporting this type of project. Early results from the project may help other institutions decide if digitizing their theses and dissertations would be worthwhile, based on use and author engagement.

Literature Review

Little information beyond a few key articles was found about the assessment of retrospective theses and dissertations projects. A study at the University of Arizona calculates the total cost of ownership of an electronic theses and dissertations project and includes a print versus digital version analysis, but the library is not working on digitizing print theses and dissertations, and so those are not part of the analysis."[1] A process and cost analysis of digitizing dissertations for an institutional repository at the University of Massachusetts Medical School includes an author permissions response analysis and an overall print circulation versus digital download analysis as well as the digitization cost calculations.[2] At the UMass Medical School, 74% of authors gave permission to post their dissertation open access, and downloads were 24 times the amount of print circulation in just 17 months versus five years. Finally, the London School of Economics performed a study exploring the impact of the online dissemination of theses on an institution's research profile, and the place of digital theses in scholarly communication.[3] Working with a set of 2,000 theses,

the authors analyze permissions responses: 0.7% opted out of open access and five takedown notices were received. No correlation was found between the number of downloads a work received and the number of citations it received. The authors also analyzed traffic sources and conducted focus groups with undergraduates, postgraduates, and librarians on the awareness and perceptions of digital theses.

Project Overview

After a pilot program to test a basic workflow, the UMass Amherst Libraries' retrospective digitization project implemented the following process in earnest in 2014. Selected theses and dissertations are shipped to the Internet Archive's Open Content Alliance for digitization. We handle all other components of the project in-house.

Departments are selected for digitization each year, and we have the budget and capacity to digitize about 2,500 works annually. These works are uploaded to our institutional repository, ScholarWorks@UMass Amherst (ScholarWorks), where born-digital electronic theses and dissertations are also hosted. We select works for digitization by department (instead of publication year, for example), due to the opportunities for outreach and development. Another criterion for selection is department size; we select a variety of departments whose works combined equal about 2,500. The following departments have been selected for digitization so far, representing a diverse set of disciplines: Afro-American studies, astronomy, Chinese, education, history, polymer science and engineering, philosophy, political science, and psychology. Once a department is selected, the deans and department heads are then notified of the project and that the libraries will be contacting their alumni.

Our copyright analysis allows the libraries to post all theses and dissertations in our institutional repository, because the libraries already distribute print theses and dissertations through circulation and interlibrary loan, and only the format of work has changed. However, authors are contacted, notified of the project, and given an opportunity to opt in or out of having their thesis or dissertation made open access. Their responses are recorded. If an author opts in, their work is digitized and made open access through our institutional repository, and they are sent a link to their work. If an author opts out, their work is still digitized for preservation and lending purposes, but their work is only made available digitally through on-campus access or through interlibrary loan services.

In the notification letters, it is suggested that authors donate the average cost of digitization ($50) to support the project. For the first year of the project, donations were suggested at the point when the author was sent the link of their digitized thesis or dissertation. This included Afro-American studies, astronomy, Chinese, history, and psychology. One exception was polymer science and engineering; because that department was celebrating a major anniversary, the libraries worked with the department to fundraise, and the polymer science and engineering department collected the donations themselves. For the second and third years of the project, authors were notified of the opportunity to donate at the point of first contact. This approach applies to education, political science, and philosophy.

Methodology

Over two years of the project have been completed and all available author response, download, circulation, and donation data have been analyzed. As of September 2016, about half of the author notification letters from the education, philosophy, and political science batch had been sent out.

A major challenge in analyzing the project's data is the lack of common unique identifiers between the three main systems used: ScholarWorks (our institutional repository), Aleph (our integrated library system), and a development database. To allow analysis at the item level, records from the various systems had to be matched up, which is done in Microsoft Excel. We created unique identifiers based on fragments of fields such as author name, dissertation or thesis title, or graduation year, and then were able to match most records. However, there were numerous records without a match due to variations in fields comprising the unique identifiers. It is beyond the scope of this paper to manually match these records, so there are some missing data.

Tracking Author Responses

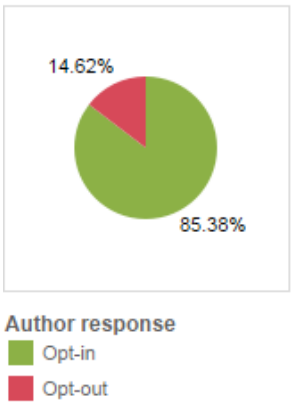
The astronomy, Chinese, history, polymer science and engineering, and psychology alumni have received notification letters and their responses are fully tracked and available for analysis. At the time of publication, about half of the education, philosophy, and political science alumni had

received notification letters, and responses from those alumni are available for analysis. Author responses are recorded in a "master file" in Excel that includes bibliographic data, author contact information, workflow steps, and, eventually, links to the institutional repository.

Tracking Download Counts

There are 2,012 works in astronomy, Chinese, history, polymer science and engineering, and psychology available for analysis by download count. Download counts are recorded through ScholarWorks, the institution's institutional repository, which is run on bepress Digital Commons software. Metadata record hits are also available through the software, but this paper focuses on downloads of the actual work, since that measure is the closest analog to print circulation counts. Download counts are exported to Excel.

Figure 1: Author Opt-in and Opt-out Rate



Tracking Circulation Statistics

There are 1,898 works available for circulation analysis. Circulation of print theses and dissertations is recorded through Aleph, the libraries' integrated library system, and those data begin in 2006, the year that the libraries migrated software. These data are exported to Excel.

Tracking Author Donations

Ninety-nine donations were received and are available for analysis by donation rate. Donations are recorded in a development database and are exported to Excel.

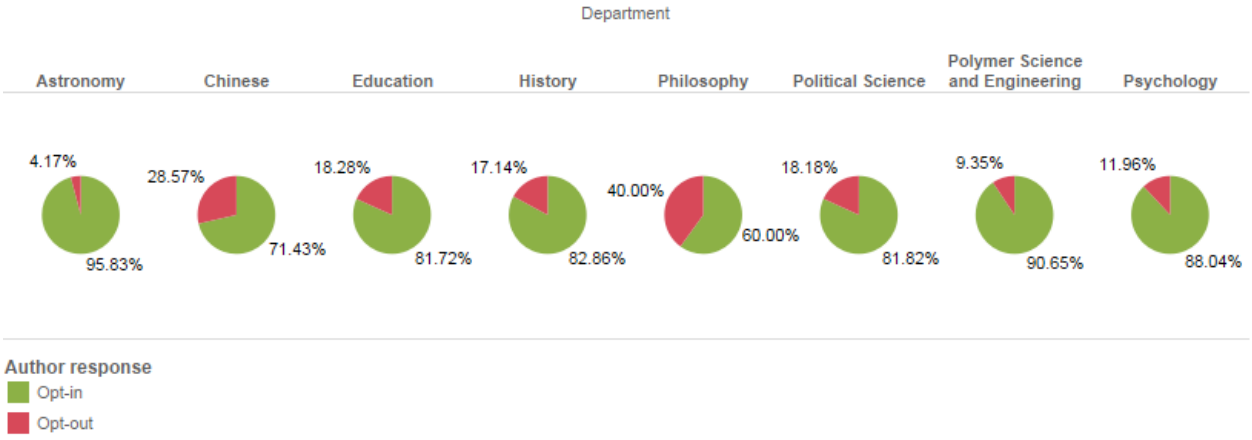
Findings

Author Responses

The great majority of authors (85.38%) opted in to the open access component of the digitization project (Figure 1).

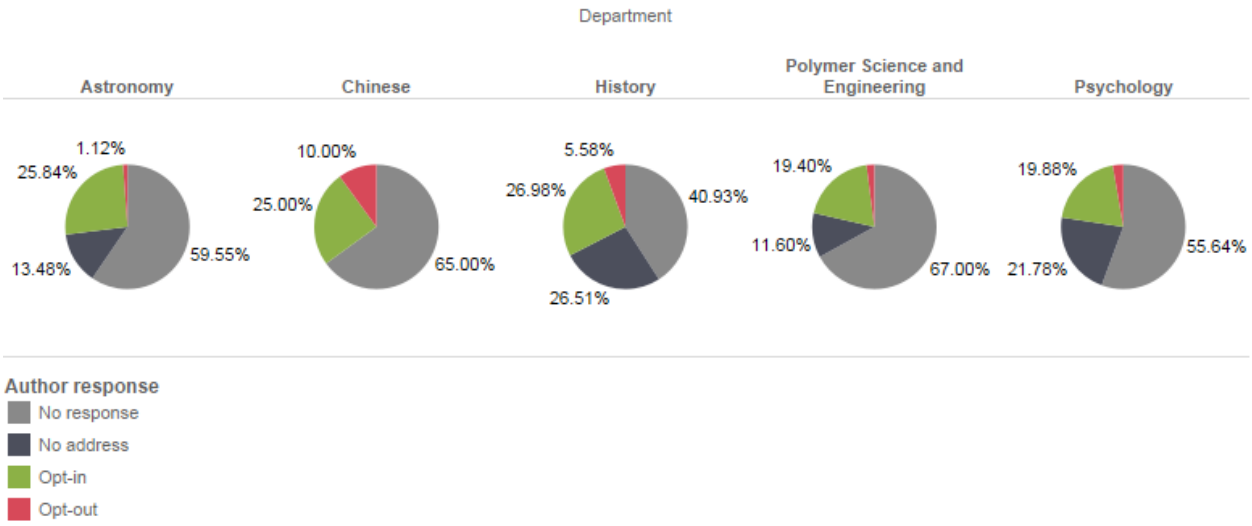
Across all departments, the majority of authors who responded to the notification letter opted in to the project (Figure 2). The departments with the highest opt-in rates are astronomy (95.83%), polymer science and engineering (90.65%), psychology (88.04%), and history (82.66%). Philosophy has the highest opt-out rate at 40%, but not all authors had received their notification letters at the time of publication.

Figure 2: Author Opt-in and Opt-out Rate by Department



While we had author contact information for most authors in every department, across disciplines, most authors (56.38%) who received a digitization notification letter did not respond (Figure 3). Education, political science, and philosophy are excluded from this figure, since not all alumni had received their letter at the time of publication.

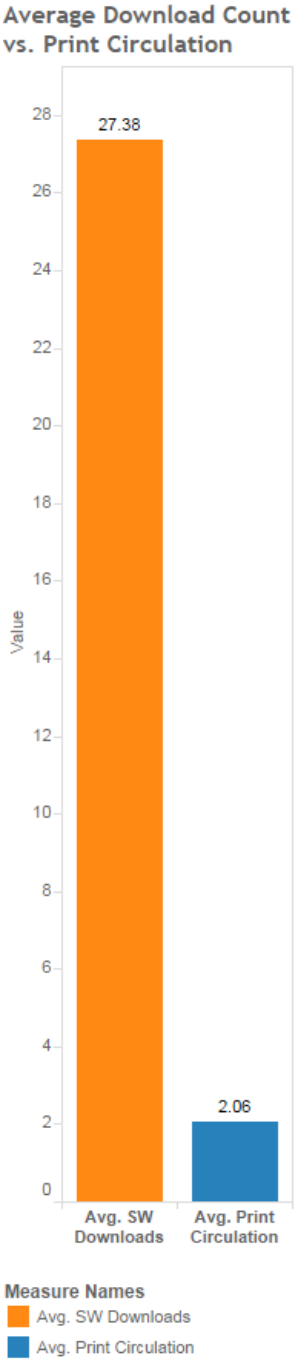
Figure 3: Author Responses by Department



Download and Circulation Counts

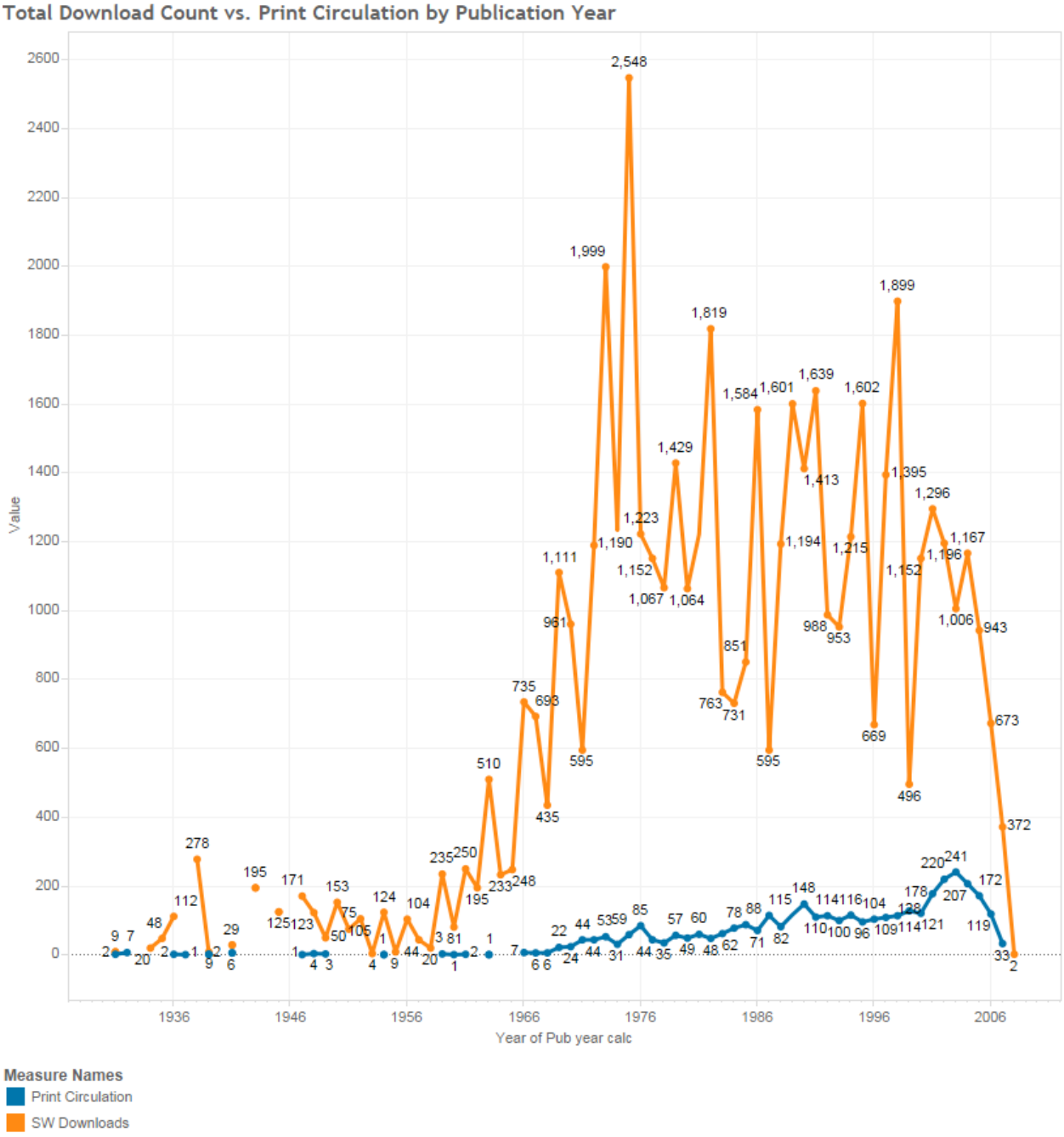
The average download count for digitized theses and dissertations in ScholarWorks is 27.38 downloads, and the print circulation of the digitized theses and dissertations, on average, is 2.06 times (Figure 4). Institutional repository download data is from the previous two years, and circulation data is from the last 10 years.

Figure 4: Average Download Count vs. Print Circulation



Recently published theses and dissertations receive more total download counts and total circulations than older theses and dissertations (those published prior to the 1970s) (Figure 5). Still, the older works are seeing more digital use than print use.

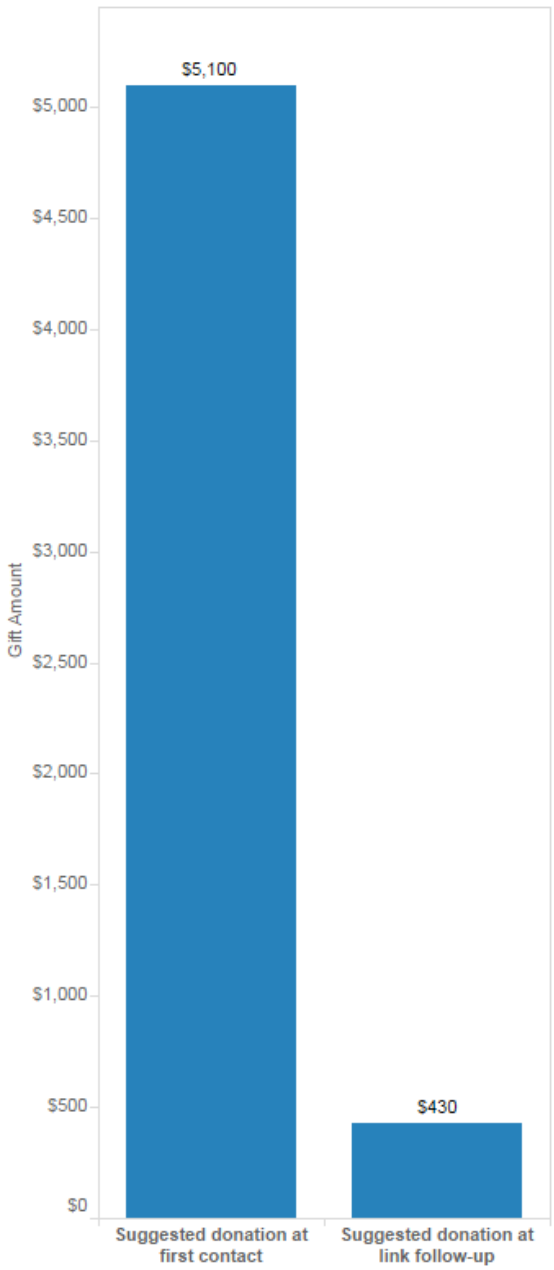
Figure 5: Total Download Count versus Print Circulation by Publication Year



Author Donations

Two strategies were used to collect donations to support the digitization project (Figure 6). The first year, authors were sent a notification letter, and we sent the authors who opted in a link to their digitized work when it was complete. We suggested a donation at the time they received the second contact. This strategy produced $430 in donations. The second strategy involved suggesting a donation with the point of first contact with the digitization notification letter, and this produced $5,100 in donations.

Figure 6: Suggested Donation Models and Associated Donations



Discussion

Author Responses

Every department's alumni responded to the digitization notification letter with significantly more opt-ins than opt-outs. Some of these responses make sense in the context of what we know about the disciplinary practice of sharing scholarship, like the very low opt-out rate for astronomy and the slightly higher opt-out rates for humanities disciplines like history and Chinese.

The biggest takeaway related to author responses is that we can confidently proceed with the project without worrying that alumni will be upset if their works are digitized and made available in an open access manner. We considered at the start of the project that it would be possible that many alumni

would opt-out of open access, considering that many of them developed their thesis or dissertation in an entirely different scholarly communication context before the advent of the Internet.

Download and Circulation Counts
While it will be no surprise to the library community, digital downloads of theses and dissertations dwarf print circulation of these works. In just two years, the digitized theses and dissertations have accumulated, on average, 13 times the amount of use than the print copies received in 10 years. This immediate increase in use clearly illustrates the elevated profile that these valuable research products receive once they are available not just digitally, but in an open access format.

The older works (published prior to the 1970s) receive less use in both digital and print format, which may be interpreted as the more recent scholarship being part of active scholarly communication, whereas the older works may have transitioned to archival sources after a few decades. The older works have still seen increased use and they also benefit from digital preservation strategies.

Author Donations
Between the two models for collecting donations, it is clear that suggesting a donation to all letter recipients at the point of first contact generates a much higher positive response, and that is the strategy that will be used going forward.

Each area of analysis produced very positive and affirming results, which are beneficial in a number of ways. We can see direct support of the project through author responses; the high opt-in rate demonstrates an acceptance of open access across generations, since many alumni developed their thesis or dissertation before the advent of the Internet or open access. Anecdotally, individual author responses have been overwhelmingly positive; many alumni have contacted staff who work on the project to offer their gratitude for the digitization service the libraries are providing, and sometimes to reminisce about their time at UMass. The opportunities for alumni and departmental engagement have exceeded our expectations.

The use analysis demonstrates immediate impact; the majority of print theses and dissertations in our collection have not circulated, while nearly every thesis or dissertation in ScholarWorks has been downloaded. The highest print use for an item in this batch of digitized works is 15 circulations, while the average download count is 27.38 downloads. While not surprising, the use of the online versions is affirming to the project.

Finally, this is a massive project that nearly every department in the library touches, and being able to share some positive early data with library staff is a great opportunity to demonstrate the benefits of this project to those who work on it.

Conclusion

Analyzing the data produced by a massive theses and dissertations digitization project at the University of Massachusetts Amherst Libraries reveals very positive early results. Authors, when they did respond to the digitization notification letters, overwhelmingly opted in to the project, demonstrating an affinity for open access. Downloads in the past two years dwarfed 10 years of print circulation by a factor of 13 to one, demonstrating the value of digital and open access formats. Observing such high immediate use affirms the project beyond preservation goals. We were also able to identify a more successful development strategy of suggesting a donation upfront to all authors, which will be the strategy going forward.

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Research as Design—Design as Research: Applying Design Thinking to Data Management Needs Assessment

Cinthya Ippoliti
Oklahoma State University, USA

Introduction

Data management has exploded into the world of higher education in the last five years and libraries have found themselves at the forefront of this movement. Some have quickly developed infrastructure and support for every activity ranging from data storage and curation to project management and collaboration, while others are now just beginning to think about addressing the needs of their researchers.

Regardless of which end of the spectrum they identify with, libraries are still seeking to understand the research landscape both within their organizations and on a national level and define their role in the process.

Institutional context

Oklahoma State University (OSU) has been classified as a research university with high research activity. The total student population at OSU's primary campus in Stillwater, Oklahoma, is approximately 24,000, with an undergraduate population of approximately 20,000. Edmon Low Library is the primary library on campus and is used by undergraduates, graduates, and faculty.

The Research and Learning Services (RLS) division of the library includes an associate dean, ten librarians (six of which are liaisons, one is the director of the liaison program, two are directors of undergraduate/graduate student outreach, instruction and research respectively), and a first year experience librarian. The division also includes an instructional developer and a faculty coordinator for undergraduate outreach as well as two graduate student assistants and an intern.

The impetus for this project emerged out of a recent library reorganizational effort that sought to:

1. Develop strong internal and external partnerships in order to facilitate outreach efforts as well as build momentum and support for collaborative projects and initiatives.
2. Shift collection development duties from buying resources to reach a specific dollar amount to analyzing the collections and communicating with departments in order to better focus energies and expertise into building strong collections that can support the general needs of digital scholarship activities with targeted discipline-specific assets.
3. Provide systematic and ongoing internal training in areas such as data management and data information literacy, open access, tools such as Altmetric, and the new Framework for Information Literacy.
4. Update existing primary assignments to provide a way to determine our impact on university-wide strategic goals such as student learning and faculty productivity.
5. Literature review

Our study is not the first to address data needs of faculty, but it is the first to employ the design thinking analysis model for a qualitative-based process. Our results closely mirror those uncovered at Oregon State University where it was found that faculty generate broad data types, with relatively small data sets, and manage their own servers.[1] In addition, we also had the same challenges in terms of raising awareness of our services and we found outreach to be a key component of our efforts.[2] Jerry Sheehan, et al. discuss their two-pronged approach at Montana State University, which includes both surveys and interviews. Their findings of varying definitions and attitudes towards open data as well as the need for collaborative efforts at the campus level closely align with our own action items delineated below.[3] The study conducted by Gu, et al. points to an interesting idea that has not appeared elsewhere in the literature, that is, the need to conduct a scan of existing services and resources prior to conducting interviews in order to help inform the conversation that will ensue during the interview and help raise further awareness of what is already available.[4]

Similarly, the study conducted by Buys and Shaw at Northwestern University indicates that researchers struggle with "issues with long-term storage, data organization and management, knowledge of data management plans, and need for consultation and instruction."[5] Scaramozzino et al. discuss the interventions they implemented as a result of their data needs assessment to "broaden faculty awareness of data curation issues that span a wide array of disciplines."[6] Rolando, et al. continue this thread and speak to the need for libraries to develop "infrastructure, expertise, and services necessary to help researchers preserve and share their research data," which is an important element to consider as part of a broad vision for the role of the library in data management policies and activities.[7] Finally, Antell, et al. discuss the need for librarians themselves to be aware of both what skills they need in order to effectively collaborate with researchers as well as become aware of broader campus efforts in this arena. More specifically, they state that "science librarians have not come to a consensus about whether the data management role is a natural extension of their jobs, or a set of duties that would be better suited to librarians holding a different job title and assuming a different role within their respective organizations"[8] amidst unfamiliarity regarding data management "assistance and initiatives on their own campuses or even within their own libraries,"[9] which renders any type of needs assessment even more important in order to focus training and project collaboration based on campus priorities and appropriate expertise.

Study methodology

We worked with OSU's Office of Institutional Research and Planning to identify new and tenure-track faculty who had not yet achieved tenure, which was a total of 259 members. We interviewed 31, or 12%, of the total number who could have responded to our invitation.

We obtained IRB approval to contact all new and tenure-track faculty in order to schedule individualized interviews. Our research goals were as follows:

1. What are faculty needs for research data support relating to data management plans, data analysis and storage, data information literacy, and research impact?
2. What is the library's role in providing some or all of those services and resources?
3. Who else on campus is offering similar services and how can we create partnerships?
4. What training do librarians themselves need in order to provide quality services to support these needs?

Recruitment method (form and e-mails)

An e-mail was sent out to prospective participants:

> You are invited to participate in a research project conducted by the OSU Library. We are requesting to schedule 30-minute interviews with you so that we can ask you about your research and data management needs in the hopes that this information will allow us to provide new services and improve existing services in these areas. Your responses will be kept completely confidential. No personal information will be collected except for your discipline so that we can sort the data by that variant. Participation is voluntary, and responses will be kept confidential. You have the option to not volunteer. Completion of the interview will be interpreted as your informed consent to participate and affirms that you are at least 18 years of age. If you have any questions about this research, please contact project investigator Cinthya Ippoliti. If you have any questions regarding your rights as a research subject or if you feel your rights have been violated during the course of this project, contact the IRB Office, 223 Scott Hall, 405-744-3377.

Faculty then had the option of filling out a short form to indicate their interest as well as their preferred date and time.

Interview format and survey questions

The interviewers consisted of a combination of the associate dean for research and learning services and the head of the library liaison program, as well as the respective liaisons for each faculty's subject area. Interviews were scheduled depending on the faculty member's availability, but the liaison was present whenever possible. The interviews were conducted in pairs, held in the faculty member's office, and we collected hand-written notes that were later synthesized into an Excel spreadsheet where each of the questions represented the heading for a separate column paired with the answers for each faculty member. A sample portion of the spreadsheet is shown below.

Entry #	Date Crea	Date Upd	Date	1) What is	2) Do any	<u>If yes<	Do you as	Are you a	<u>If yes<	Quantitati	Geospatia	Digital dat	Digital tex
1	2016-04-20	11:23:40	Apr 04, 2016										
2	2016-04-20	11:59:52	Apr 04, 20	Technolog	Yes	yes	Themselv	Not Yet		Checked		Checked	Checked
3	2016-04-20	12:16:36		Sociology	No					Checked	Checked	Checked	
4	2016-04-20	12:26:54	Feb 17, 20	business	No					Checked		Checked	Checked
5	2016-04-20	12:37:18	Mar 11, 2016		No					Checked			
6	2016-04-20	12:45:48	Mar 11, 2016		No					Checked			Checked
7	2016-04-20	12:53:38	Mar 15, 20	Entomolo	No					Checked	Checked	Checked	
8	2016-04-20	13:18:32	Feb 26, 20	CEAT	Yes	he wrote the data plan off the top of his h				Checked	Checked		Checked
9	2016-04-20	13:36:28	Mar 24, 20	CEAT	Yes	He benchi	outside	nothing in Tulsa		Checked			Checked
10	2016-04-20	13:46:31	Mar 18, 2016		Yes					Checked			Checked
11	2016-04-20	13:53:15	Mar 16, 20	Engineeri	Yes	Copied colleague DMP from another proj				Checked			Checked
12	2016-04-20	13:57:19	Mar 24, 2016		Yes	NSF				Checked	Checked		Checked
13	2016-04-20	14:06:12	Mar 24, 20	NIDCD	No					Checked		Checked	
14	2016-04-20	14:10:53	Mar 23, 2016		No								
15	2016-04-20	14:15:44	Mar 30, 20	Arts and Sciences						Checked			
16	2016-04-20	14:21:05	Mar 29, 20	Human Sc	No					Checked		Checked	Checked
17	2016-04-20	14:25:42	Mar 29, 20	Arts and s	No							Checked	
18	2016-04-20	14:32:04	Mar 28, 2016		Yes					Checked			Checked
19	2016-04-20	14:49:16	Mar 23, 20	managem	No					Checked			Checked
20	2016-04-20	14:59:37	Mar 11, 20	Engineeri	Yes	to share h	no	no		Checked	Checked		Checked
21	2016-04-20	15:11:43	Apr 05, 20	Human Sc	No	She would follow gu		Has gotte	(I believe	Checked			
22	2016-04-20	15:23:23	Feb 25, 2016		No								Checked
23	2016-04-21	11:14:45	Mar 21, 20	Arts and S	Yes	Not yet, Spring		no		Checked			Checked
24	2016-04-21	11:34:23	Feb 25, 20	Engineeri	No								
25	2016-04-21	11:52:26	Feb 26, 20	History	No					Checked	Checked		Checked
26	2016-04-21	12:06:30		Constructi	No								
27	2016-04-21	12:18:09	Mar 09, 2016		Yes	not creating plans ye		Cinthya offered the		Checked			
28	2016-04-21	12:26:32	Mar 24, 2016		No					Checked			
29	2016-04-21	12:46:39		Human Sciences		Not at this	yes						
30	2016-04-21	12:57:11	Mar 09, 20	Zoology	No	Not at the moment but yes				Checked			
31	2016-04-21	13:06:45	Mar 09, 20	Human Sc	No	not at the	for MSR- so yes in the future			Checked		Checked	Checked

We adapted the framing questions from the Data Curation Profile Toolkit[10] and the University of Virginia Data Interview Protocol in the ARL Spec Kit 334.[11] The entire group of library interviewers met prior to scheduling interviews to ensure we all understood the goals of the questions we were asking as well as the importance of the first step of the design thinking process that focuses on asking open-ended follow-up questions in keeping with the theme of developing an understanding of faculty challenges and needs.

1. What is your primary unit of affiliation?
2. Do any of your funding sources require you to draft a data management plan? If yes, how do you go about creating this plan?
3. What type of data do you generate?
4. Who performs the majority of the following activities (e.g., PI/director, graduate students, researchers, IT staff, other)? Data collection; data documentation (metadata); data cleaning; backing up data; data analysis; data storage and organization; data sharing outside of your research group; data archive or long-term storage; data disposal/destruction associated with your research?
5. Does personnel within your department/college typically provide technical support or assistance with your OSU research? If so, who and to what extent? If not, what do you do to get help?
6. Does your research include the analysis of data collection by others (also referred to as secondary data)? Do you acquire secondary data from public, non-public/restricted, other researchers' data sources?
7. What has been the typical amount of digital data for a single project you have worked on in the past five years?
8. Do you generate metadata?
9. Could you please describe the system for version control that you have in place?
10. How often and how do you share your data with others?
11. What happens to your data after the research project has concluded?
12. How important do you think these services (data management planning; institutional repository; data storage; data carpentry; metadata support; research impact (Altmetric and ORCID) might be to you and your students and how likely would you be to use these services?
13. How important is it for your students to learn about data information literacy processes and tools?

Design thinking activities

Introduction to design thinking

Initiated at the Stanford D-School (http://dschool.stanford.edu/) and championed by IDEO CEO Tim Brown, design thinking is a way to approach a problem from the user's perspective. It is highly iterative and non-linear, and failure is encouraged. The process consists of several steps that are designed to solicit user input prior to engaging in the design process.

Empathy: The goal of this step is to develop a deep understanding of user needs and therefore comprehend the situation from their point of view. Most often, this takes the form of in-person interviews and asking open-ended questions to tease out what the user's challenges are in a particular context, whether it involves something physical, like lack of space, or more abstract, such as data management support.

Ideation: This step involves the distillation of the insights and needs into a compelling problem statement that can serve as a solution-generation springboard during the later steps. This stage is all about identifying patterns or problem statements as well as both explicit and implicit needs and focusing on generating as many "solutions" to solve them. These solutions are often framed as "How might we..." questions in order to open up the possibilities prior to thinking about constraints. For example, we might post a question such as "How might we assist faculty in storing their data sets in our institutional repository?" A final goal of ideation is to explore a wide range of solutions–both a large quantity of ideas and diversity among those ideas. From this grouping of ideas you can then build prototypes to test with users.

Prototyping: This step begins the process to narrow down solutions to those that are deemed most feasible and are ready to be piloted as a model—whether it is a service, tool, or program. Prototyping involves not only the creation of the model itself, but the activities surrounding it which consist of knowing what type of feedback might be sought, how it will be recorded, as well as a plan for letting go of what is not working and further developing what is.

Testing: Refine solutions and make them better based on the additional feedback received until a desired "final" result has been achieved. This final step comprises acting on the feedback received, communicating results or next steps with stakeholders and a wider audience as well as celebrating successes and seeing where improvements can still be made, and most importantly, trying again!

How we applied the design thinking process at OSU

Our empathy step had already been completed with our 31 faculty interviews across almost all disciplines: business, construction management, design, housing and merchandising, engineering, entomology, geology, history, sociology, and zoology. Conducting face to face interviews allowed us to connect with each faculty member on a personal level, which is not necessarily represented in the interview notes themselves, but was readily apparent during our conversations.

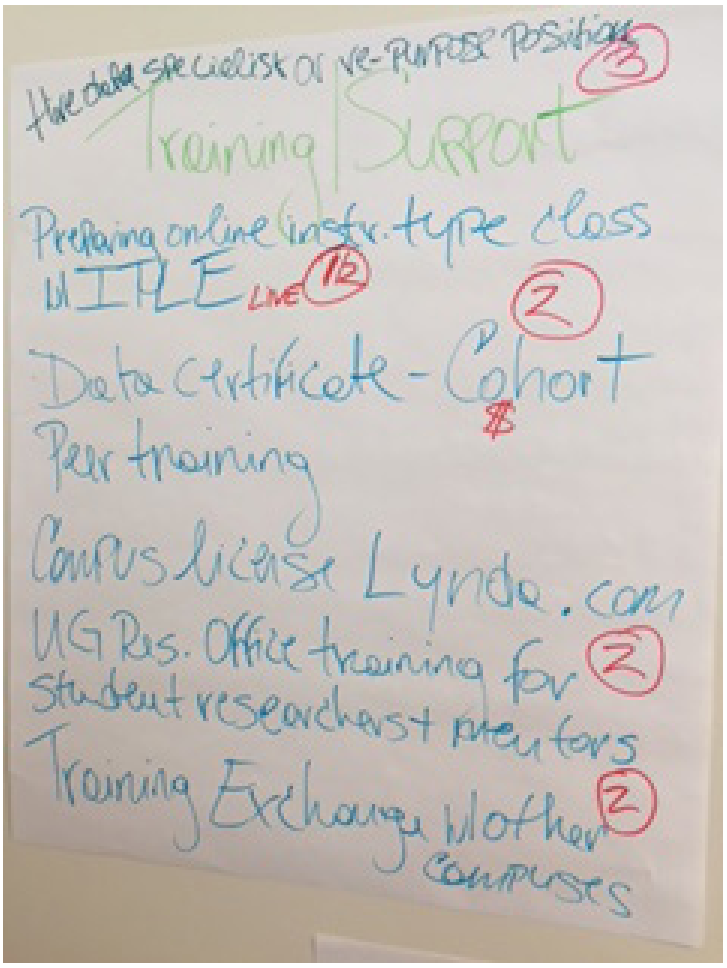
The next two steps involved ideation and prototyping to determine how we would define challenges and brainstorm solutions. We split up the faculty responses among the liaisons, the associate dean, and the head of the liaison program. Each person was responsible for examining responses on the spreadsheet and summarizing the results that were then recorded in a Google doc for ease of access. After that second-level triage was done, we met as a group and wrote each perceived challenge from the summary response onto a different Post-it note. Once this round of analysis was over, we quickly categorized our ideas (shown in the picture below) and realized that there were several commonalities.

During a separate meeting, we followed the steps to generate and narrow down solutions as part of the ideation phase. Individually, we wrote ideas prior to a broader group discussion. Subsequently, we categorized each set into broadly grouped themes based on the following instructions:

1. Re-frame challenges into “How might we...” questions.
2. Draw and be visual.
3. Keep all ideas on the table at first.
4. Switch to a new brainstorm question every fifteen to twenty minutes.
5. Set a goal for how many ideas you want to generate in total.
6. Look at each idea:
    a. What is at the core of your idea: what gets you excited about it? What is the most important value for your audience? What is the real need that this is addressing?
    b. Make a list of all the challenges and barriers you are facing with your idea. What are you missing? Who would oppose the idea? What will be most difficult to overcome?
    c. Think of additional possibilities that might satisfy the needs your idea responds to. Brainstorm how you might address some of these challenges. For example: how might we raise money to acquire furniture for a certain space?
    d. Discuss how you can change your concept based on your new ideas. How can you address the need differently? How can you work around the constraints you are facing?
    e. Let go of ideas that feel too difficult to implement, or that you are not excited about.

While we may not have uncovered completely original solutions, this sequence was important for our brainstorming process on a number of levels. First, it allowed us to engage in both individual and shared thinking that often does not occur, especially as part of a group project where discussion quickly ensues without time for reflection.Second, we were able to define the elements that were of most importance and interest to our researchers regardless of what we already knew about other trends. Third, we were able to move from random ideas to cohesive action items fairly quickly thanks to our pre-identified categories which allowed us to keep the conversation moving forward and sustain momentum. Finally, we identified internal training and professional development needs that will allow liaison librarians to collaborate with faculty in an informed and proactive manner.

This is an example of how we captured these ideas:



Challenges

We grouped challenges into the following broad categories in order to allow us to easily identify patterns and areas of similarities in terms of needs or perceived knowledge gaps:

- Awareness
  - Knowledge gap about data management plan elements and existing campus (library) services that can support them (if available)
    - Not aware of library support services (x4)
    - Lack of awareness of what a DMP is (x4)
    - Mostly sciences use DMP
- Data sharing
  - Knowledge gap about the ethical repurposing and sharing of datasets
  - Knowledge gap about mechanisms and processes of sharing data (i.e., via repositories)
    - Ethical use of data sources (x3)
    - Confidentiality (x3)
- Data storage
  - Lack of long-term archiving and storage solutions and processes
  - Lack of systematic storage of data methods and processes during projects; mostly stored on external hard drives, USB drives, and lab computers
    - External hard drives (x6)
    - Store data in multiple places, not necessarily coordinated
    - Lack of centralized storage
    - What to do with old data?
    - Data storage needs improvement
- Data organization/manipulation
  - Knowledge gap in understanding what metadata is and how it can be applied to their data
  - Lack of usage of data organization standards (i.e., file naming conventions, Readme files, etc.)

        - Many have their own specific system which may or may not be documented and shared
        - Confusing metadata with keywords (i.e., like for journal article abstracts)
- Training and support
    - Lack of coordinated campus efforts to provide centralized training beyond small-scale efforts (i.e., one-credit course, one-off workshops)
    - Need training on how to write a DMP
    - Need training for themselves (and students) in data manipulation (software carpentry), data information literacy, data organization
        - Many do not have tech support (x2)
        - Need basic training on metadata (x2)
        - Data information literacy
        - Software carpentry/coding
        - Lack of training for graduate students
- Data types/size
    - Knowledge gap regarding the types of storage, organization, manipulation options for different data types
        - Tabular data (x2)
        - Digital images (x3)
        - Large amounts of quantitative data

Solutions and Testing

As a result of the design thinking sessions, the planning group identified several action items to test out as prototype partnerships, services, and programming opportunities:

- Priority Level 1
    - Link to existing datasets and repositories from library website
    - See what existing training videos and learning objects we can borrow
    - Join Center for Open Science and create an OSU landing page
    - Develop a library/institutional policy for ShareOK (OSU's institutional repository) to enable faculty to upload and store datasets to comply with federal grant requirements as a way to fill a much-needed gap for small to medium storage and discoverability
    - Create a campus-wide research data committee that would engage campus partners in the following activities:
        - Consulting and access to a referral network both within the libraries and across the university of dedicated experts
        - Centralize research data services and resources
        - Offer workshops and training
        - Ongoing researcher engagement and needs assessment
        - Define cyberinfrastructure planning and support
        - Offer programming and events such as a data forum
- Priority Level 2
    - Develop a data certificate in conjunction with a cohort-based program—possibly offer stipends for faculty to participate
    - Develop a training exchange program with other institutions
    - Provide training for both graduate and undergraduate students and faculty mentors via Office of Undergraduate Research and in collaboration with the Graduate College
- Priority Level 3
    - Hire a data specialist position
    - Integrate data information literacy as part of concurrent enrollment course and explore offerings throughout the curriculum for both graduate and undergraduate students
    - Coordinate an OSU data forum to bring together researchers on campus
    - Coordinate a data conference for regional/national programming
    - Create an OSU data center to store all types and sizes of data
    - Obtain an institutional membership to Globus

The library has already approached the OSU High Performance Computing Center as well as the Center for Strategic Proposal Development and taken the lead in offering pilot-type services in the form of a research data services website (http://www.library.okstate.edu/research-support/research-data-services/) and some workshops (http://info.library.okstate.edu/workshops), so we decided to target at least one item from each priority level as a way to make progress at each level of complexity and planning. To date we are in the process of:

1. refining our liaison outreach efforts to include on-demand workshops in writing data management plans, measuring research impact, and specific programming languages in addition to more formal Software Carpentry offerings;
2. identifying a small cohort of faculty to assist us in piloting the depositing of datasets into our institutional repository and developing researcher profiles that are connected with Altmetric;

3. developing a workshop series for graduate students; and
4. beginning campus-wide conversations to form the research data committee in collaboration with the Office of the Vice President for Research.

In terms of training for librarians, we have developed several avenues of action that will assist us in developing our own skill set and delivering training for faculty in a consistent and strategic manner:

1. We developed an outreach toolkit for data consultations consisting of general information on how to initiate contact, build rapport, and questions to ask during a face-to-face meeting. For a data management consultation, we referred to the the article "Suddenly... I'm Consulting on Data Management Plans! Data Management Plan Consultant Checklist,"[12] which has a helpful step-by-step process for walking faculty through the various elements of developing a data management plan. Finally, we asked that all of our liaisons document their meetings to be added to our annual impact spreadsheet (and to assist with evaluations) and note any follow-up items that may need to be continued.
2. We also created a lesson plan and handout set that can be tailored to specific disciplinary or departmental needs when liaisons receive requests for workshops and presentations: http://info.library.okstate.edu/c.php?g=401548&p=3595256. In addition, we have created a dynamic DMP template that blends generic language with specific items inserted based on the researcher's responses, such as repository choices. This allows participants to fill out the form as the workshop unfolds and leave with a solid first draft of their plan: http://forms.library.okstate.edu/machform/view.php?id=80500.

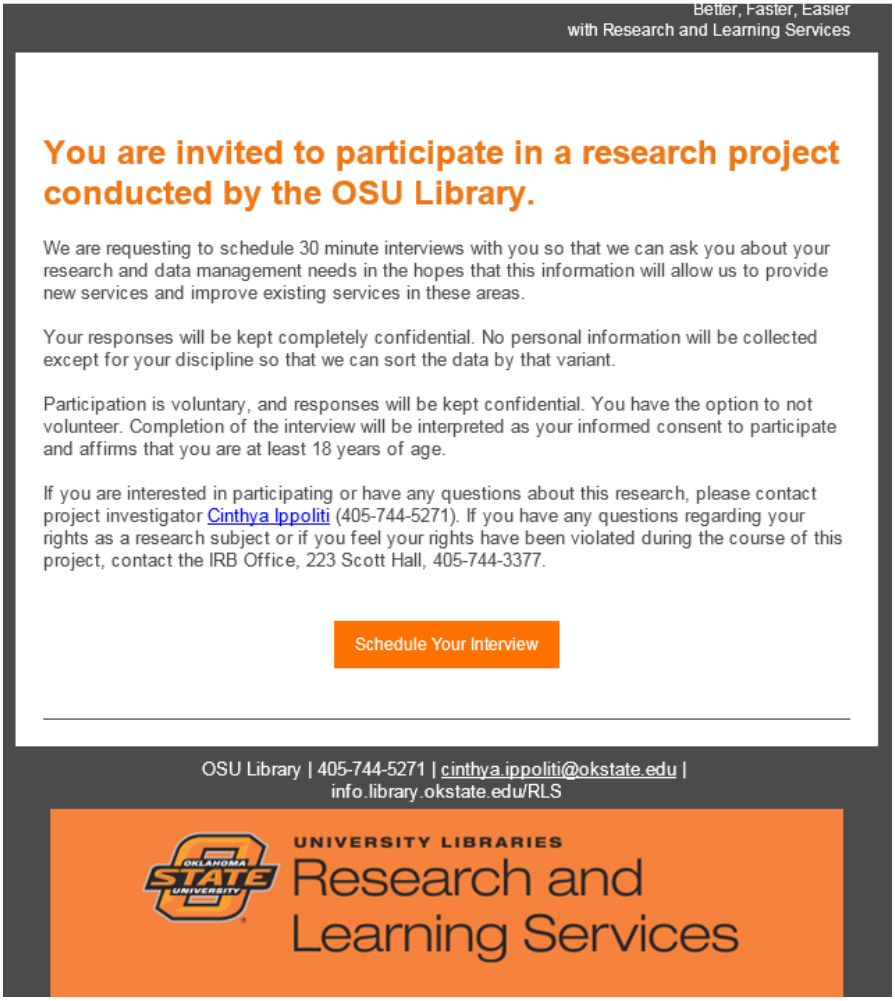
Limitations and lessons learned

Overall, the process went fairly smoothly, with no major scheduling or data analysis problems, but things can always be improved. We obviously reached a small number of faculty out of the total who could have participated, and we realize that their responses might not be representative of the entire faculty population at OSU. They do however closely align with those presented in other similar studies, so we feel reasonably confident we received accurate data upon which to base our planning.

We decided against recording the interviews for two main reasons. We wanted to encourage as much participation as possible, and by extension make this process as simple as we could, and we felt that if we added the element of recording, faculty would not be as willing to talk with us. In addition, we did not have the staff time that would be needed to transcribe and process each interview. In keeping with the design thinking theme, we wanted to let the faculty guide the conversation and we allowed for a more flexible and organic approach using the interview questions as reference points rather than strict guidelines. Given the already rich level of information we gathered, we are not sure that having transcripts of what was discussed would have yielded more meaningful data than we received, as the goal of design thinking is to look at broad patterns rather than focus on each detail.

Each interview took longer than the expected 30 minutes, largely due to faculty going into more detail about certain aspects of their research than we had anticipated, which yielded a deeper level of understanding about their activities, but which also made back-to-back interviews difficult to schedule. About two interviews per day was optimal, and we found that even doing one additional interview caused fatigue on the part of the interviewers.

Although the initial recruitment message came from the associate dean in the form of an e-mail (see below), it was not until the liaisons sent the same message that faculty began responding. This points to the importance of the way in which the information is distributed and to the true power of the relationships librarians have with their departments.



An added benefit of these discussions was developing relationships with faculty who had largely never met their library liaison, even for those who were not entirely new to the institution. We also raised awareness of the new services we are thinking of offering (based on national trends occurring at other libraries) and received validation that these would indeed be useful.

Closing the loop on a project of this nature is vital. Rather than sending out a thank you note with a summary of the results, we opted to host an in-person presentation where we invited all of the participants along with the liaison librarians and representatives from the Office of the Vice President for Research. This allowed us to showcase this more personalized approach, continue to further build upon the initial contact we made, and show a direct response to the needs that were identified in our conversations.

Conclusion

Data management practices and policies will evolve, and libraries must do the same in order to capitalize on the partnerships and collaborative activities that naturally arise from these various activities. Libraries have quickly addressed the challenges of data management by providing services and resources based on researcher needs that are similar across institutions of varying types and sizes. We must therefore be able to respond and provide guidance for faculty who are working in this arena by thinking well outside the proverbial box and envisioning policies for data plans, project management, and publication models that are still in their beginning stages but which will shape the landscape in the years to come.

Endnotes

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Assessing the Digital Humanities Working Group Projects at the University of Florida

Laura I. Spears and Laurie N. Taylor
University of Florida, USA

Introduction

Academic libraries and teaching departments sometimes treat digital humanities (DH) as radically new. While DH is markedly innovative in terms of collaborative practices and methods, it is also fundamentally rooted in the humanities and intricately connected to core activities by librarians, especially for collaboration.

At the University of Florida (UF), the Smathers Libraries leveraged the library digital collections—with rich technical features and content, and a robust underlying infrastructure—to examine its role in the creation of the necessary scholarly cyberinfrastructure that best supports a DH collaborative community. This paper foregrounds two projects that emerged, in part, from efforts of the growing UF Digital Humanities Working Group (DHWG), begun in 2011 and currently comprising over 300 members. This paper assesses the project deliverables of two initiatives to examine their contribution to the larger DH program goals to grow the DH community of practice (CoP).

In developing a CoP, UF follows the *first-of-kind* development: "While requests for customized services cannot typically be accommodated, service teams may consider strategically undertaking a special project if it is likely to result in a first-of-a-kind, rather than one-of-a-kind, solution, which might eventually be rolled out more widely."[1] These projects are intended to examine the DH CoP needs and align "library collections...that have been developed around academic structures that tend to obscure connections between fields of research"[2] to better use digital resources and support full socio-technical (people, policies, communities, technologies) integration. The UF Libraries have conducted activities that further the efforts of multiple interdisciplinary research groups tied to digital collections, including collaborations with teaching faculty across various academic units.

Purpose

This paper describes two collaborative DH projects, the *Developing Librarian Pilot Training Project* (DLPTP)[3] and the *Digital Humanities Bootcamp* (DH Bootcamp).[4] These efforts aimed to enhance Smathers Libraries' (Libraries) growing digital collections and related activities by targeting multiple stakeholders—instruction librarians, student users, campus-wide faculty and administrators. The DLPTP featured a librarian pilot training project designed to "re-skill" librarians increasingly required to provide digital humanities services; the DH Bootcamp's objective was to increase awareness, technical skills, and develop a community of practice with campus-wide humanities researchers.

Problem

While the Libraries have developed library digital collections to create the necessary scholarly cyberinfrastructure to support the DH collaborative community, understanding of and use of these resources remains less than ideal. As DH is lauded as a demonstration of interdisciplinarity and rich collaborative potential, outreach and training are still required to improve understanding and stimulate use.

Research Questions

The two projects aimed to create, conduct and document collaboration in DH activities. This paper seeks to answer three research questions about the projects:

1. In what ways were activities structured that assess capacity building in DH outreach projects?
2. What formative assessment instruments and activities successfully elicit and reinforce participation in DH workshops/trainings?
3. Will the DHWG activities enable an increase in interdisciplinary mentoring relationships and enable increasingly diverse proposals submitted to the UF humanities granting organizations?

This synthesis of the DH programs and assessment of the deliverables builds upon initiatives such as Turin's examination of pedagogical interventions[5] and various programmatic assessments of DH incubation at the intersection of academic libraries and digital humanities that describe efforts to develop the community of practice for growing DH initiatives.[6] In consideration of these analyses, this paper describes assessment activities conducted in two recent UF DH initiatives, evaluates their application and suggests programmatic or project-based components that were left unscrutinized by the assessment activities.

Selected Relevant Literature

The Colorado University at Boulder's (CU-Boulder) programmatic case study lays out the state of DH at CU-Boulder, presenting a campus profile, needs assessment, and model adoption for developing and sustaining a program.[7] Another article highlights the assessment considerations of a pedagogical DH initiative.[8]

In the CU-Boulder case, the authors describe an organic approach—initiated within the library's various specialist librarians who provide such services as data management, scholarly communications, metadata, and preservation and archiving, among others—succeeding as it organized and centralized library resources to support the campus community's digital humanities activities.[9] CU-Boulder established a task force that examined the university's environment and asked how to assess the extent to which the libraries cohesively harnessed the obvious and existing resources to facilitate the efforts of DH.

Issues for assessment emerging from the CU-Boulder findings include:

- the design of cross-campus partnerships that support interdisciplinary collaboration;
- how to support a collaborative graduate student network;
- how digital modalities best support methodologically diverse stakeholders including faculty and graduate students;
- how instruction currently and could potentially incorporate the transformative power of DH into pedagogy;
- how workshops remove ambivalence and anxiety around learning new skill sets; and
- the barriers that challenge faculty conducting or student participation in DH activities.

In contrast, Turin describes using DH as a pedagogical approach with the purpose of examining underused collections in the Yale University library. In this experimental course, Turin employed a hands-on approach using student effort to develop metadata for a digital collection. The students "digitally mediated"[10] Himalayan materials using an object-based teaching and learning platform.

Turin's model looked at the:

- tools that develop digital scholarship;
- interaction with socially-relevant topics;
- culturally engaging activities;
- balancing tension between tool and content; and
- sustainability of outcomes and impact for the academic community.

Turin's approach asks the poignant questions that focus on how the digital resource, the user-centric services and outreach were intertwined, and he questioned the pedagogical concerns of whether DH can deliver learning outcomes.

These approaches demonstrate ways to assess programs and projects as DH initiatives increase. The next section outlines the assessments conducted in each of the projects and analyzes their effectiveness in gauging the usefulness of the DH activities.

Background

Developing Librarian Pilot Training Project

The Digital Humanities Library Group (DHLG) was established in January 2014 as an interest group, discussion forum, and training venue. In 2015, faculty from multiple departments held discussions resulting in the creation of a graduate certificate program in the digital humanities. To support these efforts, the DHLG led development on a scholar's lab to support DH activities. The group estimated that librarians required new skills and methods to support the continuing growth of DH at UF.

The DHLG was awarded almost $5,000 for the DLTPT to conduct an 11-month intensive training for librarians in digital humanities activities using the Grimm Brothers Digital Collection.[11] Activities included learning collaborative scholarship practices, using digital humanities tools, GIS/Data visualization, TEI (Text Encoding Initiative), and metadata to collaboratively create an online exhibit. The goals of the project were to build a network of DH practitioners and consultants within the

Smathers Libraries; develop the skills of librarians with DH tools resulting in greater familiarity and competencies in data visualization, text encoding, online portfolio development, project design and project management; and add value to the Grimm Brothers collection. The grant supported visiting experts from Columbia, Carnegie Mellon, and Brown University. The development of the community was the core goal, with the activities a means for this development.

Deliverables of the DLPTP include:
- creation of an online exhibit with digital humanities components including small-scale data visualization;
- use of TEI code to enhance selected texts and encourage scholarly engagement; and
- creation of a blog to document the group's progress.

Longer-term outcomes include the use of the project as a case study for future collaborative projects and publication of peer-reviewed articles outlining the project's efforts.

DH Bootcamp

A recent initiative of the DHWG proposed to engage up to 60 first-time DH practitioners in a two-day seminar and workshop. The seminar portion provided introductory digital skills training and shared exemplar projects demonstrating new technologies, potential collaborative approaches, and outcomes assessment. Seminar presentations included an overview of scholars in "publicly engaged scholarship;" the history of and culture wars navigated with digital humanities frameworks; the advantages of digitally-native forms; and lessons to be learned from 19th century scholars about managing information.

Workshops focused on small-group interactions with diverse UF campus representation. Topics included 3-D printing and maker activities; text mining and visualization; digital collection-oriented usability testing; an introduction to TEI; GIS mapping; video creation; and "grantsmanship."

Participants were organized in small workgroups with a mix of disciplines. The Bootcamp culminated in lightning round presentations by workgroups and a post-Bootcamp reflective individual video. Benefits included heightened awareness and recognition across campus of the value of partnerships, network relationships, and the current scope of UF digital scholarship. As with the DLPTP, CoP development was the core goal of these activities.

The Bootcamp framework required both team and individual outputs including workshop attendance reporting to the team and the lightning round presentation; individual contributions included the surveys, the post-event reflective video and the online bio.

Methods Used to Gather Assessment

The purpose of examining these projects is to derive best practices in implementing DH emergent pedagogies into projects, seminars, and workshops. The two projects proposed to create, conduct, and document collaboration and both formatively and summatively assess project activities and deliverables.

Findings

UF librarians undertook new DH activities to fundamentally enrich and improve existing work including collection development, library scholarly councils, and collaboration among libraries for print and digital collections, outreach, and instruction. The project efforts were focused both inward, providing training to support new skill sets, and outward to share UF campus-wide DH activities and networks at UF and with external communities. To support overall measures and methods for assessment, the first DLPTP and Bootcamp trainings were on project charters and project management.

Both initiatives proposed formal, structured assessments that included formative and summative methods. Table 1 identifies measures that were planned or emerged, and maps activities to the planned and emerging assessments.

Project: Developing Librarian DH Pilot Training	**Proposed Deliverables**	**Actual Deliverables**	**Proposed Assessment Measure**	**Assessment Outcome**
	Short-Medium Term			
	Brothers Grimm online exhibit	Brothers Grimm online exhibit	None Proposed	Community of practice (CoP)
	TEI code to enhance selected texts	TEI coded texts	None Proposed	CoP; librarians engaged in and teaching TEI
	Blog documenting group progress	Blog entries on Tumblr and Wordpress	None Proposed	CoP
	Long Term			
	Use of the project as a case study for future collaborative projects	Completion of the project charter; adapted and used in subsequent projects	Interim group meeting to assess project charter	CoP; resulted in DH Bootcamp and increased participation in Gainesville THATCamp
	Not proposed but emerged in collaboration with multiple campus units	Development of 2-day DH Bootcamp	See program assessments below	CoP; creation of the DH Bootcamp
	Not proposed but emerged in collaboration with multiple campus units	Proposed graduate certificate in Digital Humanities	Established fall 2015	CoP; 24 students enrolled in graduate certificate
	Publication of peer-reviewed articles	Presentations proposed and delivered at conference	None planned	This article to assess DH deliverables
	Build network of DH practitioners and consultants	Changed activities for library staff, new resources and positions including scholars studio and studio facilitator	Participants' self-assessment surveys	DH Bootcamp; DH Working Group; ongoing CoP development
Program: DH Bootcamp	**Proposed Deliverables**	**Actual Deliverables**	**Proposed Assessment Measure**	**Assessment Outcome**
	Short-medium term			
	Team members attend workshops	Increased technical skills and collaborative project experiences	Post-workshop survey but did not assess attendance	N/A

	Teams complete lightning round presentations	Teams create slides for presentations	Teams post slides in the IR	None to assess; no team posted slides
	Team members complete pre- and post-workshop surveys	40 pre-surveys completed; 22 post-surveys completed	% of participants who complete these surveys	22 of 50 participants responded, a 44% response rate
	Team members complete post-workshop 3-minute reflective video	None submitted	% of participants who submit a video	0% response rate
	Team members create and share online brief bio	Team members create and share online brief bio	% of participants who created online bios	48.1% of participants completed bio
	Long Term			
	Increase in CHPS proposals for team-taught course grants	Team-taught courses proposed to CHPS	% of team-taught courses proposed to CHPS by Jan 2017	% of team-taught courses taught in fall 2017
	UF heightened awareness of value of DH networks	Enlarged CoP	None planned	None planned
	Increased DH activities across campus	DH presentations by participants at THATCamp-Gainesville	None planned	None planned
	Recognition of the current scope of digital scholarship	DH Publications	DH Publications; increase on score in post-workshop survey	Multiple publications completed/in progress.
	New mentoring relationships established at the Bootcamp	N/A	Post-workshop survey	Generation of this article; Libraries' Graduate Internship Program

Table 1 displays the assessments mapped to the activity's proposed deliverables, actual deliverables, the assessment proposed, and the outcome of the assessment. Each project's charter and grant proposal was examined to identify the language for both explicit and implied deliverables and projected assessments. These findings demonstrate the anticipated outcomes as well as unexpected and unexamined deliverables and outcomes.

For the DLTLP, three activities were proposed or conducted that produced short-term deliverables from two of these, including an online exhibit and TEI-enhanced texts; the third activity that was to result in a group blog was not realized with multiple tools utilized during the project. No assessments were proposed for or resulted from these activities.

For the longer term objectives, deliverables included expanded library engagement with the DHWG; focus groups for brainstorming ideas to create infrastructure and relationships; and group meetings to formatively assess the group's performance in carrying out the project charter. Two other long-term proposed deliverables include submission of peer-reviewed publications and an expanding, formal network of DH practitioners and consultants. Both of these deliverables were exceeded, especially the latter which has seen additional librarians hired for DH support roles. This article, examining the assessment of DH initiatives, serves as an additional

step in documenting research and study output, as an unplanned assessment of the peer-review publication deliverable.

Two other deliverables also emerged from the DLPTP, including the creation of the DH Bootcamp. Additionally, a graduate certificate in DH was established, with an initial seven admits to the first year of the program; currently, 24 students overall have applied for admission.

The second portion of Table 1 provides a similar listing of the DH Bootcamp's proposed and actual deliverables, and proposed assessment and assessment outcomes. The Bootcamp assessments focused on skill building, with pre- and post-workshop surveys designed to examine both the participant's familiarity and comfort with technical skills and to understand the extent of the DH environment for the participant. Other formative activities designed to assess the impact of the workshop included submission of brief biographies for inclusion on the DHWG website, lightning round presentations by the teams, Power Points created by the teams, and a post-workshop reflective video by each participant.

Five long-term outcomes were expressed in the program grant proposal and project charter. Of the five, only four were proposed. Of these four, only two were associated with proposed outcomes. One outcome that was not proposed in the materials did have a mechanism for assessment in the post-survey (the mentoring relationships).

Discussion

Analysis of Assessments Used

In the DLPTP trainings, pre-training and post-training surveys were accompanied by focus group interviews to assess the effectiveness of training. Overall scores (means based on five-point Likert scale) indicate improvement in knowledge of resources, but not necessarily competency in any. To understand level of competency, assessment may have been strengthened by comparisons of skills and perceptions, pre-training and post-training tests, with controls for variables such as discipline and tenure.

Both projects proposed digital deliverables in support of process and community development changes; assessment of the products is not within the scope of this study. For example, the DLTLP delivered TEI-encoded texts, but only the efforts were assessed but not the products.

Formative and Summative Assessment Goals

The formative and summative assessments for the DLPTP contributed to the discussion and planning of the DH Bootcamp, based on recognition of a broader community desire for DH tools, resources, and infrastructure. Conversely, the DH Bootcamp approached the two-day workshop with aggressive aspirations for pedagogical success using participant digital assignments and orientation for many first-time DH participants with featured concept-building presentations. While the qualitative content of the presentations was assured based on the speakers' expertise, the expectation of deliverables from first-time participants with unknown technical skills and limited DH exposure could have been more successful if the participants were provided support within the workshop time period to complete technical tasks.

Pedagogical Outcomes

The pedagogical tools used with the DLPTP may have benefited the DH Bootcamp in eliciting participation, given the participant's level of DH experience. However, the pre- and post-surveys provided understanding of the extent to which participants perceive the digital transformation of university archives, museums and libraries from "dusty, quiet, and mostly inanimate places where objects are preserved for posterity"[12] to innovative, desirable, and pedagogically possible communities for their engagement.

The DH Bootcamp's objectives were suitable for a program-level initiative, with emphasis on DH partnership, community, collaboration and support infrastructure concepts being presented. However, assessment requiring technical skills underestimated the ambivalence and anxiety that surrounds learning new skill sets and reflective exercises focused on little-understood DH concepts. In addition, the DH Bootcamp required a full two-day time commitment from individuals in demanding leadership roles and competed with an activity by UF's new president. Therefore, participants missed some assessment activities scheduled for the conclusion of the workshop.

Conclusion

Assessment and evaluation of DH efforts may benefit from the same type of two-pronged approach

pursued by Columbia University, in which the skills and knowledge development as well as the CoP outcomes were examined.[13] Thus, future UFDH assessment efforts will benefit by developing a structured yet iterative assessment plan, conducted systematically for each projected deliverable and outcome and for examining the engagement of both librarians and scholars in projects. Using tested frameworks supports reliability and offers comparative methodological investigation as well as an opportunity to examine differences in an unfolding disciplinary approach.

A more comprehensive comparison of DH assessment using the CU-Boulder DH data-driven assessment methods would look at the extent to which libraries cohesively harness the obvious and existing resources that can facilitate the efforts of DH but also extend the examination to integration with campus-wide needs such as cross-campus partnerships and benefits for graduate students.[14] Because the DH Bootcamp focused on conceptual presentations, even with the technical talks embedded in the workshops, the assessments should have remained focused on the larger, conceptual issues. Finally, to assure assessments that more fully capture examination of the objectives and promised deliverables, modeling and mapping strategies are recommended to provide clarity and transparency for administrators and enable stronger dissemination of results.

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11. Suzan Alteri, "Forging a Collaborative Structure for Sustaining Scholarly Access to the Baldwin Library for Historical Children's Literature," *Institutional Repository, George A. Smathers Libraries, University of Florida*, Mini-Grant Proposal (Gainesville, FL: University of Florida, 2013), http://ufdc.ufl.edu/IR00003577/00001/.

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Lessons from the 2015 UCSC Instance of the Ithaka S+R Student Survey

Greg Careaga
University of California, Santa Cruz, USA

In spring 2015, the UC Santa Cruz University Library conducted the Ithaka S+R Undergraduate Student Survey plus the optional Library Space Planning module. The survey was targeted to a population of 15,694 enrolled adult undergraduate students, with 1,766 students completing the instrument. The university library used the results to examine how public space programming met our students' needs and to help prepare for a renovation of our Science and Engineering Library.

Background

The university library consists of two facilities: McHenry Library and the Science and Engineering Library. McHenry Library underwent an 80,000 square foot addition, seismic retrofit, and complete renovation project that concluded in 2011. The Science and Engineering Library opened in 1991 and requires renovation to meet current and future capacity and program needs of the campus.

The library had worked with Ithaka S+R twice in the previous year. We conducted the Local Faculty Survey in the spring of 2014 and collaborated on a cognitive interview-based field test of the in-development Library Space Planning module for the Undergraduate Student Survey in the fall.

Methodology

We brought in our Office of Institutional Research, Assessment, and Policy Studies (IRAPS) to help us implement the full survey. IRAPS was accustomed to doing outreach for the biennial University of California Undergraduate Experience Survey and had useful strategies for raising awareness and driving response rate. They also had access to the university's academic information system and could provide us with more comprehensive and reliable demographic data than could be derived from student self-reporting in the survey's demographics module. The only demographic questions we included in the survey were those about gender and on-campus or off-campus residence. We liked that Ithaka S+R's gender question allowed students to self-identify with non-binary identities and believed that student self-reporting about current living arrangements would be more accurate than campus data.

Ithaka S+R had good experience using the Qualtrics platform to do e-mail outreach to students using customized links. IRAPS preferred using a generic link combined with aggressive marketing to raise awareness and response. We settled on a hybrid approach and launched the survey on April 6, 2015. Customized links went out via e-mail over the university librarian's signature. Generic links were available on the library web site and library social media outlets. The generic link differed in that students had to enter their campus identification numbers to start the survey.

We had hoped to run the survey for three weeks as we had the year before for the faculty survey. By the end of April, our response rate was only about 5 percent. We extended the survey until the end of the quarter on June 5, but interrupted advertising and outreach during alumni weekend and during student elections.

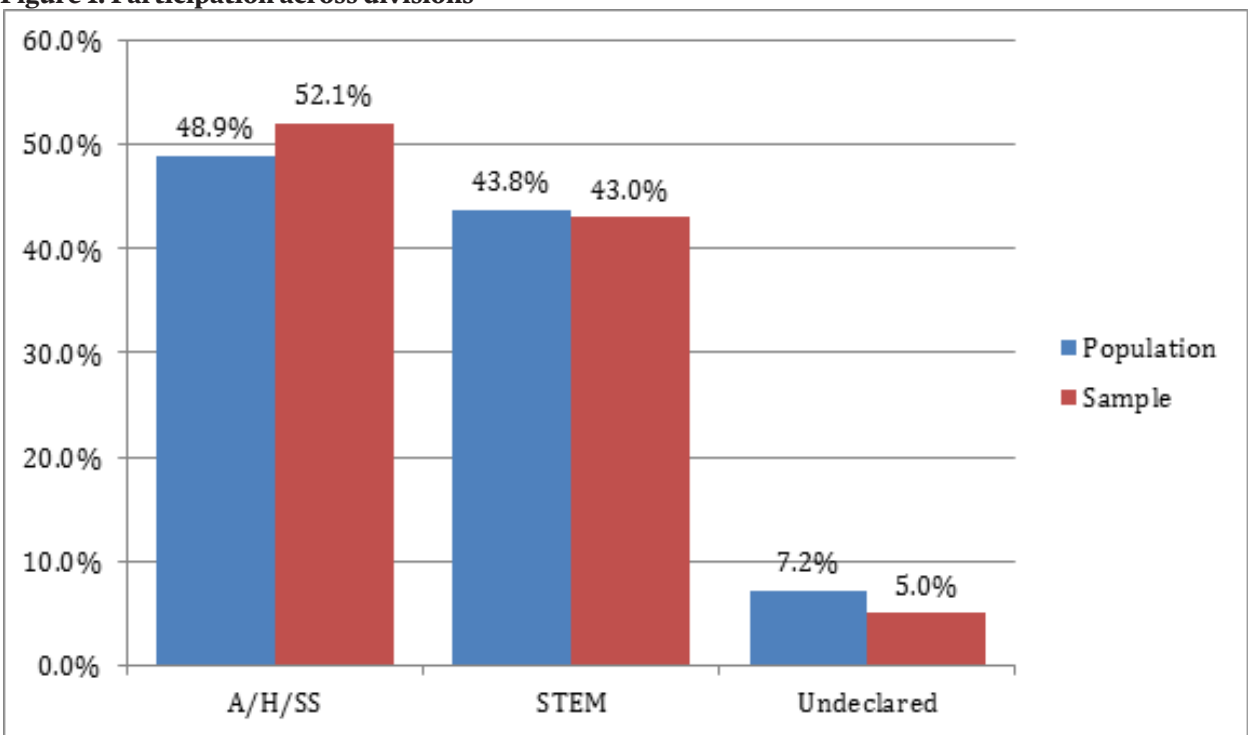
Most of the survey responses came from the direct e-mail appeals. Fifteen hundred twenty-three completions came from the custom links and 243 came from the generic links. The hybrid approach was not an intended use case for the Qualtrics software. Scheduled e-mail reminders to students who had not completed the survey were inadvertently sent to students who had completed it via the generic link. This occasioned several complaints after the first reminder e-mail, but Ithaka S+R quickly diagnosed the cause and implemented a manual fix. Eleven percent of eligible students completed the survey by June 5, 2015.

Outcomes

The university library is in the early stages of planning a renovation of the Science and Engineering Library and we hoped to see a good representation of science, technology, engineering, and math (STEM) students in the survey results.

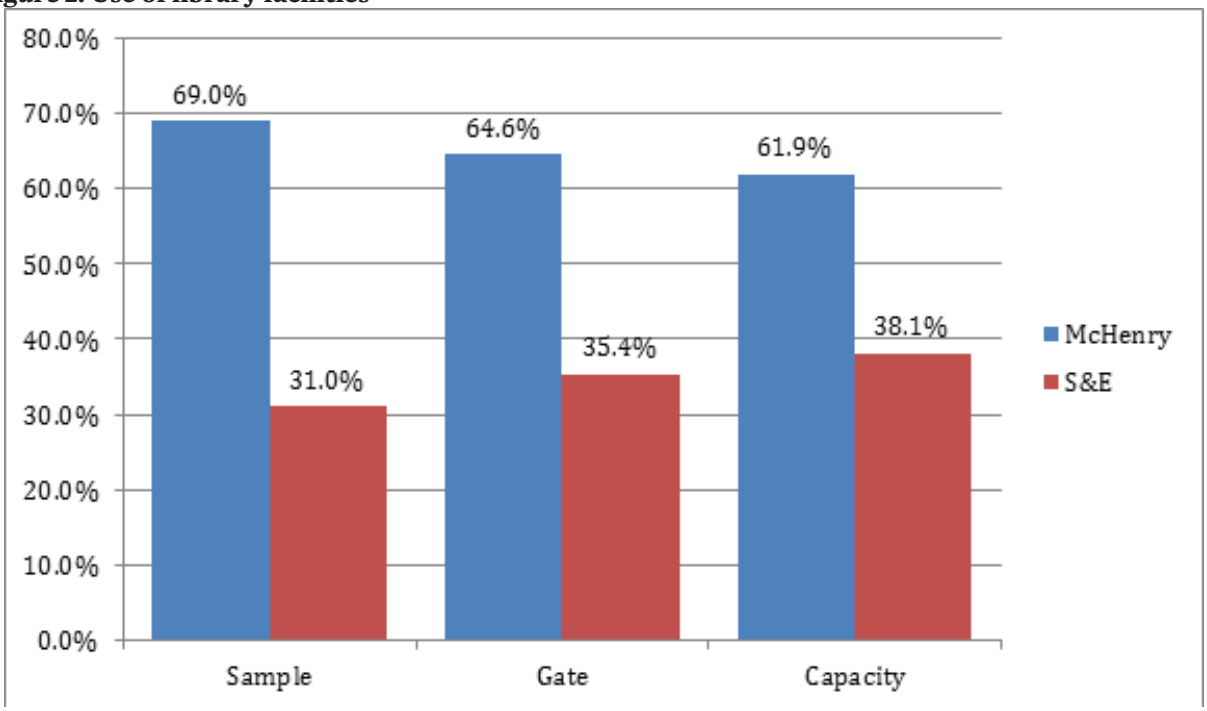
The sample well represented our arts, humanities, and social sciences (A/H/SS) students as well as our STEM students (Figure 1).

Figure 1. Participation across divisions



The renovated McHenry Library is the newer and larger library with more services. We were curious to know how many students picked each facility as their "go-to" library. Question 13 in the *role of the library* module asked, "Which of the following campus library buildings do you visit most often?" Sixty-nine percent chose McHenry Library and only 31 percent chose S&E. This is out of proportion to our academic demographics but is fairly consistent with building capacity and use. Of the library's 2,260 seats 1,400 are at McHenry Library. Sixty-five percent of the most recent year's gate count was at McHenry (689,080), while 35 percent was at S&E (377,655) (Figure 2).

Figure 2. Use of library facilities



Questions 25 and 26 in the *library space planning* module measured students' perception of personal safety while traveling to or from the libraries. Students expressed a high degree of confidence in their safety during the daylight hours and less at night (Figure 3). The change in the perception of safety was greater for students who did not identify as male and it was greater for McHenry users than it was for S&E users (Figures 4 and 5).

Figure 3. Perception of safety to/from both libraries by time of day

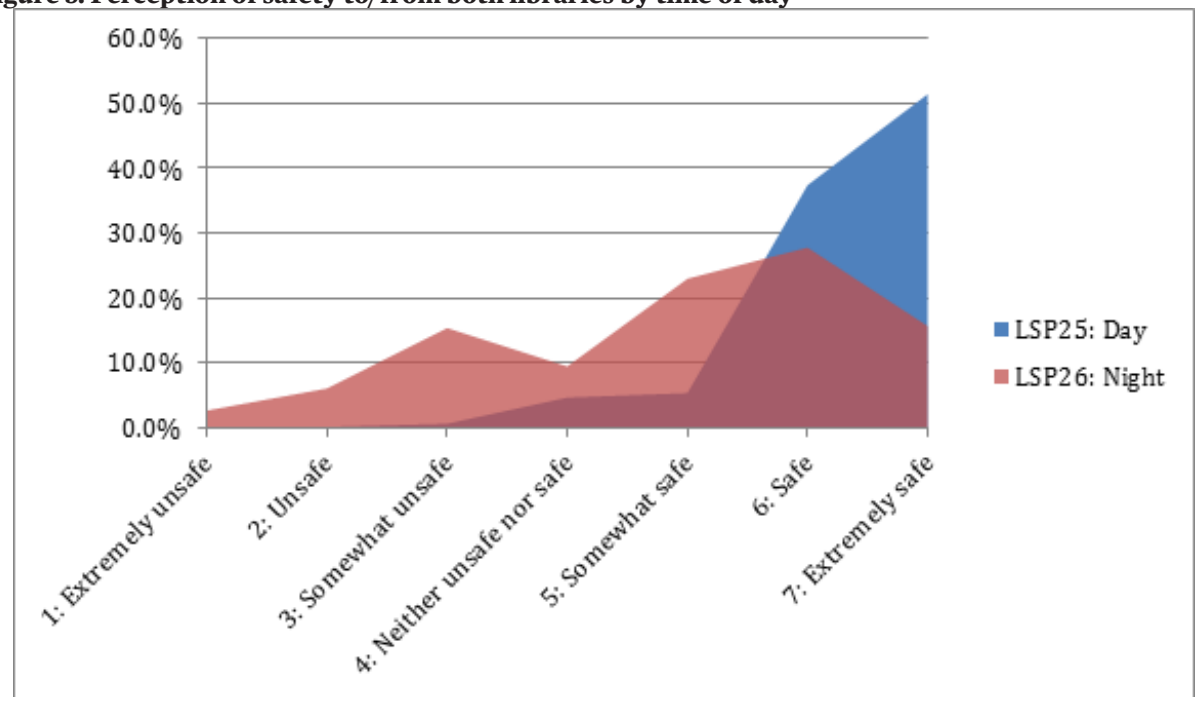


Figure 4. Mean perception of safety to/from McHenry by gender and time of day

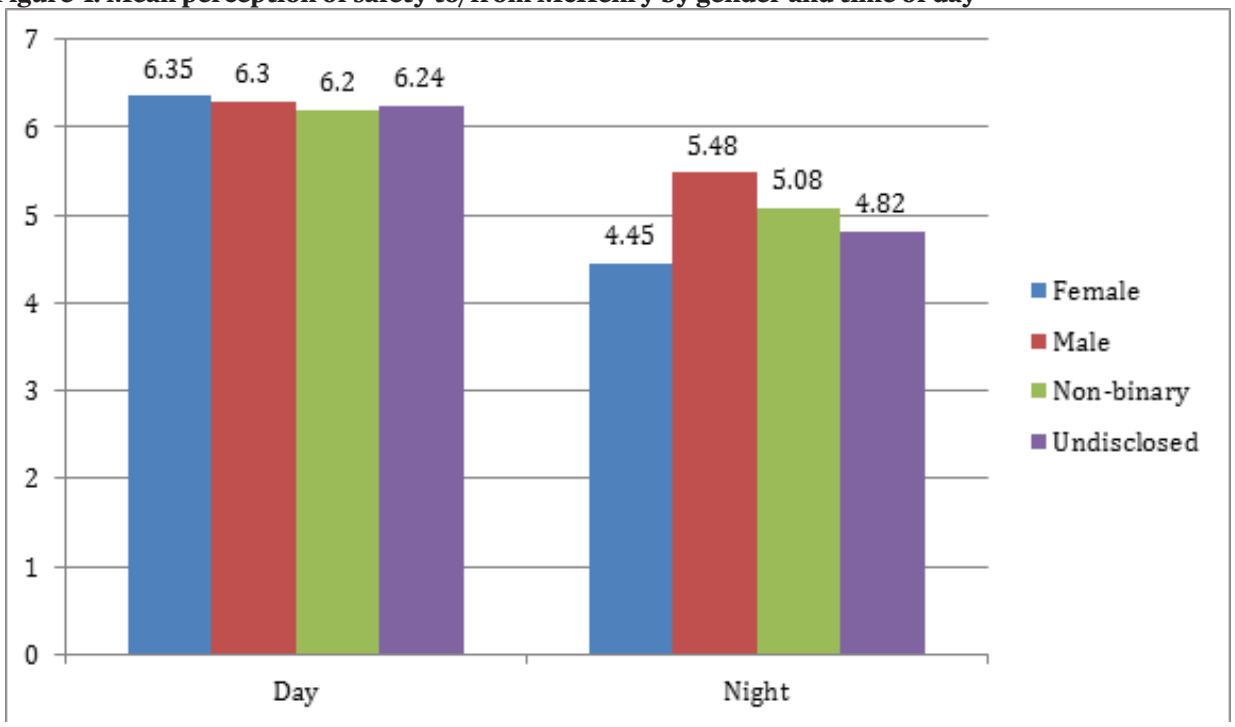
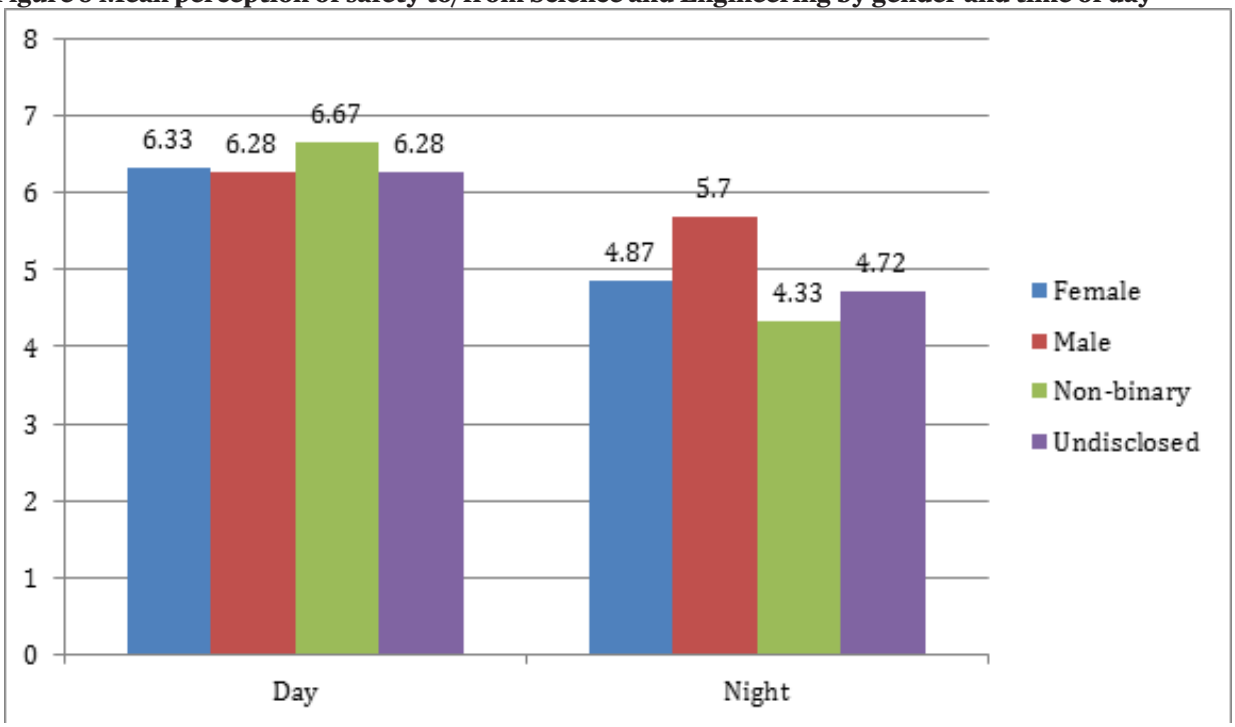


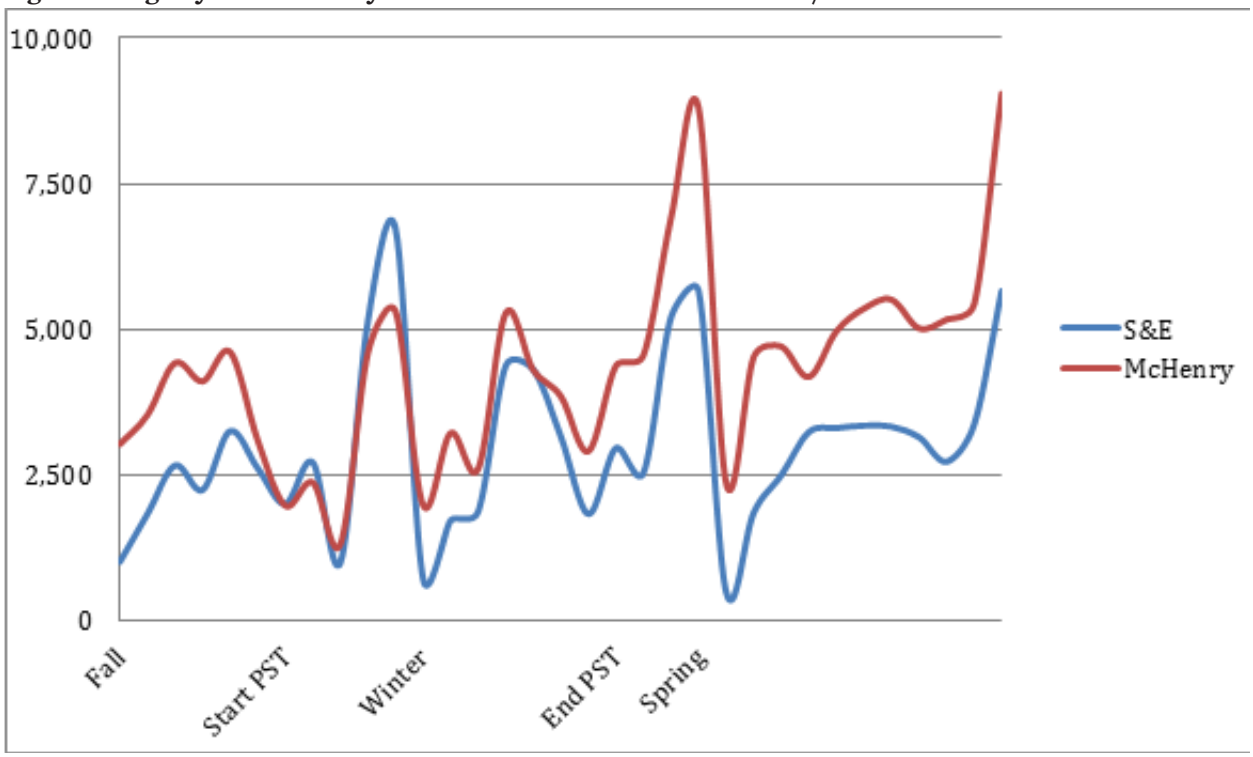
Figure 5 Mean perception of safety to/from Science and Engineering by gender and time of day



We were curious whether the lower perception of safety in the evening affected students' choice of library use by time of day. We did not have gate count data at intervals shorter than a day, but we did have evening head count data taken at intervals of two hours. We examined the data over the course of the previous academic year and discovered that McHenry's share of the user population decreased

from 65 percent overall to 59 percent at night. We further parsed the data to compare the early fall and spring hours under daylight savings time with the late fall and winter hours of standard time. During daylight savings time, 62 percent of the evening users were in McHenry Library. During standard time, the percentage dropped to 53 percent. When we mapped the data as a time series, we found peak demand for S&E around fall quarter finals (Figure 6). S&E use was 20 percent higher than it was for winter and spring finals. Use of McHenry Library dipped for fall finals by 40 percent relative to winter and spring. Overall, use of the library was 16 percent lower during fall quarter finals than it was for winter and spring. We know that students feel safer getting to S&E at night. We suspect but have not confirmed that S&E lacked the capacity to fully serve the demand for study space during fall quarter finals.

Figure 6. Nightly headcount by week for both libraries for AY 2015/16



We could intuit some of the reasons students might prefer Science and Engineering to McHenry. Our campus is situated in a redwood forest and campus planners have taken pains to preserve its natural beauty. McHenry Library is located at the heart of upper campus, in a densely forested area that is inhospitable to automobile traffic. One cannot see another campus building from either the north or south entrance to McHenry Library. City transit stops are a quarter-mile away and the East Remote commuter lot is more than a half-mile distant. The Science and Engineering Library, by contrast, is situated on the well-lit Science Hill, surrounded by busy labs and classrooms. Transit stops and the Core West parking structure are conveniently located.

Question 27 in the Library Space Planning module invited students to tell us what factors influenced their perceptions of safety. Eighteen percent of survey respondents left comments. They confirmed what we suspected and articulated additional points of concern. They told us that lighting on pedestrian paths leading away from McHenry Library was particularly bad. They expressed frustration that the campus lacked a late-night safety escort program. Several expressed a fear of the "other," whether in the form of wild animals (the campus has deer, raptors, wild turkeys, coyotes, bobcats, and the occasional mountain lion) or people who were not part of the campus community. Some told us that being a woman out at night in contemporary society was inherently dangerous and they were always on guard.

The library could not directly remedy all of the factors that make students feel unsafe. We shared

our survey results with campus stakeholders who might be better positioned to do so. Campus Facilities recently upgraded exterior lighting from McHenry Library's south entrance to the Performing Arts parking lot with much brighter LED fixtures. The campus police department has secured funding to support a late-night safety escort program for the 2016/17 academic year. Our Library Student Advisory Council selected branded LED miniature flashlights as one of their promotional items for the year and will give them away at evening events like the quarterly citation management workshop.

Conclusion

The Library Space Planning module gave us a lot of data that will improve our programming. We are early in the first phase of renovating the Science and Engineering Library and are preparing to create a ninety-eight-seat Active Learning Classroom and forty-eight-seat Information Commons on the main floor. Both of these new resources will be available for the 2017/18 academic year.

The survey told us that students generally did not like the older kinds of seating we provided at S&E and were frustrated at the dearth of seats, computer workstations, and AC power outlets. It told us that they used the library more for exam study and completing assignments, and less for accessing physical collections, conducting research, or working on group projects. It told us that they placed a high value on access to good food.

In summer 2016, the library completed a collections consolidation project on the upper level of the Science and Engineering Library, increasing seating capacity on that level by 45 percent. As part of the Active Learning Classroom Project, we are adding a second exit to the Dougherty Reading Room. This space was originally the Science and Engineering Library's current periodical room. In that collection's heavy configuration, one exit was sufficient for the number of users. Adding a second exit will allow us to increase the room capacity from forty-nine to ninety-nine users.

Some campus stakeholders have yet to embrace our vision of a renovated Science and Engineering Library as a student-focused nexus of scholarship. The survey data and local data that the survey made us reconsider in a new light are helping us describe our goals in the context of student success.

Library as Research Site: The Local Value of Participating in a National Research Project

Virginia Dearborn and Jenifer Gundry
Princeton Theological Seminary, USA

New Methodologies Created New Opportunities

During the spring 2016 semester, Princeton Theological Seminary Library completed a study on the research practices and research support needs of advanced scholars at its institution. The study was conducted as part of Ithaka S+R's new national study on the research needs of scholars in religion and theology: Research Support Services Project on Religious Studies.

Ithaka S+R, a not-for-profit research and consulting service that helps academic, cultural, and publishing communities, has in recent years developed a series of innovative studies of the research needs of historians, chemists, and art historians respectively, which have been powerful tools for libraries planning support services to scholars. As Ithaka expands its slate of discipline-based studies, it is also evolving its methodology. Beginning in early 2016, academic libraries can now partner with Ithaka as research sites for the discipline-based research studies. This project is the first discipline study in the Ithaka S+R series to include on-site library research teams at participating institutions, and the first to look closely at scholars in the fields of theology and religious studies. In addition to the 18 participating institutions,[1] support and guidance for the project was provided by the American Academy of Religion, the Society of Biblical Literature, and the American Theological Library Association, working jointly with Ithaka S+R.

The purpose of this short paper is to illustrate the local value that Princeton Theological Seminary Library (PTSL) received from its participation as a research site in Ithaka S+R's 2016 study into the research practices and support needs of senior faculty in the fields of religious studies broadly defined.

The Local Process

The library formed a research team consisting of three librarians.[2] Along with librarians from other participating institutions, the research team completed Ithaka S+R ethnographic research training in February 2016.

Following training, the PTSL research team e-mailed invitations to 15 tenured faculty members (approximately 37.5% of 40 total faculty) randomly sampled from the institution's four academic departments to participate in the study; of the 15 invited, nine (approximately 22.5% of total faculty) ultimately participated in the study. In March and April 2016, the research team conducted the nine in-depth on-campus interviews with faculty members about their research practices and support needs, and gathered photographic documentation of faculty workspaces. The 13-question semi-structured interview protocol designed by Ithaka S+R was used at all 18 local research sites, and provided a consistent data set for analysis by Ithaka in the generation of its forthcoming national discipline report.

Digital audio files of the faculty interviews were transcribed and coded using standard qualitative data analysis methodologies, revealing key themes, from which local findings were derived. A local report was completed in August 2016 and will publicly debut alongside the Ithaka S+R national report in early 2017. Thus, the values discussed here should be considered "early stage" benefits that the institution has received so far in relation to the longer arch of the project's timeline. It is anticipated that in mid-2017 the library will produce a follow-up analysis of improvements that the library was able to enact, following the public debut of both the local and national reports in early 2017.

The Local Value of Discussions Near and Far

The Ithaka project design was specifically shaped to provide participating research sites with a detailed local portrait of faculty research practices and research support needs, allowing libraries to evaluate the effectiveness of current library services and resources. Certainly, the interviews conducted on-site have provided the library with a number of practical ideas for concretely improving library service to faculty that it is keen to pursue. The library also quickly recognized five additional important "early stage" local benefits that it received from its participation.

- **Communicative opportunities arise from localizing national research projects**. Being a small institution, the library already benefits from a close relationship with faculty members. There is in place an array of traditional library outreach and assessment mechanisms aimed at soliciting faculty engagement and feedback, including surveys, focus groups, use analysis, and research studies. However, the library discovered that the practice of localizing national research projects provides unique opportunities to engage with faculty somewhat differently. By using national research project topics and orientation as discussion points, the library has a new conversational "in" to faculty, contextualizing their needs in relation to discipline-wide norms and trends, providing an opportunity for reflection from broader perspectives—a luxury that the rush of the regular academic year does not often allow. The library felt this benefit right away in terms of the Ithaka project. Faculty were excited to participate, learn more about how libraries track faculty research needs, and eager to see how their responses to interview questions might or might not be echoed in aggregate responses from faculty in the national report.
- **National studies speak to stakeholders**. Thoughtfully researched and presented local studies that spin out from important or high profile national projects can also serve as compelling evidence to administrative stakeholders about resource requirements in a competitive academic marketplace. In some cases, national projects have achieved saturation beyond library and technology circles to regularly surface on the radars of administrations or governing bodies—for example, EDUCAUSE's Horizon Report. The PTSL research team plans to take the Ithaka national report and its local report as opportunities for executive analysis of resource allocation and planning at the institutional level.
- **National studies provide helpful objective distance in uncomfortable local discussions**. From the first faculty interview, it was clear that the research team was going to learn a great deal about faculty support needs broadly, including needs beyond the "boundaries" of library responsibility. For example, faculty discussed several important things that impact their research process such as information technology challenges and a desire for a fuller, more formal institutional relationship with the faculty at a nearby university. The "objectiveness" of the Ithaka-designed report protocol will allow the library to pass on sometimes pointed critiques or politically complex recommendations to other offices of the institution with some diplomatic cushion.
- **Externally designed studies ask questions local librarians might not.** The research protocol itself kept the interview focus on hearing the faculty perspective in a more direct, "pure" way—less tainted by librarians' well-intentioned but potentially intrusive leading of the conversation towards a library-centric perspective. In the Ithaka project, the questions that drew faculty out most fulsomely were questions about how their research is impacted by eagle-eye issues about the challenges and opportunities facing the discipline, the state of the academy, and faculty members' own perceptions about their position within the academy. In this way, the library learned things about faculty research approach and research support needs from questions it might not have asked.
- **Library staff training is enriched in a multi-institution setting**. While not all national projects will provide opportunities for local libraries to directly participate in data collection and training, the Ithaka project did. The library received considerable benefit from the project by having library staff formally trained in ethnographic research methods in a two-day, in-person project overview and training at Columbia University. Led by Ithaka S+R's analyst for libraries and scholarly communication Danielle Cooper, the training was necessary to get the participating library research teams organized and equipped to consistently conduct the project's research protocol. The library staff directly benefitted in terms of its research

planning and interview analysis skills, which they can now also extend to other library staff that were not part of the original research team. Finally, the multi-institutional setting of the Ithaka-led training was incredibly helpful, and allowed the research team to learn new methodologies in a lively environment enriched by other institutions' library teams asking questions that would not have occurred to us.

Practical Implications

Going forward, the library's experience in the Ithaka national research project suggests a few practical implications that it will be exploring and that other libraries might find appealing.

First, libraries can link to, customize, and repurpose large-scale national and discipline-wide research projects in the context of their own assessment work locally. Being able to meaningfully link local needs to national trends is a facility the library will be building into its work in a more regularized way.

Second, the potential for collaborative ongoing work in assessment at the discipline level, including with other libraries, scholarly societies, and related organizations that provide services and resources to a specific discipline, is rich. The library is going to continue to seek opportunities to originate new—or expand existing—collaborative assessment projects among its peers and partners.

Finally, the library will work to urge high profile national research projects to "build in" mechanisms for local engagement by providing the original (or modified) protocol, question sets, or tips for localized tailoring of their work at the institution level.

Endnotes

1. The 18 participating institutions include: Asbury Theological Seminary, Baylor University, Brigham Young University, Columbia University, Concordia Theological Seminary, Emory University, Harvard University, Jewish Theological Seminary of America, Luther Seminary, Naropa University, Princeton Theological Seminary, Rice University, Temple University, Tufts University, University of North Carolina at Chapel Hill, University of Notre Dame, Vanderbilt University, and Yale University.

2. The research team consisted of discovery and web services librarian Virginia Dearborn; director of access, research and outreach Kate Skrebutenas; and director of collections, preservation, and assessment Jenifer Gundry.

Visualizing Local Data: The Ithaka S+R Survey at UNLV

Starr Hoffman and Ashley Hall
University of Nevada, Las Vegas, USA

Abstract

In the fall of 2015, the UNLV Libraries decided to use Ithaka S+R's local version of the US Faculty Survey, as well as their newly-designed local surveys for graduate and undergraduate students. Initial reports, while insightful, were too lengthy and challenging to interpret. The Assessment Unit chose to visualize the results in Tableau to make the results more digestible and simpler to navigate. By incorporating various filter options (such as faculty rank and academic department), results were also customizable. The resulting information helped the UNLV Libraries make decisions about how to support student and faculty research as well as explore emerging service areas.

Introduction

For the past two decades, the university libraries at the University of Nevada, Las Vegas, have regularly administered a user survey. The popular LibQUAL+ instrument was used in 2004, 2006, and 2009. In 2012, the libraries created and rigorously tested a custom survey with the help of the institution's Canon Survey Center. The advantage of this survey over the LibQUAL+ instrument was its customized attention to UNLV strategic goals and its brevity—particularly at a large institution whose faculty and students suffer from survey fatigue. In 2015, the libraries decided to use the local version of the Ithaka S+R Survey for faculty, graduate students, and undergraduates. While the Ithaka survey provides only minimal data on user satisfaction with collections and services, its wealth of information on the research practices of students and faculty was tightly tied to the UNLV Libraries' strategic initiatives for developing and re-packaging research services.

The administration of this survey coincided with both the libraries' recent choice of Tableau Desktop as a visualization tool, and the hiring of a new head of planning and assessment. Thus, the Assessment Unit (consisting of the data analyst, a student worker, and the new head) decided to analyze and visualize the entirety of the Ithaka survey in Tableau. This enabled filtering of the data by college and school, increasing its usefulness for the liaison librarians and others.

Ithaka Survey: From Interest to Deployment

Multiple factors went into the UNLV Libraries' decision to implement the Ithaka surveys, including: the positive reputation of Ithaka S+R, the in-depth research-related questions of all three surveys, as well as the level of customer support available for implementation. Customer support was of particular importance, as Ithaka S+R's knowledge and expertise in survey administration could be an asset in overcoming the response rate challenges of previous surveys. While the UNLV Libraries was very pleased with the quality of insightful data in the 2012 custom survey, the response rate was still lower than desired (16% for faculty and staff, 13% for graduate students, and 7% for undergraduates). Ithaka S+R had a well-organized and detailed implementation plan, included a schedule for survey deployment and reminders, provided survey incentives, and managed the data so that it could be anonymous for library staff. This convinced the Libraries' Survey Implementation Team that deployment and implementation would be a smooth process, resulting in significant response rate improvements over previous years.

Deployment Process

Once the UNLV Libraries decided to use the Ithaka S+R survey, deployment was a straightforward process. There were few technical issues and those that did come up were handled quickly. The main complaint from survey takers was the length of time it took to adequately answer all of the survey questions. Some of this length was due to the decision to add optional question modules beyond the core questionnaire. In retrospect, these added modules, which may have negatively impacted survey respondents' experience and increased the number of incomplete responses, did not provide particularly compelling data to warrant the additional length. This feedback was valuable;

in future surveys, length of the survey will be more heavily scrutinized.

Results

The Ithaka survey had better response rates than the previous four user surveys administered by the UNLV Libraries, as seen in the table below:

		Population		
Survey	**Year**	**Faculty/Staff**	**Graduate**	**Undergraduate**
LibQUAL+	2004	10.31%	5.62%	1.07%
	2006	5.34%	1.19%	0.42%
	2009	11.75%	6.14%	3.09%
Custom Local Survey	2012	16.29%	12.87%	6.80%
Ithaka	2015	21.37%	16.13%	11.41%

Higher response rates for Ithaka were likely due to increased visibility and valuable incentives (Apple Watches, UNLV Dining Dollars, and gift bags with UNLV Libraries-branded items). The personalization of e-mail invitations and reminders, as well as increased reminder e-mails, may have heightened interest in and awareness of the survey. Finally, there was aggressive promotion of the survey within the UNLV Libraries and elsewhere on campus via signs, table tents, and events in which students were encouraged to fill out the survey in person at the libraries via designated computer stations.

The Ithaka survey was broken down into multiple modules for each demographic. For undergraduate and graduate students, this included Higher Education Outcomes, Coursework and Academics, Role of the Library, Library Space Planning, Undergraduate/Graduate Research, Demographic Questions, and selected modules that applied only to each demographic. For the faculty survey, the UNLV Libraries explored the Core National Questionnaire and demographic questions as well as the following optional modules: *data preservation and management*, *scholarly communication*, and *market research*. Findings were mixed, but a few common themes did emerge across all populations.

Role of the Library

All populations felt that the UNLV Libraries' funding of resources was of significant importance. Eighty-four percent of undergraduate students, 91 percent of graduate students, and 90 percent of faculty ranked this collection development function as either a five or a six on a six-point scale.

There are also similarities across all populations in the question, "Which of the following starting points did you use to begin your research?" All three populations regularly used both the library catalog and a general-purpose search engine as a starting point for their research. Thirty-two percent of faculty, 32 percent of graduate students, and 35 percent of undergraduate students started their research on the library website while 30 percent of faculty, 23 percent of graduate students, and 38 percent of undergraduate students used a general-purpose search engine.

Teaching and Information Literacy Skills

All populations felt that it was the responsibility of the library to support student learning by helping students develop their research skills. Seventy-five percent of faculty rated this library function as a six or higher on a scale from one to ten. Similarly, 55 percent of graduate students and 89 percent of undergraduate students agreed that research skill support was the responsibility of the library (based on a seven-point strongly agree–strongly disagree scale).

Ithaka Results and Decision Making

The final data resulting from Ithaka has been useful in several regards. First, the information about faculty and students' view of the importance of collection resources helps with collection development and budget justification. In addition, this finding encourages further analysis of collection use statistics, to ensure the collection is useful and tailored to the UNLV Libraries' specific users' needs.

Second, research practices have informed the development and revision of research support services, which are currently under way. With faculty and graduate students using the library's website only slightly more often than a general purpose search engine, and undergraduate students using it less, a further analysis of possible causes for this is warranted. Website usability studies as well as research workshops for students emphasizing the library website's search function could increase use. Discovering the needs and expectations of our faculty in particular has helped us locate gaps in campus support and to prioritize services accordingly.

Third, the data strongly indicated that both faculty and students value the role of librarians in developing students' research skills. This supports ongoing provision of library instruction across the UNLV curriculum. The response by both graduate and undergraduate students indicates that such instruction is valuable at all levels, not only in first-year seminar courses.

This information has also been useful for our liaison librarians, as they have gained new insight about how students and faculty locate and use information. Additionally, they learned more about the disciplinary-specific research practices of the faculty that they represent. An unexpected benefit of this data has been its usefulness in informing accreditation reports for various colleges and schools.

Sharing the Data: Problem

Sharing the survey data was an immediate challenge upon receiving it from Ithaka S+R. The survey questions themselves were lengthy—the resulting report of findings was exceptionally long. These reports were nearly impossible for library faculty and staff, let alone interested parties outside the libraries, to meaningfully digest. Thus, easy-to-navigate data and quickly understandable results became a top priority for the Assessment Unit.

Tableau

At the time of Ithaka deployment, the UNLV Libraries had begun to utilize Tableau for data reporting. Tableau's powerful visualization features seemed a viable solution for creating more meaningful Ithaka reports. Visualization of the Ithaka results proved useful in multiple ways: (1) it allowed consumers of the data to quickly view results of multiple questions visually, as opposed to having to read through lengthy conclusions, (2) it allowed users to filter results by multiple metrics including demographic data, a useful feature as departments and leaders try to make sense of the information relevant to them, and (3) the new platform elicited excitement as it was a welcome change from standard narrative reports.

When visualizing the Ithaka data, the Assessment Unit first identified how library staff might utilize the results and then identified ways that Tableau could facilitate exploration of those results to meet specific needs.

How Can Ithaka Results Be Used?

The following short list was used to start the Ithaka dashboard design process:

1. Library liaisons use results to inform their work with their respective academic departments.
2. Library leadership use results to inform strategic planning.
3. Library staff uses results to plan new services.
4. Library collections department uses results to inform collection development.

Tableau Solutions

The following dashboard design elements were chosen to meet the needs of users seeking to complete the above tasks.

1. Include filter options for liaisons enabling them to view results by college and department.
2. Group Ithaka questions into categories that correspond with the UNLV Libraries' Strategic Plan.
3. Group Ithaka questions into categories that correspond to library working committees.
4. Group Ithaka questions into categories that pertain to collections and include filters enabling customized analysis.

Ithaka Dashboards

Once the Assessment Unit created a basic plan and outline of the dashboards, the data analyst cleaned and reshaped the data. Preparing survey data for Tableau is complex, since the tool was designed primarily for use with quantitative (count and financial) data. Leaving the full text of both question and response in the data (as opposed to coding the responses) simplified the labeling process within Tableau. In order to use demographic data as filters, this data was moved into a separate data sheet. Survey questions, with the exception of demographic

questions, needed to be reshaped since Tableau requires that each row of data include one question and one response, thus duplicating respondent IDs on multiple rows. This varies from the typical SPSS format, in which each column represents a question (usually the label) and contains a corresponding response, and each row corresponds to a single respondent. Survey questions were visualized using a variety of charts and graphs including standard bar charts, stacked bar charts, data tables, and tree maps. Filter options included class/faculty rank, age range, gender, college, department, and faculty's primary responsibility (research, teaching, or both). Care was taken to ensure that response rates were high enough within filtered categories so as to not identify respondents. To reduce this chance, demographic filters were removed when fewer than five individuals responded to a given question.

Ithaka Dashboards: Sharing Results

Once the Assessment Unit and the dean of the UNLV Libraries approved the Ithaka dashboards, results were presented to library faculty and staff in an open forum in which they were able to explore the dashboards via Tableau Reader. This unscripted forum allowed participants to explore the data independently and come to their own realizations and conclusions. Screenshots and full dashboards were shared with select individuals throughout the institution while executive summaries were shared with the entire university community. Full dashboards for all three surveys were uploaded to the UNLV Libraries' Tableau Server for anyone with access to view and explore.

Conclusions

The use and implementation of the Ithaka surveys at the UNLV Libraries was deemed a success. This survey had higher response rates than previous user surveys implemented at the UNLV Libraries, few technical difficulties, and few individual complaints or challenges with the survey interface and material. The survey results provided valuable insight into faculty and student research practices, as well as some information about user satisfaction with collections and services. These results have already been used in decision making for the development of new research support services, and continue to provide valuable information to liaison librarians in particular.

By visualizing the Ithaka data via Tableau and grouping results into relevant categories, as well as incorporating various filter elements, consumers of the data were able to explore the results efficiently and in great depth. For example, staff interested only in questions related to data use and management were able to find all related questions grouped on a data use and management dashboard. Once on that dashboard, users were able to drill down into the data with filters to discover how individual colleges, departments, or respondent groups (faculty/student rank, age groups, etc.) answered specific questions. The resulting visualized report was found to be engaging and digestible, and ultimately more meaningful than typical narrative reports. Ultimately, both the survey content and the visual presentation generated excitement and enthusiasm, encouraging greater exploration and use of this data for decision making.

Survey Administration Best Practices: Lessons Learned from the 2015 Ithaka S+R Faculty Survey

Christine Wolff
Ithaka S+R, USA

Introduction

Since 2000, Ithaka S+R has fielded the US Faculty Survey, which tracks the evolution of faculty members' research and teaching practices against the backdrop of increasing digital resources and other systemic changes in higher education, on a triennial basis. In 2012, we saw the response rate to the survey decline from previous cycles, and so we employed a variety of strategies to stop this downward trend with the 2015 cycle.

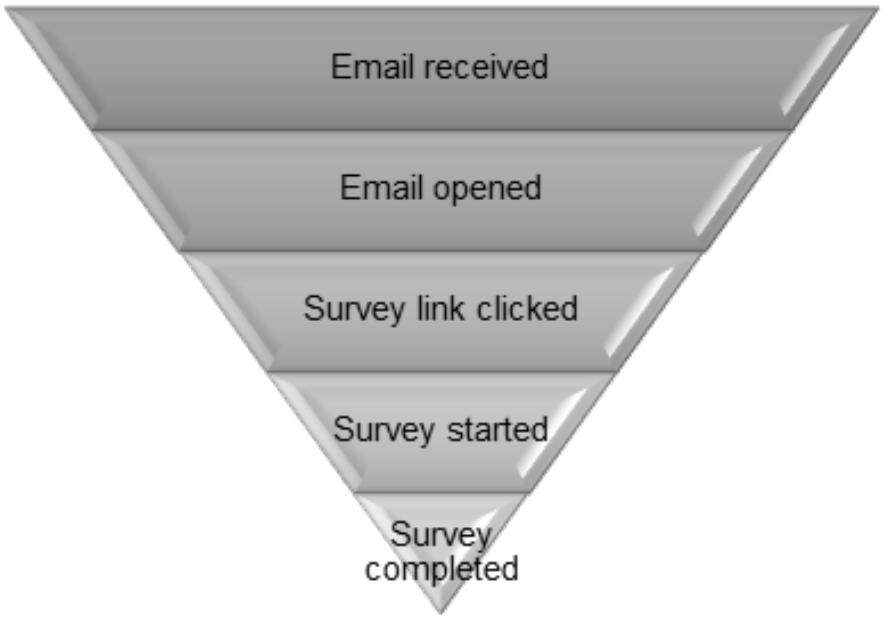
The strategies worked: the rate of response nearly doubled, from 3.5% to 6.7%.[1] We have now employed these strategies with 80-plus local surveys of students and faculty members fielded at individual colleges and universities and have identified many ways to encourage survey participation as well as elements that can potentially derail participants.

By increasing response rates, and thus decreasing the rate of non-response, we are able to decrease the effects of non-response bias, which can occur when individuals who do not respond to the survey are systematically different from those who do. Thus, increased response rates often lead to more diverse, representative perspectives from respondents and lend validity to survey results by decreasing non-response bias.

The following paper outlines a number of the strategies that Ithaka S+R employed in the 2015 US Faculty Survey as well as with surveys of faculty members at individual colleges and universities.

Strategies

To increase the response rate to the 2015 US Faculty Survey, Ithaka S+R recognized that we needed to maximize action in each of the steps in the survey response process depicted in the funnel graphic below. Increasing engagement in each stage of this process has a ripple effect on all subsequent steps, with action in each step being contingent on the previous step(s). The following paper details strategies that were employed in each of these parts of the process to successfully increase the response rate from the previous cycle of the survey.



Effective subject lines

The first challenge in convincing invitees to complete our survey involved making sure that the e-mail invitation we sent was both received and opened. Considering the overwhelming amount of e-mail that many faculty members receive on a daily basis, doing so is not an easy task. We knew that crafting enticing subject lines and selecting appropriate signatories could mean the difference between garnering valuable survey responses and having our invitation messages ignored or deleted.

Before we sent invitations for the US Faculty Survey 2015 in October 2015, we designed an A/B test in August to pilot two versions of the questionnaire. We used these pilot versions to test (1) the efficacy of various subject lines, and (2) changes to the questionnaire from the previous cycle, which will be discussed later in this paper. Research on e-mail marketing has shown that e-mails with subject lines containing words that imply time sensitivity, importance, and exclusivity (e.g., "urgent," "announcement," and "invitation") tend to obtain higher open rates.[2] Personalizing the subject line has also been shown to increase open rates, especially when both the recipient's first and last name were included.

With this in mind, we tested a number of subject lines across the A and B versions of the survey, while keeping all other variables (e.g., time of day that the e-mails were sent, from whom the e-mails were sent, the content of the e-mail) consistent across the versions. We found that subject lines that included personalization—that is, that contained the recipient's first and last name, or began with "RE:" or "Re:," indicating that the reminder was in response to another message—led to response rates 2–3 percentage points higher than those that did not meet these criteria, and therefore employed these subject lines when we fielded the national study in October.

Partnerships with scholarly societies

In fielding the previous cycle of the US Faculty Survey in 2012, we partnered with key leaders of five scholarly societies under whose name the invitation and reminder e-mails were sent to all individuals in respective disciplines and fields. From running previous national and institution-specific surveys, we recognized the importance of the signatory; choosing the right person from whom the e-mail comes is crucial for ensuring that the recipient will open the e-mail.

In 2012, we found that response rates were substantially higher for respondents who received these messages from scholarly societies as compared to those who received the invitation from the managing director of Ithaka S+R. Based on these findings, we sought out additional partnerships with scholarly societies for the 2015 cycle and were able to incorporate signatories from twelve societies.[3]

Indeed, the average response rate for respondents in disciplines who received invitations and reminders from our scholarly society partners was substantially higher than the average response rate for respondents who received invitations and reminders under Ithaka S+R's signatory—12.6% versus 5.7%, respectively.

Sending multiple reminder messages

Sending multiple reminders via e-mail provides Ithaka S+R with an opportunity to reach recipients who did not open the survey invitation, or did open it but did not have time to complete the survey. Ithaka S+R has found that for institution-specific surveys, sending multiple reminder messages at varied times is the best approach for capturing new audiences of respondents, as invitees tend to have the same habits around checking e-mail from week to week.

Due to contractual limitations in 2012, we were unable to send more than one reminder message while the survey was in the field. For 2015, we were able to obtain permission to send three reminder messages, and did so at varied times, typically during the late morning and early afternoon on Tuesdays, Wednesdays, and Thursdays.

Modifications to the questionnaire

Noting the declining response rates realized in previous cycles of the survey in conjunction with qualitative feedback on the length of the questionnaire as a major deterrent, the 2015 questionnaire was designed to condense items and remove items that were no longer valuable for tracking purposes.

Ithaka S+R reduced the overall length of the 2015 questionnaire as compared to the 2012 cycle by approximately 19%; during the 2012 cycle, the questionnaire was made up of up to 52 questions,

while the questionnaire in 2015 was made up of up to 42 questions.[4]

Furthermore, we removed much of what we considered to be redundant instructions for each response scale, as we found that this was leading to respondents becoming fatigued while taking the survey and dropping off before completing it. For example, in the previous cycles of the survey, all questions with a 10-point scale measuring importance included the following instructions: "Please use the scales below to rate from 10 to 1 how important each of the following methods is for staying current with new scholarship in your field, where 10 equals 'Extremely important' and 1 equals 'Not at all important.' Please select one rating for each item."

When we ran the pilot versions of the survey in August 2015, one version included the questions exactly as they appeared for the 2012 version of the survey with the lengthy instructional text included. The other version included the updated questions *without* the repeated lengthy instructions for the response scales and instead included labeled end points on all response scales; this significantly reduced the overall length of the survey.

We determined that the removal of the long instructions and the addition of the end point labels did not affect responses—that is, the revised shortened version of the questionnaire was comparable to previous iterations of the survey and thus enabled the continuation of tracking changes in responses over time—but *did* lead to shorter completion times (approximately 5% shorter) and higher completion rates. Based on these findings, we implemented the updated version for the 2015 national survey.

Concluding remarks

By employing the strategies outlined in this paper, Ithaka S+R was able to nearly double the rate of response in the 2015 US Faculty Survey from the previous cycle of the survey, allowing us to capture a greater share of faculty members' attitudes and behaviors, and thus decreasing the likelihood and effects of non-response bias.

Recommendations on survey design and administration should always be considered in the context of the recipients of the survey invitation and the organization, unit, and/or individual distributing the survey. By appropriately adapting and employing the strategies outlined in this paper, organizations within and outside of the higher education community can maximize their survey response rates and minimize the effects of non-response bias.

Endnotes

1. Both response rate figures do not include medical faculty members for the purposes of drawing appropriate comparisons across the survey cycles; these faculty members were not included until the 2015 cycle.

2. Neel Shivdasani, "Subject Line Data: Choose Your Words Wisely," *MailChimp Blog*, November 13, 2013, http://blog.mailchimp.com/subject-line-data-choose-your-words-wisely/.

3. These scholarly societies included the American Anthropological Association; the Archaeological Institute of America; the American Historical Association; the American Sociological Association; the Association for Slavic, East European, and Eurasian Studies; the College Art Association; the Modern Language Association; the National Council of Teachers for English; the American Council on the Teaching of Foreign Languages; the Society of Biblical Literature; the American Academy of Religion; and the American Musicological Society.

4. The actual number of questions displayed is contingent upon answers to questions in the survey.

What Do Faculty Think? Perspectives from the Ithaka S+R Faculty Survey 2015

Christine Wolff
Ithaka S+R, USA

Introduction

The Ithaka S+R Faculty Survey has examined the attitudes and behaviors of scholars at four-year colleges and universities across the United States on a triennial basis since 2000. It provides the higher education community with a regularly updated snapshot of its faculty members at a moment in time, as well as a trend analysis of changes. In the sixth triennial cycle fielded in fall 2015, we surveyed a random sample of US higher education faculty members in the humanities, social sciences, sciences, and medical fields.

Ithaka S+R's Faculty Survey is a tool for tracking attitudes and self-reported practices of scholars on a variety of issues over time. The survey's broad coverage of the faculty member population across the US, and its ability to provide disciplinary and institutional type stratifications, provide for an unusual depth of analysis. Given levels of response to the survey, findings can be analyzed by discipline, institution type, and other demographic characteristics.

In this sixth cycle of the survey, we observed key shifts in the way that scholars discover academic literature, use print and electronic versions of resources, and view the role of the library. While faculty members have expressed a strong preference for starting their research with specific electronic resources and databases in previous cycles of the survey, they are now increasingly and equally using their academic library's website or catalog as their starting point. There appears to be no observable trend towards a format transition for monographs; faculty members' preference for using scholarly monographs in print format rather than digital format has only increased since the previous cycle of the survey. And, since the previous cycle of the survey, there have been increases in the share of faculty members who believe their undergraduate students have poor research skills and in the share that perceive the role of the library in helping undergraduate students develop these skills as highly important.

Additionally, Ithaka S+R included medical scholars in our population for the first time in the 2015 cycle, and found that while respondents sometimes have attitudes and practices that parallel their colleagues in the social sciences and physical sciences, they often are unique in the way that they discover and access information, conduct and disseminate research, teach, and use the library.

Methodology

The Ithaka S+R US Faculty Survey 2015 was designed to continue tracking critical trends in higher education from previous survey cycles while at the same time introducing new questions to address issues of current strategic importance. New questions were tested through a process that included pre-tests and a pilot survey.

The population for this survey was faculty members from all of the arts and sciences fields and most professions at colleges and universities in the United States that grant a bachelor's degree or higher. As medical faculty members were added to the survey population for the first time in this cycle, they are included in our disciplinary analysis but are excluded from all measures of aggregate response, so that appropriate aggregate comparisons can be drawn against previous survey cycles.

The survey was fielded in fall 2015 to a sample of 145,550 faculty members, and we received a total of 9,203 responses, for an aggregate response rate of 6.3%. Invitations and reminder messages were sent from a variety of sources, including Ithaka S+R, a number of scholarly societies, and several colleges and universities. Response patterns varied to some degree by discipline, and to adjust for this we have weighted the aggregate results from our sample proportionally to match population parameters.

Many questions in the survey posed strongly worded statements, such as "My undergraduate students have poor skills related to locating and evaluating scholarly information," and asked scholars to rate

from 1 to 10 how well each statement describes their point of view, where a 10 equals "extremely well" and a 1 equals "not at all well." In our reporting here, we have aggregated responses to simplify the presentation of findings; responses of 8, 9, and 10 are grouped together for analysis and characterized as "strongly agreeing" with the statement; responses of 1, 2, and 3 are grouped together for analysis and characterized as "strongly disagreeing" with the statement; and responses of 4, 5, 6, and 7 are grouped together and characterized as relatively neutral responses.

We also asked scholars other questions with 1–6 answer ranges, such as when we asked them to rate the importance of a given library role from "not at all important" to "extremely important." Again, we segmented responses as strongly negative responses (1–2), neutral responses (3–4), and strongly positive responses (5–6).

Datasets from the 2006, 2009, 2012, and 2015 cycles of the Faculty Survey have been deposited with ICPSR for long-term preservation and access.[1]

Findings

The following section highlights key findings from the Ithaka S+R Faculty Survey 2015, presented at the 2016 Library Assessment Conference. The full public report of findings is available on the Ithaka S+R website.[2]

Discovery starting points in flux

As research and teaching practices evolve in the context of substantial environmental change within higher education, the ways in which faculty members discover resources for these practices have shifted. In addition to providing traditional print resources, libraries have more recently supported these changes with a variety of digital tools including the library website, catalog, and discovery services. Outside of the library, mainstream search engines (e.g., Google or Yahoo) and targeted academic discovery products (e.g., Google Scholar) offer their own systems to enable discovery.

One of the longest-running questions in the Ithaka S+R Faculty Survey asks respondents where they begin their research (see Figure 1 and Figure 2). Since this question was first posed in 2003, we have seen a steady decline in the reported use of the library building as the starting point for conducting academic research, along with a clear increase in the use of general purpose search engines. The 2015 findings are consistent with these trends.

However, starting in 2012, we have seen a reversal of the trends for beginning with an online library website or catalog, which had been declining prior to 2012, and for a specific electronic research resource/computer database, which had previously been on the rise. The increase in the use of the library website or catalog in recent years has been driven primarily by the practices of scientists and social scientists, while the decrease in the use of specific electronic resources/databases has been driven by social scientist behavior.[3] These trends, driven by scientists and social scientists, may be reflective of library investments in discovery tools which are especially of use to faculty members in these fields due to the types of materials they use in their research (e.g., journals) and the interdisciplinary nature of social science research, which is particularly aided by discovery services.

As might be expected, given their training, medical faculty members most closely resemble scientists in the way they begin their research, with nearly a majority gravitating towards a specific electronic resource/database, followed by a large share starting with a general purpose search engine.

Figure 1: Below are four possible starting points for research in academic literature. Typically, when you are conducting academic research, which of these four starting points do you use to begin locating information for your research? Percent of respondents who indicated that each option is the starting point for their research.

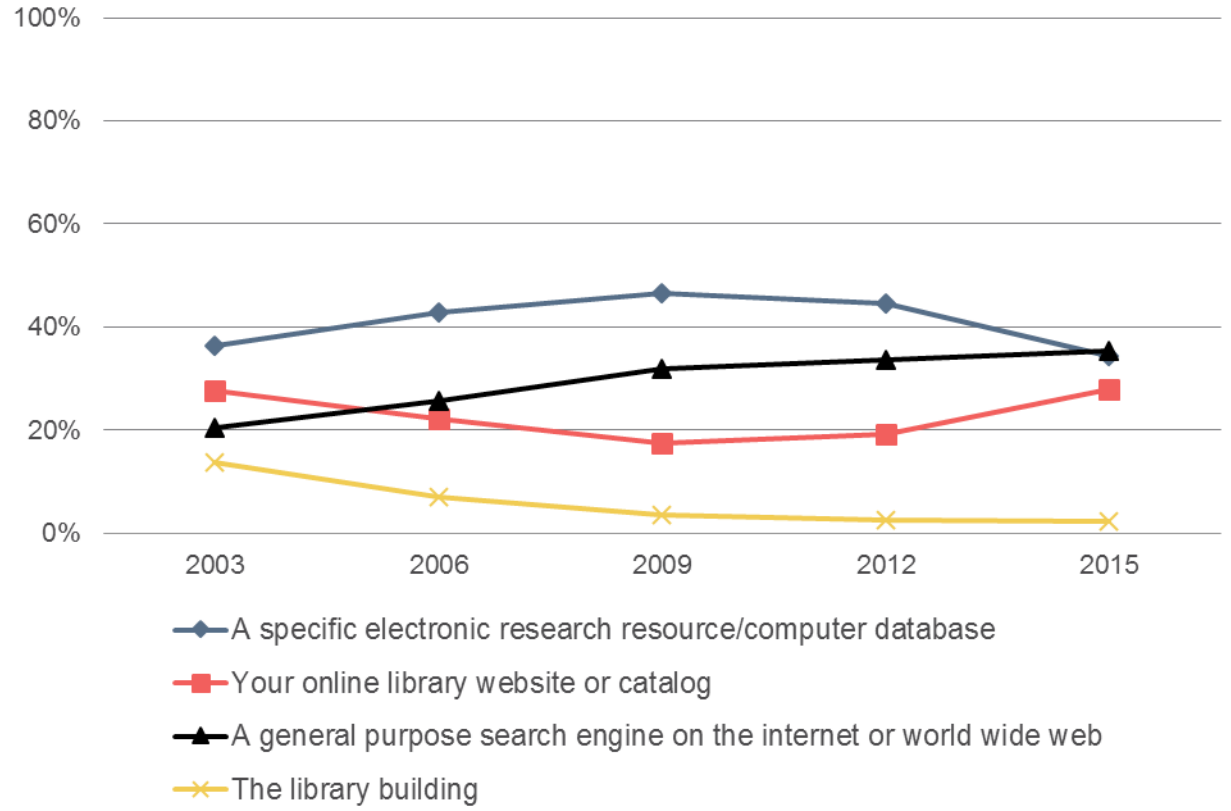
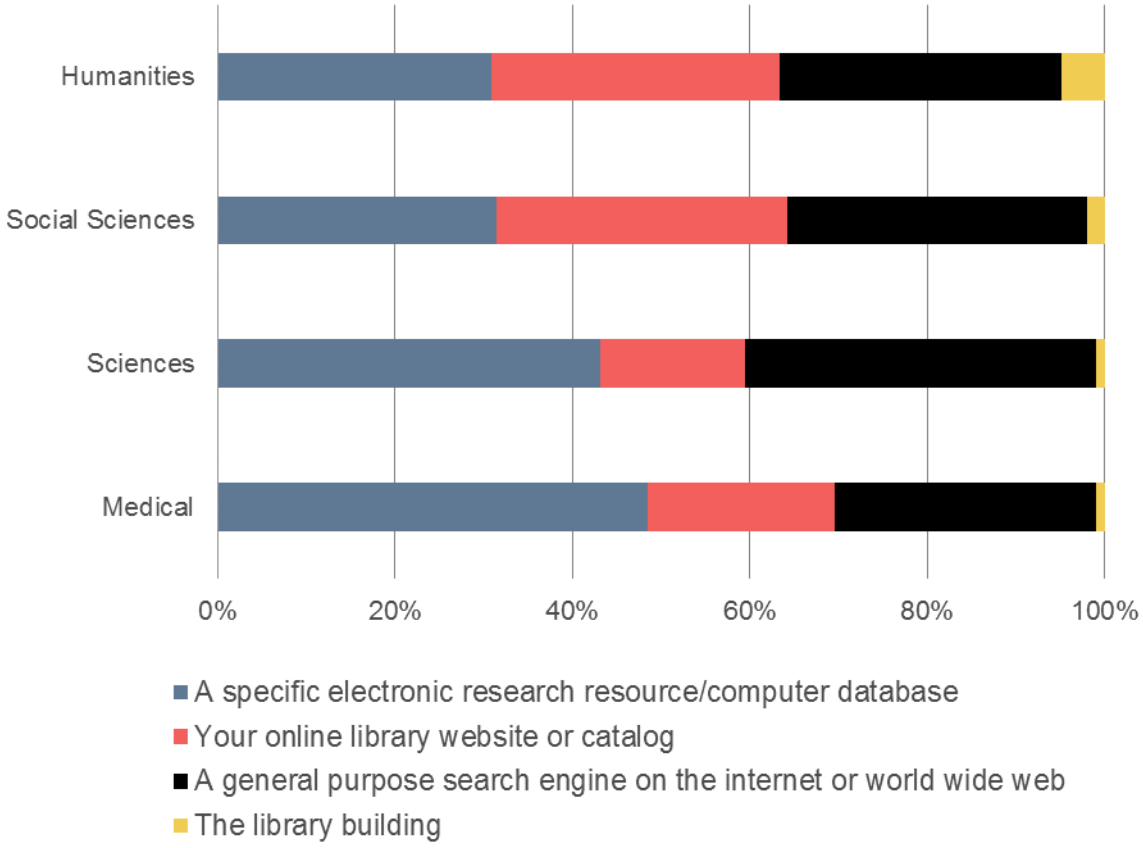


Figure 2: Below are four possible starting points for research in academic literature. Typically, when you are conducting academic research, which of these four starting points do you use to begin locating information for your research? Percent of respondents who indicated that each option is the starting point for their research.



Increased interest in supporting students

Understanding how perceptions of the role of the collections and service-oriented functions of the library have evolved over time has been one of our longest-running areas of interest addressed in the Faculty Survey.

We asked respondents to rate the importance of various functions of their college or university library. This question has been asked for a number of years and has allowed us to track changing perceptions of the role of the library. We recognize that the list of library functions may not address all of the roles of the library, but we believe that these functions cover many of the broad faculty-facing roles played by the library. The below list presents these six functions, each identified by a shorthand name used in this document (but not presented to respondents in the survey) for convenience:

- Gateway: "The library serves as a starting point or 'gateway' for locating information for my research."
- Buyer: "The library pays for resources I need, from academic journals to books to electronic databases."
- Archive: "The library serves as a repository of resources; in other words, it archives, preserves, and keeps track of resources."
- Teaching support: "The library supports and facilitates my teaching activities."
- Research support: "The library provides active support that helps to increase the productivity of my research and scholarship."
- Undergraduate support: "The library helps undergraduates develop research, critical analysis, and information literacy skills."

The gateway, buyer, and archive roles are collections-oriented roles and have been tracked

since the 2003 cycle of the survey, whereas the teaching, research, and undergraduate support roles are more service-oriented roles that have been added to the questionnaire more recently. Prior to the 2015 survey, these collections-oriented roles consistently represented the top three functions as identified by faculty members, but this is not the case in the 2015 findings (see Figure 3, Figure 4, and Figure 5).

Figure 3: How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below? Percent of respondents who identified each function as highly important.

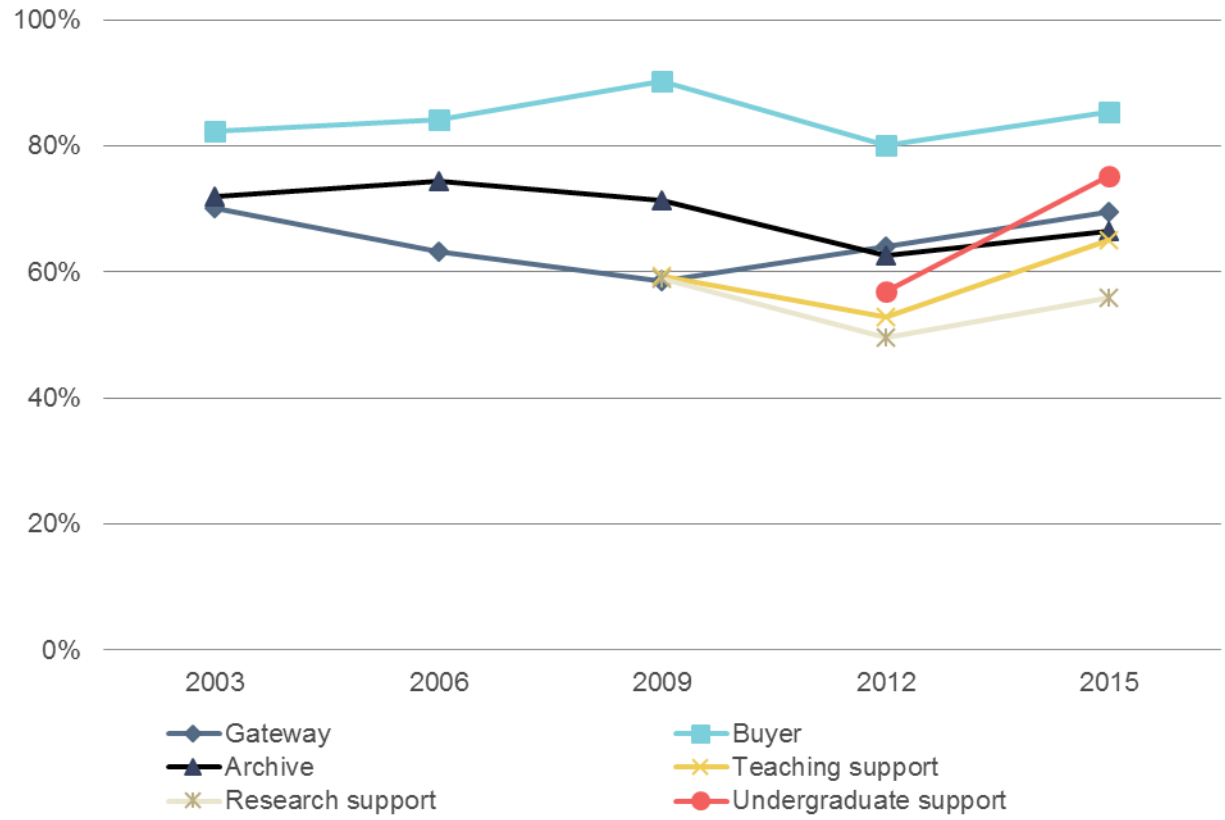


Figure 4: How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below? Percent of respondents who identified each function as highly important.

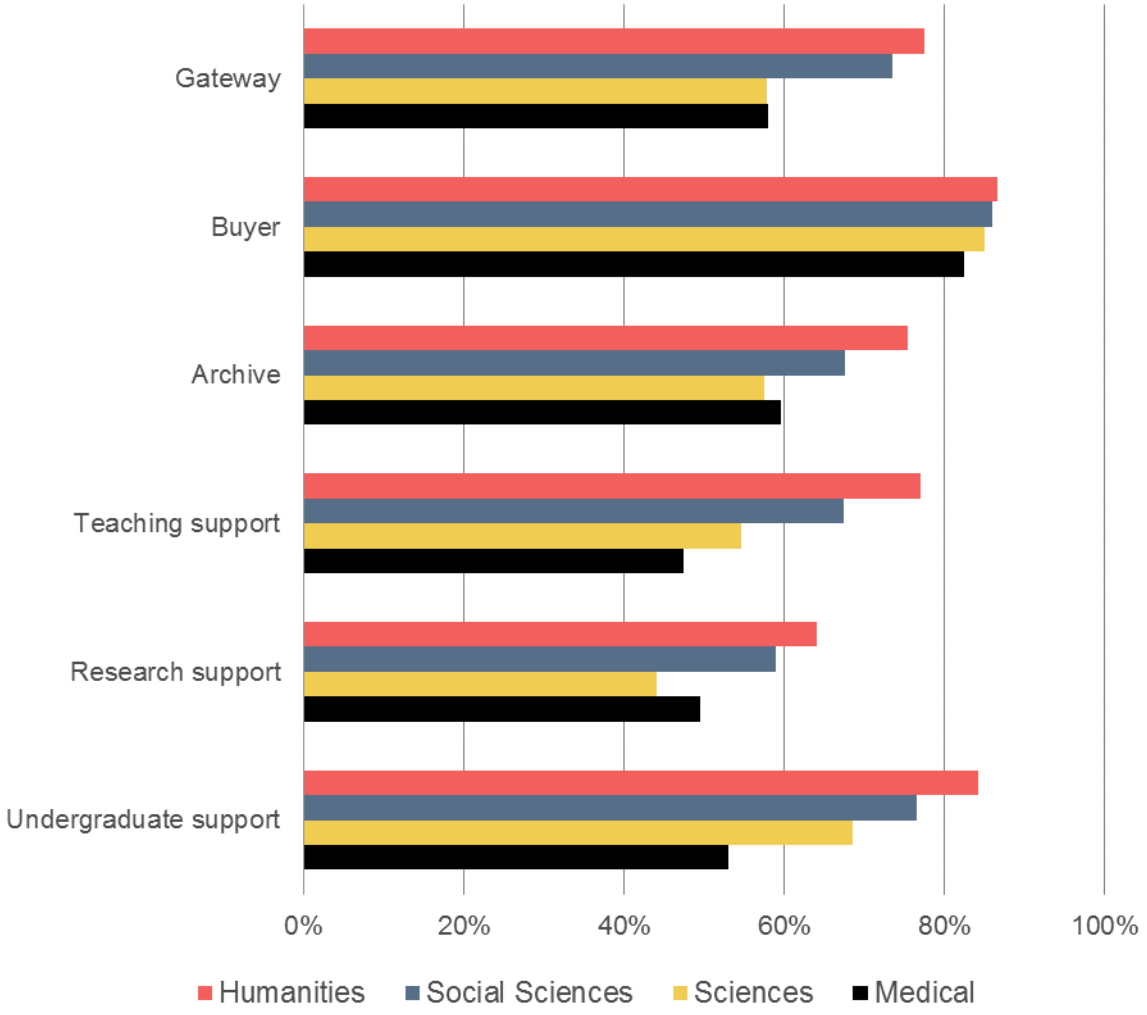
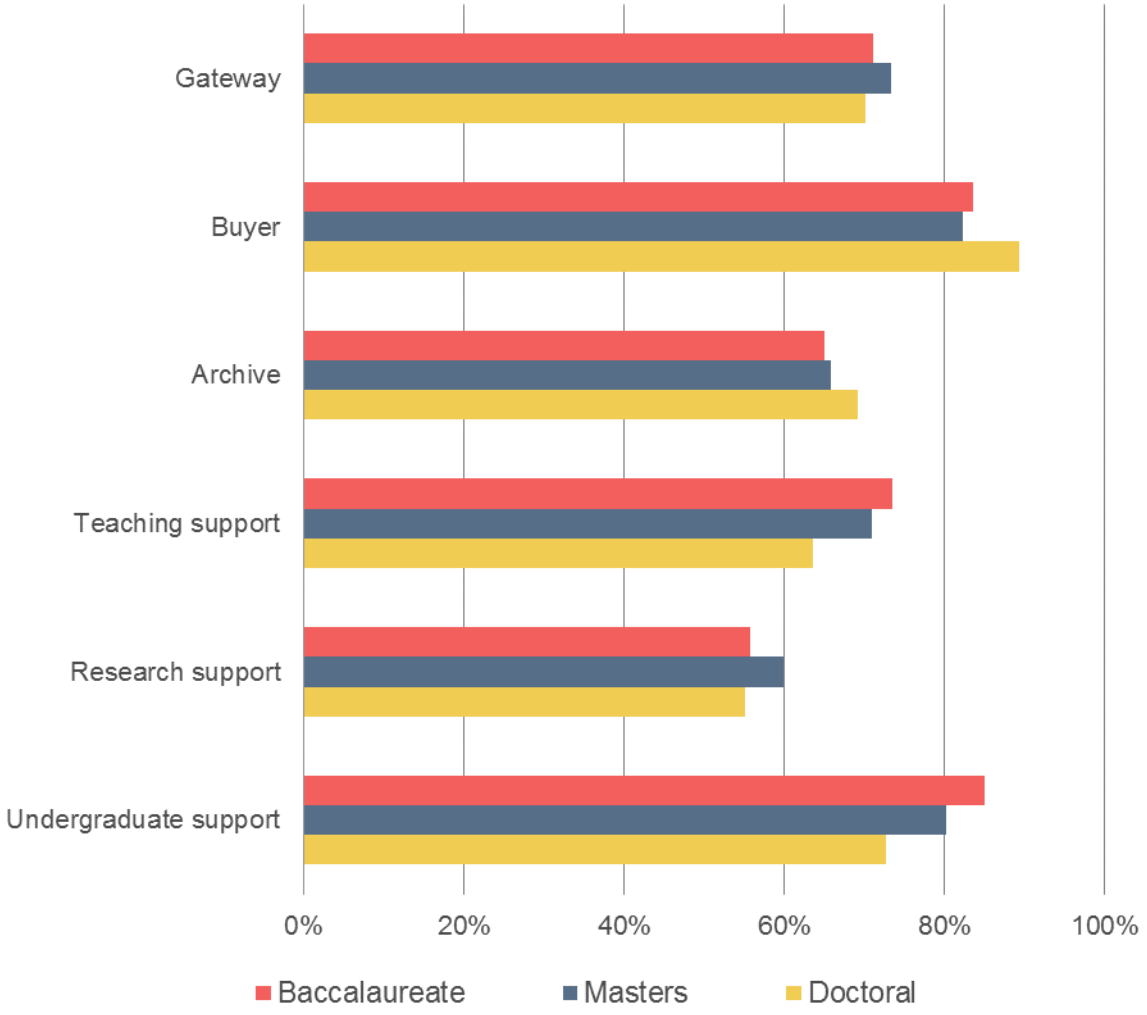


Figure 5: How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below? Percent of respondents who identified each function as highly important.



Since 2012, there has been a substantial increase in the perceived importance of the undergraduate support role, which is now the second most important role for respondents. We observed increases for this role across disciplines since 2012, with the share of humanists increasing from 70% to 84%, social scientists from 58% to 76%, and scientists from 44% to 69%. Similarly, we saw increases across institution types, with respondents from baccalaureate colleges increasing from 70% to 85%, from master's colleges and universities from 53% to 80%, and from doctoral universities from 51% to 73%.

Furthermore, 54% of respondents strongly agreed that their undergraduate students have "poor skills related to locating and evaluating scholarly information," which represents an observable increase since the 2012 Faculty Survey (47%). This increase is consistent across the disciplines, with humanists reporting the highest level of agreement in 2015 (see Figure 6). Respondents from master's colleges and universities indicated higher levels of agreement with this statement as compared to respondents from baccalaureate colleges and doctoral universities (see Figure 7).

The increase in perceived importance of the undergraduate support role, in conjunction with the increased share of faculty members agreeing that their undergraduate students have poor research skills, demonstrates that the role of the library is

undoubtedly changing, and that libraries will need to continue paying attention to and supporting the needs of scholars as they continue to evolve.

Figure 6: My undergraduate students have poor skills related to locating and evaluating scholarly information. Percent of respondents who indicated that they strongly agree.

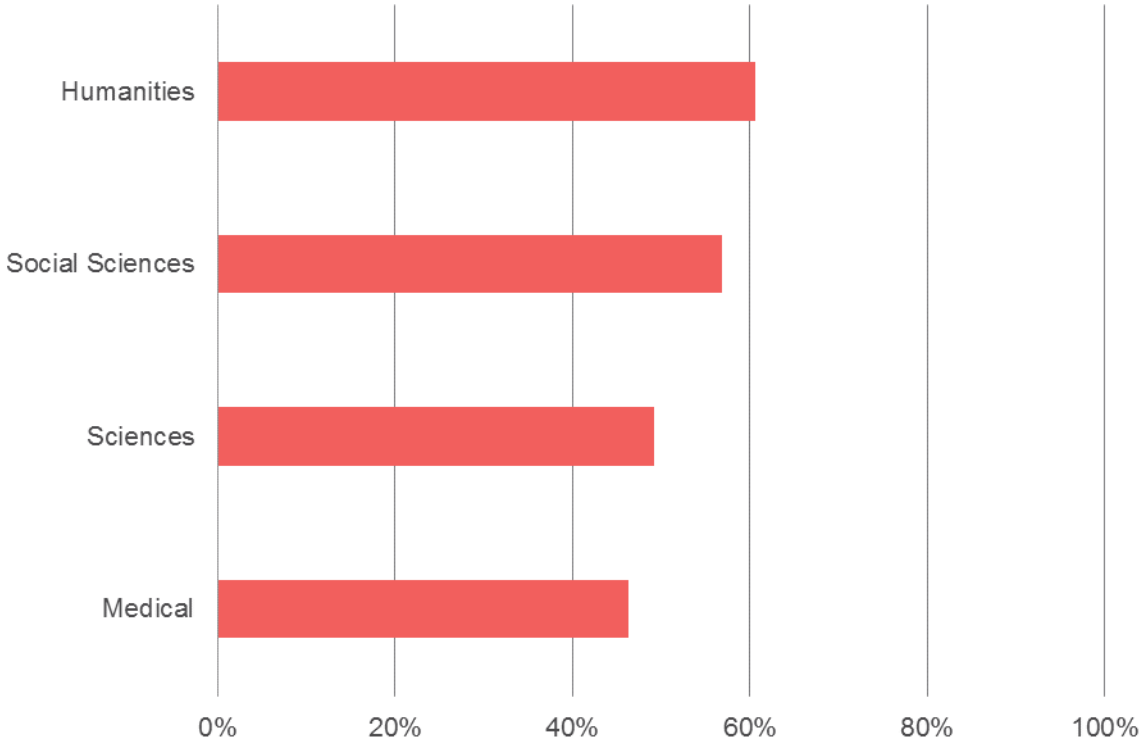
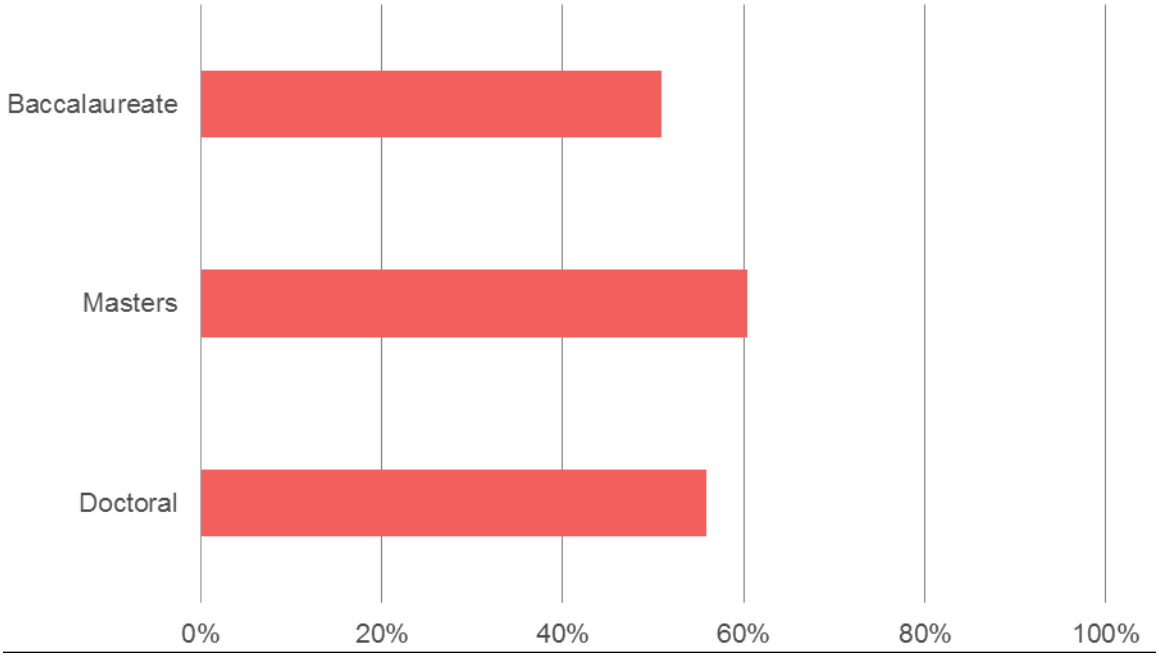


Figure 7: My undergraduate students have poor skills related to locating and evaluating scholarly information. Percent of respondents who indicated that they strongly agree.



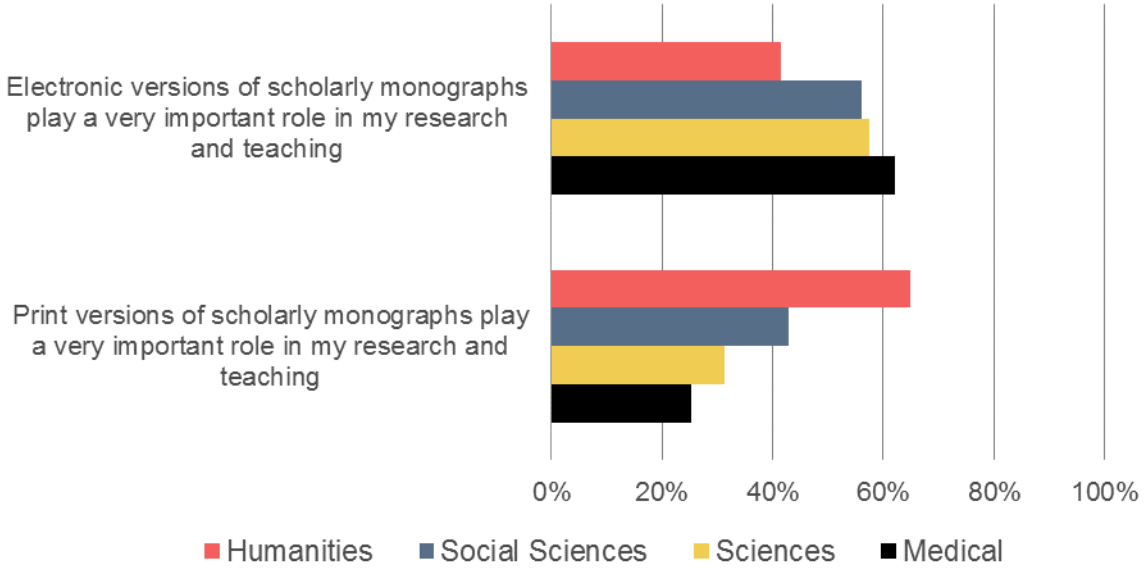
Lack of a format transition for monographs

As many academic libraries transition to investing in and utilizing a greater share of electronic resources and a smaller share of print resources, the Ithaka S+R Faculty Survey has examined how faculty members' attitudes and behaviors have shifted in response to these changes.

While faculty members seem to be embracing the transition from print to electronic journals, our findings on perceptions of transitions to electronic monographs are a bit more nuanced.

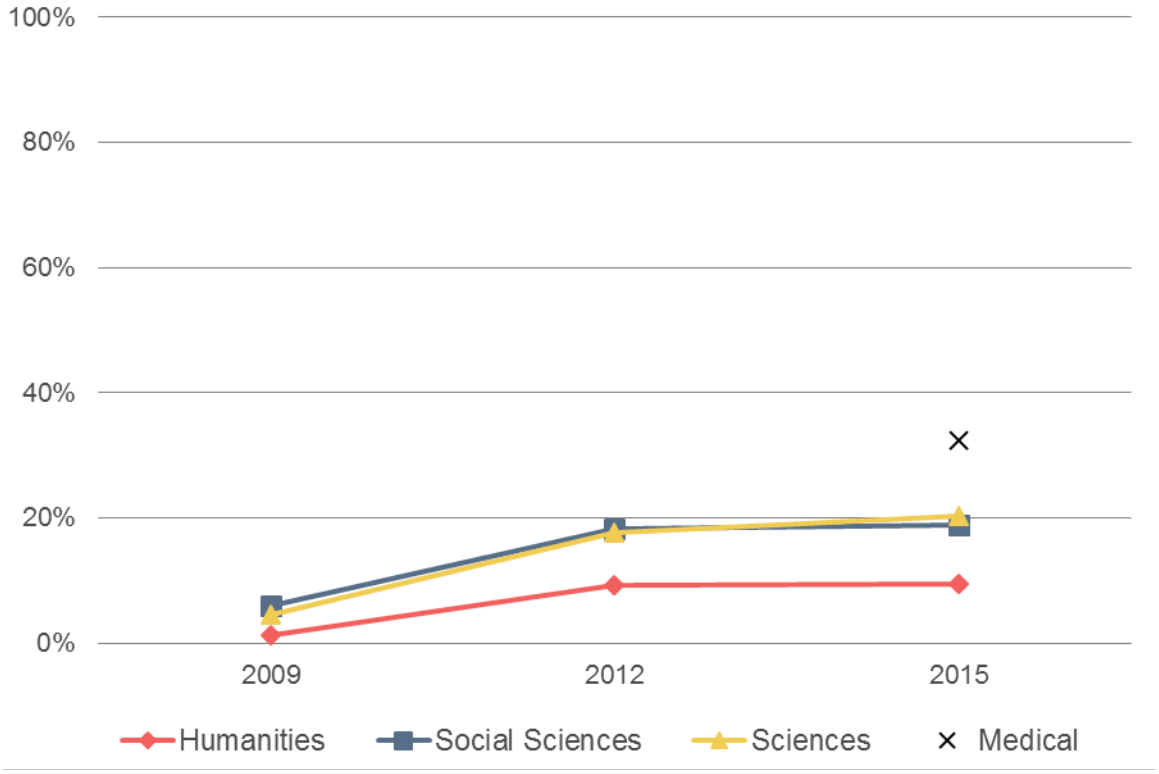
As compared to print versions of scholarly monographs, a slightly larger share of faculty members strongly agree that electronic versions play a very important role in their research and teaching. Humanists report the highest levels of importance regarding print versions and report slightly lower levels of importance regarding electronic versions when compared with their peers in other disciplines (see Figure 8).

Figure 8: Please use the 10 to 1 scales below to indicate how well each statement below describes your point of view. Percent of respondents who strongly agreed with each statement.



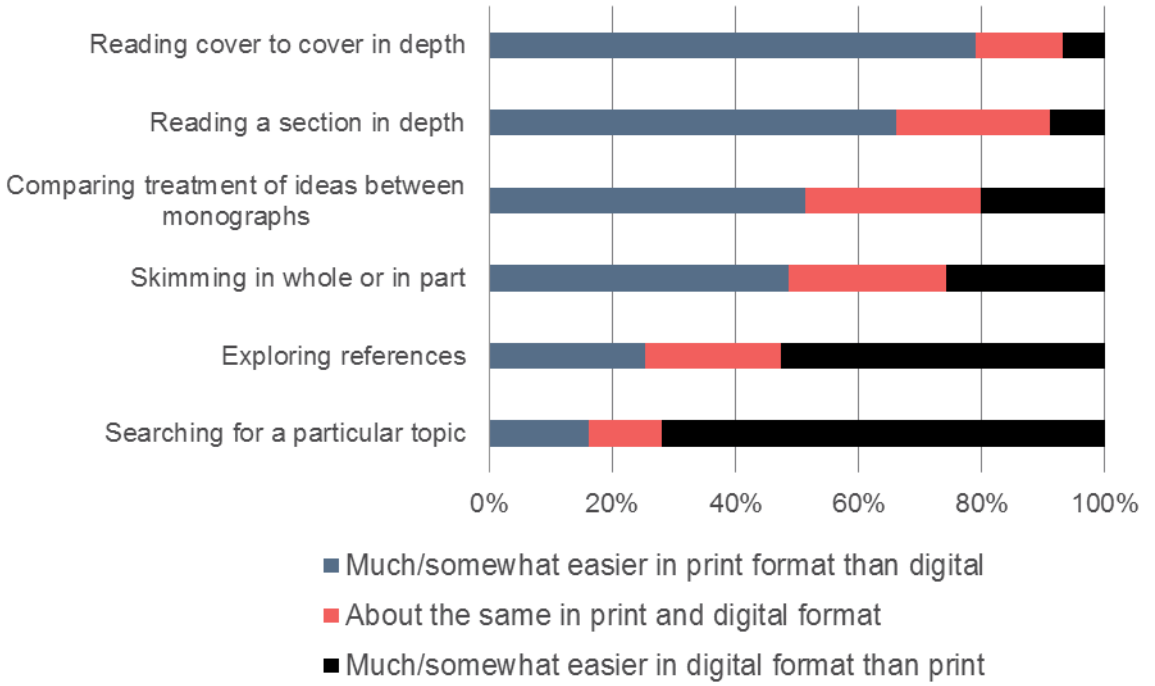
A small share of faculty members (only 18% overall) strongly agree that within the next five years, the use of e-books will be so prevalent among faculty members and students that it will not be necessary to maintain library collections of hard-copy books. Not surprisingly, as humanists have expressed the important role that print versions of scholarly monographs play in their research and teaching, they have the lowest levels of agreement with this statement as compared to their peers (see Figure 9). Since 2012, we have seen a negligible increase in agreement for humanists and social scientists, with a slightly larger (but still small) increase for scientists. Medical faculty members exhibit a substantially higher level of agreement than faculty members from other disciplines, with 32% of respondents strongly agreeing.

Figure 9: Percent of respondents who strongly agreed with the statement: "Within the next five years, the use of e-books will be so prevalent among faculty and students that it will not be necessary to maintain library collections of hard-copy books."



Respondents were asked to rate a variety of common activities performed with a scholarly monograph on a continuum between "much easier in print form than in digital" and "much easier in digital form than in print" (see Figure 10). Overall, there is a clear preference for print over digital format for most activities. However, over half of respondents identified that searching for a particular topic and exploring references was easier to do in digital format.

Figure 10: Below is a list of ways you may use a scholarly monograph. Please think about doing each of these things with a scholarly monograph in print format or in digital format, and use the scales below to indicate how much easier or harder it is to perform each activity in print or digital format. Percent of respondents who indicated that each of these practices is easier or harder in print or digital formats.



In comparing the results from 2015 to those from 2012, we have observed a curious shift in perceived ease of use of these formats (see Figure 11). For nearly all of the activities, with the exception of "reading cover to cover in depth," we have seen an increase in the share of faculty members that identify that it is much or somewhat easier to perform the activities in print format as opposed to digital format and, similarly, are seeing an across-the-board decrease in the share that finds it easier to perform the activities in digital format.

Figure 11: Change in percentage points of respondents indicating how much easier or harder it is to perform each activity in print or digital format from 2012 to 2015.

	Much/ somewhat easier in print format than digital	About the same in print and digital format	Much/ somewhat easier in digital format than print
Reading cover to cover in depth	-2.18	1.89	0.29
Reading a section in depth	5.84	-2.53	-2.91
Comparing treatment of ideas between monographs	8.54	-7.65	-0.89

	Much/ somewhat easier in print format than digital	About the same in print and digital format	Much/ somewhat easier in digital format than print
Skimming in whole or in part	8.82	-1.88	-6.83
Exploring references	10.29	-1.60	-8.70
Searching for a particular topic	1.20	-0.21	-0.99

As humanists have expressed an affinity for print versions of monographs generally, it is perhaps unsurprising that a larger share of these faculty members find it easier than their colleagues to perform all these activities in print format than digital format. Conversely, medical faculty members indicated a preference for digital format over print format as compared to their colleagues.

Concluding remarks

The findings from this cycle of the Faculty Survey demonstrate key shifts in the way that scholars discover academic literature, use print and electronic versions of resources, and view the role of the library in supporting students. As preferences and behaviors continue to shift, academic libraries, learned societies, scholarly publishers, and academia broadly will need to plan accordingly with appropriate support and strategy.

While findings from this cycle are a strong indication of the value of an ongoing tracking survey like this one, it is of great importance for colleges and universities to examine the specific needs of faculty members on their campuses. In this study, we observed a number of substantial differences in reported attitudes and behaviors depending on the respondent's type of institution, and when this questionnaire has been run on individual college and university campuses, we also see responses that deviate from what we have observed nationally.

Furthermore, beyond querying faculty on their practices and preferences, examining and analyzing actual behavior can provide institutions with additional crucial data for informed decision making. As academic libraries make important strategic decisions around investments in discovery services, maintenance of existing collections, and student support services, assumptions on the applicability of these national findings to one's own college or university should be examined and tested.

Acknowledgments

This paper, presented at the 2016 Library Assessment Conference, was adapted from the full Ithaka S+R US Faculty Survey 2015 report, authored by Christine Wolff, Alisa B. Rod, and Roger C. Schonfeld.[4]Endnotes

1. Datasets from Ithaka S+R's series of surveys may be found at http://www.icpsr.umich.edu/icpsrweb/ICPSR/series/226/studies.

2. Christine Wolff, Alisa B. Rod, and Roger C. Schonfeld, "Ithaka S+R US Faculty Survey 2015," *Ithaka S+R,* April 4, 2016, http://sr.ithaka.org?p=277685.

3. Prior to 2015, this response option was "your online library catalog." In 2015, this option was revised to incorporate the library website.

4. Christine Wolff et al., "Ithaka S+R US Faculty Survey 2015."

Reading Library Spaces: Using Mobile Assessment to Complete Your Library's Story

Camille Andrews, Elizabeth Hines, and Sara E. Wright
Cornell University, USA

Introduction

More and more, space on many college and university campuses is at a premium, and libraries are expected to show their value not only in terms of the services they provide, but also as a physical location. But are traditional library metrics providing us with a complete picture of how patrons are using the library? Do they tell the whole story? Gate counts and circulation statistics have often been used in library space assessment, but these broad measures, while useful for indicating how many people are in the building at any given point or how many materials are circulating, do not give a granular picture of how specific spaces in the library are used or what patrons are doing there.[1] Ethnographic methods such as interviews, photo diaries, focus groups, customer journey maps, or observations are useful for giving a more nuanced picture of library use but are often time consuming.[2] Newer technologies like GIS (geographic information system), video analysis, or heat mapping require specialized knowledge or technology and a fair amount of analysis to be useful.[3] Surveys or censuses of activity in the library can provide useful snapshots but are not useful for longitudinal research unless repeated.[4] Behavioral mapping (also known as seating sweeps/studies) and other more granular space observations can address many of these problems and be facilitated and simplified with the use of mobile technology.[5]

In this paper, we will detail the use of Suma, an open-source mobile web application, by the learning technologies team at Albert R. Mann Library at Cornell to inform and evaluate recently implemented space redesigns. Over the past two academic years, we have gathered valuable data on the use of our spaces, technology, and furniture, for a holistic view of what is happening in the library. We have also collaborated with students and faculty conducting their own assessments of the library to deepen our understanding of student study space preferences. We will share a selection of data from our most recent year of Suma use, discuss the initiatives we have developed, and show the changes we have made or are in the process of making that may help others who are considering utilizing this versatile tool. We will discuss the potential applications for Suma, as well as methods for improving an open-source assessment tool to enable easy data collection, and show how this information, coupled with other library data and external assessments, can be used to inform space and service decisions.

Suma

Suma is an open-source, web-based assessment toolkit developed by North Carolina State University (NCSU) Libraries for the purpose of collecting and analyzing observational data about library spaces and services. It allows for fast, mobile data collection, provides data analysis and visualization capabilities for non-technical users, and promotes observational data analysis as an integral part of service and space design and day-to-day planning. Suma adds value to gate counts and other traditional assessment methods by allowing us to: track observational data on how populated specific spaces are; tally, through customizable categories, what patrons are doing in specific spaces; and collect data over time, giving us insight into how space and service needs change.

We first began using Suma in our library during the spring 2014 semester. Initially, we used Suma for a number of initiatives, some of which were more successful than others. We attempted to do headcounts throughout the entire library six times a day, seven days a week, and relied heavily on student employees to do the data gathering. However, headcount collection dropped off midway through the semester (as the library and our student assistants became busier), and we were not able to restart it consistently. Through trial and error, we have found Suma to be most useful when we are trying to answer a specific question. For example, another early initiative was tracking the usage of our graduate study rooms. We had complaints from graduate students that our 24-hour loan period

for these rooms was excessive, as most graduate students were either working in the mornings and then leaving the rooms unoccupied for the rest of the day, or vice versa. By tracking the usage of these rooms four times a day, seven days a week over the course of a semester, we discovered that, despite being checked out, the study rooms were sitting empty almost 50% of the time. These findings resulted in us changing the loan period from 24 to 8 hours, and the following semester, the circulation statistics for these rooms increased by over 20%.

Our most intensive and longest running assessment has been a space usage initiative on the library's second floor. We began looking at our study spaces and user behavior a year before a major renovation of the study spaces, and then continued to track space usage for another year and a half post-occupancy. Suma made this longitudinal assessment of user behavior possible, and allowed us to see how users were interacting with the space, furniture, and technology we had installed during the renovation. Overall, it has been gratifying to observe the increase in usage and see that patrons are using the spaces and furniture the way we designed them to be used.

Results

Examining the 2015–2016 academic year—from August 31, 2015, to May 23, 2016—is instructive in terms of general trends on the second floor. Students and staff collected data according to the schedule shown in Figure 1, with no observations between December 21, 2015, and January 27, 2016, during winter break. Looking at the data for the fall semester, outliers like fall break the week of October 10–14, Thanksgiving break on November 26, and spring break the week of March 26–April 4 are also readily apparent (see Figure 2).

General trends included the increasing usage of the second floor during the fall, reaching a high of 650 people or groups on December 7 (the second to last day of study period before exams began), and the relatively reduced usage of the space during the spring semester, which saw a high of just 470 before spring break. In terms of areas of the second floor that saw the most usage, the main part of our second floor, with individual quiet and collaborative study, was most used (27,605); however, our reading room (Deans' Room) for quiet individual and collaborative work also saw a fair amount of use at 6,750 people or groups (see Figure 3). Patrons working individually were most common (28,412 people) as opposed to only 14,196 groups of two to four. Studying was far and away the most common activity, though socializing and "chilling"—e.g., watching movies, playing games, texting—also occurred frequently (see Figure 4). Our group tables for two or more people were our most popular furniture, followed by our soft seating such as couches and ottomans. Laptops were by far the most used technology (see Figure 4).

Improving Spaces and Services

These findings have resulted in us making sure that our furniture is arranged for groups of two to four, as well as making sure that our study spaces are arranged in "zones" for different types of activity, e.g., quiet study, collaborative work, socializing. Additionally, the premium on space during study periods, especially in the fall, has led us to begin investigating pop-up study furniture solutions that might alleviate space pressure during high traffic times.

We are not the only ones making plans to improve our library. During the fall 2016 semester, we were approached by students in a natural resources class called "Indigenous Ways of Knowing" who were working on a project that focused on the second floor of Mann Library. They were also interested in learning more about how students were using the spaces and "interacting with their environment," and they collected data through observations and short interviews. Amazingly, they even created a heat map of the second floor to provide data visualizations of the most popular study spaces. In exchange for our assistance—providing them with an overview of the assessment work we did for the second floor renovation—the student group was more than happy to share their results with us, giving us access to even more data than what we had collected with Suma, but which certainly corroborated our own findings.

Mann Library has also collaborated several times with classes and students from the Design and Environmental Analysis (DEA) department to assist with many aspects of the space renovation process, from programming documents and design, to furniture recommendations, to observations and interviews. Two extensive observation projects run with the aid of DEA students helped Mann Library to make changes to the library's collaborative area and quiet reading room, and demonstrated the importance of observation when making space changes. Their observations gave us valuable insight into creating and refreshing our spaces such as

student desire for natural light, the lack of signage and wayfinding so that students know collaborative space exists, and the idea that activity tends to breed activity—people need to feel comfortable being creative and talking about ideas in a space so that behavior is modeled for others to replicate.

Improving Suma

After our experiences using Suma over the past two years, we had suggestions for improvements to the data collection tool. We shared our frustrations with the limitations of the application with our user experience lead, who actually walked around with a number of staff who were collecting the data to see if there were consistent patterns of behavior among the users. The following customization plans were based on feedback and direct observations of our staff and student assistants using the data collection client (see Figure 5 for original interface):

1. Optimize screen real estate for counting.
    a. Minimize scrolling and push initiative and location selection off screen.
2. Add a multiplier button.
    a. Data collectors inherently scan space and group counts by likeness. This button allows collectors to record multiple counts simultaneously.
3. Ensure the current count is always visible and have a managed list of the most popular activities/configurations.
    a. This functionality fixes the scrolling problem introduced with a fixed header and footer.
4. Add a non-destructive undo button.
    a. The undo button was changed to restore submitted values so they can be altered without losing the count.

Collaboration with NCSU and the Suma Community

Our user experience lead felt very strongly that, because this was an open-source application, any improvements or customization we made to Suma should be contributed back to the project for use by the rest of the community and should align with the core team's project roadmap. Together with the original developers from NCSU, a new architecture for the client app has been developed (AngularJS), as well as support for non-WebKit browsers via a new DB abstraction (PouchDB). There is also a fork on the GitHub repository (https://github.com/cazzerson/suma) where those who want to contribute code to the project can do so by contacting the project organizers. For more information on how to get involved with the greater Suma community, visit the Suma project page: http://www.lib.ncsu.edu/dli/projects/spaceassesstool/.

Future with Suma

Training Documentation, Sampling Weeks, and Cross-Tabulation

Once library staff and students were properly trained in how to use Suma and what language was being used to describe particular scenarios, the data collection became much easier and much more reputable (see full training manual at https://cornell.box.com/v/sumatraining). After more than a full year of data collection post-renovation, we have decided that we now have a baseline to compare future data against and that we are able to transition in fall 2016 from collecting daily data to sampling weeks that will be representative of the semester. We can also export the raw data from Suma and combine it with other sources such as gate counts to see what ratio of people in the entire building end up on the second floor (which is our main collaborative work floor) to gauge our need for more collaborative work space.

Desktops

With the ability to shift from daily Suma counts of space usage to sampling weeks, we can now devote our student and staff time to other initiatives where we have been hoping to gather observational data. One area that we have had anecdotal data about, but nothing concrete, is the use of our desktop computers in the library, in particular, desktops with dual monitors. We think these machines are still heavily used, largely due to the variety of specialized software, but we would like to have actual data that can confirm or deny these suspicions.

Graduate Study Areas

Suma was extremely helpful in determining the loan period for our graduate study rooms, and we anticipate that it will be just as helpful in evaluating the occupancy levels of our graduate study area on the library's third floor. Our graduate study area is a designated zone for grad students with desks and lockers that can be reserved for a semester at a time. Once checked out, we do not know the frequency of desk use and whether that use varies by time of day, time of the semester, etc. Utilizing Suma to help collect this information will help us to make decisions on loan periods or adjustments to our policies.

Docking Stations

Another area that would be a perfect use for Suma would be the monitoring of the docking stations that we have throughout the library. Students often have a computer but lack a larger or dual screen to work with, so the library invested in four PC docking stations and four Mac docking stations with the hope of alleviating demand for the PCs and Macs that we provide. Anecdotally, we know that sometimes the docking station desks are being used just as study desks and the equipment is pushed to the side. Other times we see the docking stations used as they are intended. Using Suma would help us to move from anecdotes to actual data so that we can determine whether to continue this service, provide fewer or more machines, or provide only one type of docking station.

Conclusion

In this paper, we have tried to illustrate how simple observations can tell you a lot about how your library is being used and what your users' experiences are in those spaces. These are not intended to replace more traditional metrics, but rather, to enhance them and provide a more complete picture of your library. Our use of the mobile assessment application Suma has allowed us to collect and quantify this observational data over time, so we can see not only how users' needs change, but also how well our furniture, spaces, and technology are meeting those changing needs. Additionally, our collaborations with students and faculty have given us access to even more data, and have helped us learn what their concerns and questions are regarding our spaces. Our work with our user experience lead and NCSU developers will hopefully lead to improvements to Suma that will benefit anyone hoping to use this versatile tool to collect observational data that can impact services, staffing levels, spaces, and policies.

Figure 1: SUMA Observation Schedule for 2015–2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	11:00 AM	11:00 AM	11:00 AM	11:00 AM	11:00 AM	
2:30 PM	2:30 PM	2:30 PM	2:30 PM	2:30 PM	2:30 PM	2:30 PM
5:30 PM	5:30 PM	5:30 PM	5:30 PM	5:30 PM	5:30 PM	5:30 PM
8:30 PM	8:30 PM	8:30 PM	8:30 PM	8:30 PM		
11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM		

Figure 2: Daily Counts from August 31, 2015 to May 2016

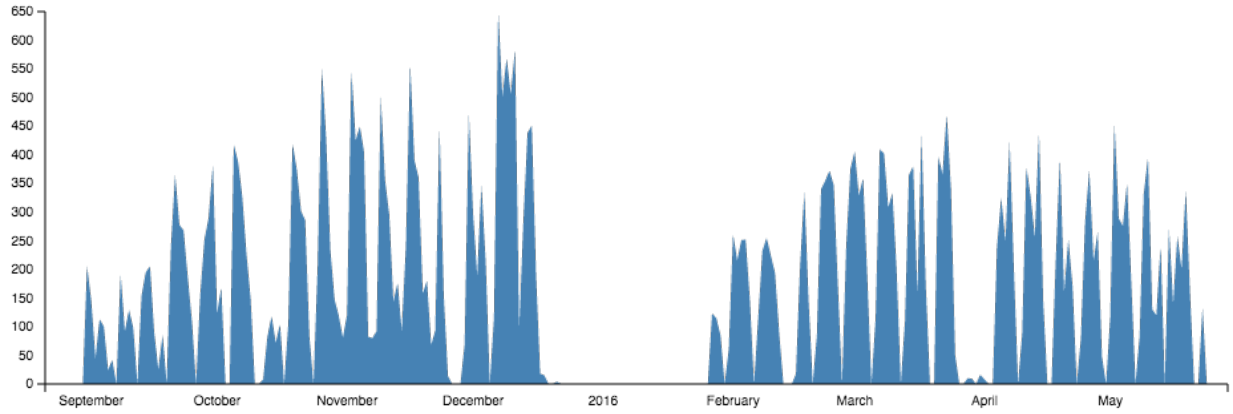


Figure 3: Usage of Second Floor By Area

Figure 4: Activities on the Second Floor 2015–16

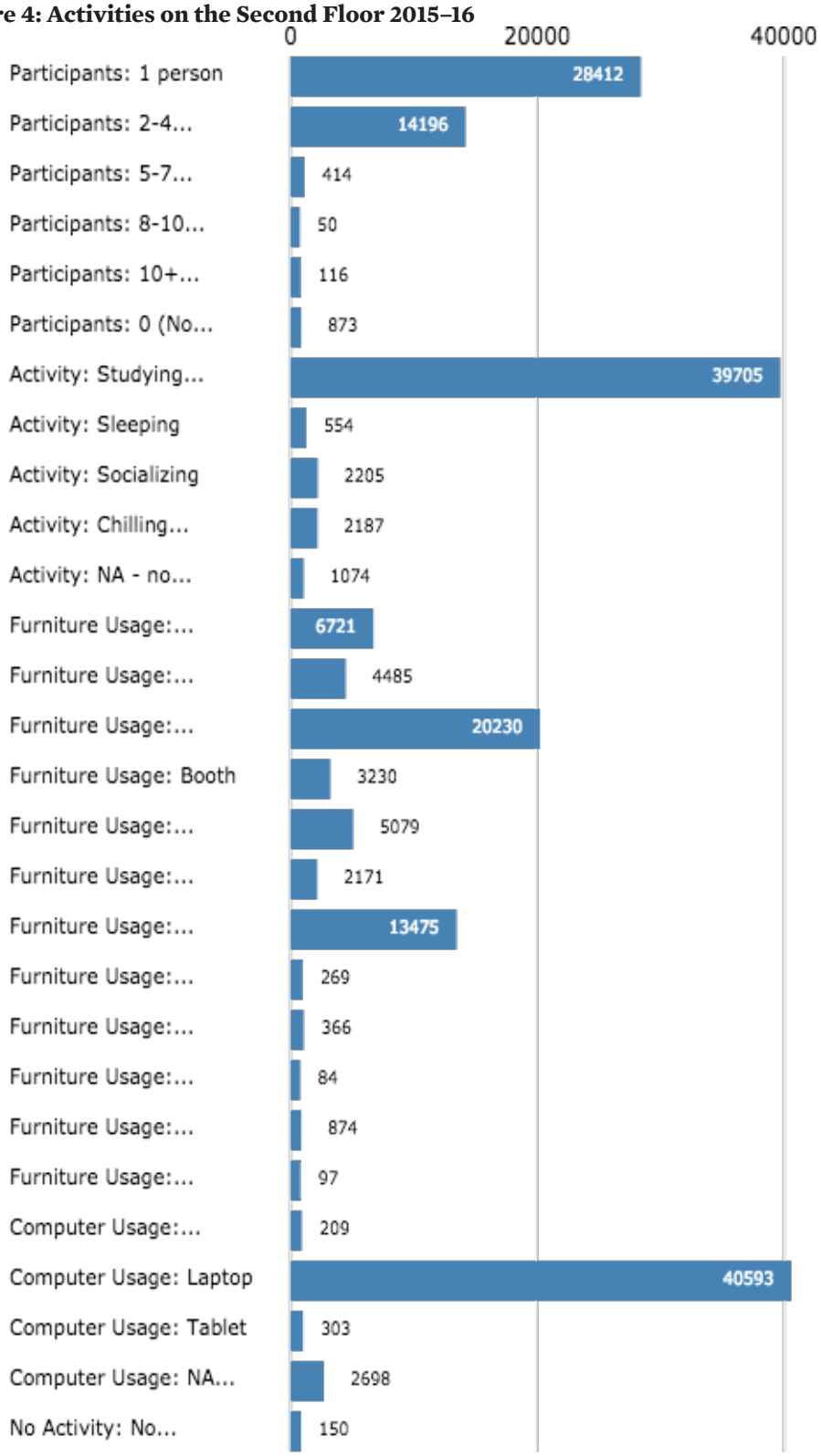


Figure 5: Original Suma Interface

Endnotes

1. Susan Thompson, "Using Mobile Technology to Observe Student Study Behaviors and Track Library Space Usage," Journal of Access Services 12, no. 1–2 (2015): 1–13, doi:10.1080/15367967.2015.972754; Christopher Stewart, "Building Measurements: Assessing Success of the Library's Changing Physical Space," The Journal of Academic Librarianship 37, no. 6 (2011): 539–41, doi:10.1016/j.acalib.2011.09.002.

2. Michael Khoo, Lily Rozaklis, and Catherine Hall, "A Survey of the Use of Ethnographic Methods in the Study of Libraries and Library Users," Library & Information Science Research 34, no. 2 (2012): 82–91, doi:10.1016/j.lisr.2011.07.010.

3. Jingfeng Xia, "Visualizing Occupancy of Library Study Space with GIS Maps," New Library World 106, no. 5/6 (2005): 219–33, doi:10.1108/03074800510595832.

4. Susan E. Montgomery, "Library Space Assessment: User Learning Behaviors in the Library," The Journal of Academic Librarianship 40, no. 1 (2014): 70–75, doi:10.1016/j.acalib.2013.11.003.

5. Thompson, "Using Mobile Technology," 1–13; Gricel Dominguez, "Beyond Gate Counts: Seating Studies and Observations to Assess Library Space Usage," New Library World 117, no. 5/6 (2016): 321–28, doi:10.1108/NLW-08-2015-0058; Joyce Chapman, Jason Casden, and Kim Duckett, "The Suma Project: An Open-Source, Mobile Tool Enabling Observational Data Collection and Analysis," Poster presented at the Library Assessment Conference, Charlottesville, VA, October 2012.

Evidence-Based Decision Making Using New Library Data

C. Heather Scalf
University of Texas Arlington, USA

Abstract

Evidence-based decision making is becoming more and more important across the academy and in libraries. University of Texas Arlington (UTA) Libraries implemented card swipe access in the Central Library as an opportunity to combine new data with other university data in order to make data-driven decisions about services and partnerships. The project has gathered data from library access points and university sources and combined them into a single secure database, linking student information such as major and classification and de-identifying the student ID number; this was then shared for analysis with the research team as a structured dataset. This analysis provided data pivotal to discussions with campus partners about new or continuing services.

Background

In the summer of 2012, UTA Libraries was joined by a new dean of libraries. Shortly thereafter, the libraries initiated wide-scale assessment projects to benchmark with peers across the country in several key areas and to learn more about users' research habits and the use of the spaces in various facilities across campus, including the existing five library locations. Findings from the space evaluation activities (affectionately called "Where's Waldo?") revealed that, while the traffic pattern was consistent with most academic libraries in that it resembled a bell curve throughout the day, there was a noticeable contingent who came into the Central Library late in the evening and stayed into the wee hours of the morning. Observations conducted during this ethnographic work showed that there were more than 300 people in the building at 2:00 a.m. over the three-week observation period. After sharing the results, university administration became very interested in partnering with the libraries to learn more about those using the facility as well as what activities they were engaging in while they were there. With the arrival of a new university president in 2013, funds were made available to add entry and exit gates using university identification card swipe access when the first floor to the Central Library was renovated.

The Project

Discussions about creating a database to gather and evaluate usage data from the access points began in earnest when planning for the renovation began. The libraries began to identify what would be needed to accomplish a secure merge of entry and exit data and demographic data about its students. The libraries are using the same entry and exit gate technology that is also used across campus for access to various labs and classrooms. There were a number of issues to address in the initial design phase of the project. First, most online resource datasets do not contain much if any demographic data about users, which is a positive thing when considering the need for patron privacy, but can be problematic when attempting to design a project that will incorporate data sources with different attributes. Library use data is stored in a number of disparate systems, many of which are vendor hosted or supported, and this allows for a variety of user identities, which complicates the connection and merging of data. The libraries have existing access to the university's Central Enterprise Directory and Authentication Realm (CEDAR), which populates the patron records in the Integrated Library System (ILS), Voyager. This access made it possible to leverage the data in order to create the project and build the database. The demographic information contained in CEDAR provides what is needed to begin to tell a more comprehensive story about library use.

Security of the data is a key consideration for the project, and no data could be gathered or merged until a secure server was procured and provisioned by our Office of Information Technology (OIT). Once this was made available, the systems librarian for programming and analysis began to create the database structures and scripts necessary to import and manipulate the data into LIBLAND (Library Learning ANalytics Database). Greater detail about the technical aspects of the development of the

database can be found in Michael Doran's recent Library and Information Technology Association (LITA) Forum presentation, and is available at http://rocky.uta.edu/presentations/.

Data and Security

Extensive measures have been taken to not only secure the database, but also provide cryptographic security of the unique 10-digit student identifiers that are used to link usage data from different data sources. As frequently happens when providing online library resources, there are several potential identifiers that are used by patrons to authenticate access. Each of these must be ascertained, linked to the primary 10-digit identifier in order to allow for analysis, and then removed from the exported Access database used for analysis. Before export, the unique 10-digit identifier is subjected to two separate and non-reversible cryptographic processes to create a 256 character string as the new unique identifier. The unique identifier is first put through a cryptographic random "salt" process, blending numbers and letters with the original string. This new character set is then subjected to a one way hash process to further de-identify the resulting 256 character string. This process is completed once for each semester's data, just after the first week of the following semester. It is then exported from the database and shared with the director of assessment for analysis in the form of an Access database.

As the project was beginning, the two principal investigators completed a protocol for submission to the university's Institutional Review Board governing human subject research. After a review of the protocol and many subsequent discussions about the encryption processes, it was determined that the LIBLAND project was exempt, based upon the category that identified it as research involving the collection or study of existing data, where the subjects cannot be identified, either directly or through unique identifiers. Throughout the project, great care was taken in the selection of the attributes that would be retrieved from the data sources. While the unique ID number can be retrieved, names of subjects cannot. Similarly, age is calculated and retrieved, but not date of birth and the zip code is made available for analysis, but not street address. These are but a few of the decisions that have been made in order to protect the individuals whose data is represented in the dataset.

Findings

Once card swipe data began to be merged in LIBLAND, the first goal was to determine not only how many entries we had to the building during a certain interval, a typical library question, but also the duration of visits to the library, as this would build upon the results of the earlier ethnographic work. While entry and exit data continued to support the bell curve distribution of visit counts, new patterns began to emerge from using the date/time element now available to us. Students who entered the library during typical business hours of 8:00 a.m. to 5:00 p.m. in April 2015 stayed an average of 80 to 100 minutes, but students who entered between 8:00 p.m. and 1:00 a.m. stayed more than 144 minutes on average. More details about this can be found on the UT Arlington Libraries Tableau Public page.

This information was of critical importance in our discussions with the food service vendor who operated the coffee and snack shop in the Central Library. Libraries' leadership was able to bring evidence to the discussions to show that students were indeed present in the library for extended hours during the overnight hours, and previous observations showed that food and/or drink were visible on the desks and tables for more than 60% of the observed students. The food service vendor then agreed to stay open and provide coffee and snacks until 1:00 a.m. five nights a week, resulting in a quadrupling of its sales.

A close corollary of this work was the first combination of demographic data with entry data to determine the percentage of visits from each school's enrollees. The result that 28% of visits to the Central Library were from the College of Engineering was particularly surprising, given that there is a library in the basement of the Science and Engineering building, and that the Engineering Research Building also includes a lot of study space. Analysis of the trends by hour of entry showed that while students enrolled in one of the other seven colleges or schools displayed the same general bell curve distribution, engineering students had a disproportionate increase in late night and very early morning entries. Subsequent observation of user behavior in the Science and Engineering Library led to our understanding that many students were migrating from there to the Central Library, as it was open all night. Based upon this, library administration agreed to extend the hours at SEL to 2:00 a.m. in order to better meet the students' need for space and

resources. Analysis of data from the current semester may reveal new or different trends in this area.

After this initial success, the project began to expand and other data sources were added to LIBLAND. Entry and exit information was joined by other usage data from sources such as Voyager, InterLibrary Loan (ILL), EZproxy authentication logs and our OpenRoom room reservation software. Each dataset was analyzed prior to the development of a load script and all of its particular attributes were screened before inclusion in the dataset. For instance, EZproxy logs include not only the student identifier but also the uniform resource locator (URL) of the resource that was accessed. Knowledge of this prompted the development of a script that truncates the URL while the file is loading so that the only remaining URL data available for analysis is the name of the source database and not the article title.

Analysis of EZproxy logs provided quantitative data to support the anecdotal evidence that our online-only students enrolled in the College of Nursing and Health Innovations (CONHI) accounted for a substantial percentage of the usage of our online resources from off campus. While the university had a global enrollment total of over 45,000, there are about 39,800 Texas-based students as of this semester, which reflects a growth of 7.3% since fall 2015. Just over 4,000 of those students actually live on campus. Meanwhile, CONHI enrollment increased by 23% between 2015 and 2016 and accounts for more than 23% of the courses offered during the fall 2016 semester. Evaluation of EZproxy logs showed that students enrolled in CONHI courses facilitated by our commercial partner Academic Partnerships (AP) use our resources at least as much as students in all other schools and colleges combined. This evidence was provided to the administration in order to develop a business case for the addition of a library fee for AP students to support the increasing costs of e-serials and other online resources.

In 2014, UTA was designated as a Hispanic-Serving Institution (HSI), with over 25% of enrolled students identifying themselves as being of Hispanic or Latino heritage. In addition to that, almost 67% of students enrolled for fall 2016 are transfer students. In 2015, the university received a $2.62M grant that will assist in the creation of a new IDEAS Center—for Innovation, Diversity, Excellence, Access and Success—as a resource to increase graduation and retention rates among Hispanic and lower-income students. This center is housed in the Central Library, as part of our second floor academic plaza. In order to get an understanding of the traffic flow and to staff for their opening in the fall of 2016, analysis of baseline data was provided to them. In the fall of 2015, 31% of the student entries to the Central Library were transfer students, and 20% of the total entries were students who identified themselves as Hispanic or Latino.

Looking Ahead

The conclusions that have been reached at this point in the project have proven useful in making a number of business cases within the libraries and with outside partners. Future work will include an analysis in 2017 to determine if there is any correlation between library usage and academic success, specifically grade point average. New data sources are being developed to be included in the database, and the libraries are a very active partner in the development of a university-wide data warehouse supported by SAS. As the university continues to focus increasingly on evidence from its academic units, the libraries' goal is to be an active partner in demonstrating how effective decision making can be done by providing evidence using data available in a variety of sources.

Correspondence concerning this paper should be directed to Heather Scalf, UT Arlington Libraries, Arlington, TX 76016. Contact scalf@uta.edu.

Driving the BUS: A Multimodal Building Use Study and Needs Assessment

Mandy Shannon
Wright State University, USA

Purpose

While the concept of "library as place" is a strong factor in the role of academic libraries, many libraries struggle with fitting the current needs of their students with a building that was designed in a time when studying, physically, was very different.

Wright State University Libraries finalized a new strategic plan in August 2014 that called for a revitalization of the library building. Specifically, the directive was to, "Revitalize the library building to accommodate the evolving needs of students, faculty, and staff, improving the visibility and accessibility of library resources." This seemingly simple directive led to a yearlong assessment project. The aims were threefold: to identify how the building is used in its current configuration; to compare the needs of library users and what is currently available to them to identify any gaps; and to identify ways to improve the library building to better meet the needs of users.

Design/Methodology

With a goal to conduct both a building use study and a needs assessment, the assessment team quickly realized that there were two separate components: the building use study required information about how the building is currently being used, traffic patterns, seating preferences, and more. The needs assessment, however, would be strongly prospective and would require information about users' preferences if they were not constrained by the current building design and layout.

This project began in the fall semester of 2014 and the final report was presented to library administration in January 2016. The first semester was dedicated to developing the study, pre-testing different components, and meeting with the director of the Office of Institutional Research for feedback on the project design. What developed out of these early planning sessions relied on multiple methodologies, divided into two phases.

Phase One—Building Use Assessment

Data Source One—Building use count

In the first phase of the project, during spring semester 2015, the assessment team focused on the current use of the library building. The first priority was to determine how many people were using the space, when they were using it, and how they used it. Each question, though, had a variety of accompanying questions that went with it. The assessment team knew that they would need to rely on sampling to conduct counts. It was important to get a sense of whether and how use of the building changed over the course of a semester, the course of a week, and the course of a day. We determined that the counts should be done two days a week, on Tuesdays and Wednesdays, to account for different class schedules on Monday, Wednesdays, and Fridays, and on Tuesdays and Thursdays. We selected six weeks of the 15-week-long semester to conduct the building counts, starting with the second week of the semester and culminating in finals week. For each of the two days during the six weeks of building counts, we conducted the counts at six times throughout the day every three hours, starting at 8:00 a.m. and ending at 11:00 p.m.

Once we had determined when to count, we needed to consider who to count. We knew that it was important to get a sense of how many individuals were in the building, but we also wanted to capture a sense of how they were grouped. Anecdotally, we had a strong sense that group studying was important, but we wanted to have a way to quantify the proportion of people who studied in groups and what size the groups tended to be. To capture both individual and group information, the assessment team determined that each time a building use count was done, there would need to be two individuals doing counts, with one focusing on individual use and behavior and one focusing on group size and behavior.

Another question that had to be answered in advance of data collection was what information we needed to record about what students were doing

in the library. Based on conversations with library administration and managers, we narrowed the focus to technology and furniture use. For each individual and group counted, a note was made of what type of furniture they were using (i.e., table, computer workstation, comfortable chair, or high table) and what type of technology they were using (i.e., library computer, laptop, both, or neither).

Finally, before counts could be done, the assessment team noted that there were different uses of the building based on location. The Dunbar Library is a four-story building that is set up for quiet study on the third and fourth floors and group work with fewer noise constraints on the first and second floors. Assessment team staff divided the library's second and third floors into zones, based on a variety of factors, including their intended use and actual noise levels.

The assessment team used Suma, an open source mobile tool developed by North Carolina State University Libraries. Suma is freely available software that is installed on a local server, run through a web browser, and works on mobile devices, making it easy to collect data. SUMA is a php-based application with a MySQL database. Once the initial questions about what type of information to collect about whom and when were decided, the assessment team worked with one of the library's web designers to set up the local Suma to be accessed on two iPads. The team conducted several trial runs with Suma during the fall semester in 2014 so that any issues could be addressed before the actual sampling began in spring 2015.

Data Source Two—Gate count

On the days that a building use count was being done, the circulation department also gathered hourly gate counts. The Dunbar Library has three public entrances, so information was collected about hourly traffic flows at each entrance. Because the three gates are bi-directional, gate traffic counts were used only to suggest building occupancy patterns, and not to draw conclusions about total building population at a given time.

Data Source Three—Whiteboards

While collecting data about building use through monitoring where students chose to sit and what technology they chose to use, the assessment team recognized that all the choices made by students were constrained by what was available to them in the building. We chose to incorporate some guerilla assessment methods to get students' attention where they were. On the days that counting occurred, library staff also placed whiteboards strategically around the library. Each whiteboard offered a forced choice (two different chairs, for example, or a laptop and a library desktop computer). The pictures were taped to the upper-left and upper-right corners of the white board with the words "I prefer" in between and the word "VOTE" underneath that. The white boards were left otherwise empty, but for a suggestion to "tell us why" in the middle of the board. Students voted using hash marks and left comments about why they preferred one option over the other, and indicated when their preferences were stronger and when they were contingent on what the student was doing at the time.

Data Source Four—Questionnaires

In addition to the whiteboards, the assessment team also designed questionnaires to be distributed on tables and study carrels throughout the building every day that the building use counts were conducted. These questionnaires were left deliberately vague and open-ended. The three questions were introduced with a simple statement, "We're counting [on] your point of view. We plan to improve the library study spaces." The three questions were, "What would you change?"; "What do you wish the library had more of?"; and "What is important to you when choosing a study space?" The questionnaires were color-coded and tagged to indicate what zone it was from, so that we could ascertain whether there were patterns based on where people chose to sit in the building. Once collected, the questionnaire responses were coded and tagged by category.

There were 386 completed questionnaires over the collection time frame. Because these were readily available throughout the library and at service desks, these responses do not necessarily reflect 386 unique users. Moreover, because of their distribution within the library, these collected responses only from existing library users. These questionnaires gave us preliminary insights into students' priorities and helped us shape the more comprehensive needs assessment survey in phase two.

Data Source Five—Photographs

Many studies have used pictures from the same location at the same times of day to capture different use patterns in the library. The assessment team did

take photographs of the main atrium from the same spot during each Suma building count, but also chose to include pictorial evidence to demonstrate uses of the building that were not easily captured by other data collection methods. We asked staff conducting the building use counts to take pictures of anything that stood out either because it was unusual (e.g., a group of 17 students that had pulled together four tables to create a super-sized table) or because it was representative of what they typically saw on the building counts.

Data Source Six—Wi-Fi access and computer log-in data

Based on a high number of student responses on the questionnaires that indicated a dissatisfaction with Wi-Fi quality, the assessment team worked with the Library Computing Services department to gather information about the number of Wi-Fi access points, the strength of their respective signals compared to industry standards, and average seating occupancy for each zone as it corresponded with the Wi-Fi access points. Additionally, LabStats were collected for the study period to determine how many individual users logged into the library computers each day, when peak times of use occurred, and the average length of a computer session.

In the summer of 2015, the information from the building use study phase of the project was analyzed. The assessment team used the information they had captured from that phase to develop the next phase of the project.

Phase Two—Needs Assessment

Data Source Seven—Campus-wide student survey

The needs assessment that developed focused primarily on a survey of students. Because the focus was on the library building itself, services and collections were included only to the extent that they interacted with how people use the building. The survey design included 39 multiple choice, Likert scale, and open-ended questions. The survey, administered through Qualtrics, and with the help of Office of Institutional Research was sent to all Wright State University students in the first weeks of the fall 2015 semester. There were over 1,394 responses to the survey, over 1,300 of which were complete and valid. With a student population of 18,059 in AY 2015–2016, this surpassed the recommendation of collecting at least 1,008 responses to make inferences with a 95% confidence level and a 3% confidence interval.

The sample was relatively representative of the student population. Full-time students were slightly overrepresented in the sample (85% of respondents compared to 77% of all students), as were women (64% of survey respondents were women, compared to 52% of all students). To a lesser extent, there was a small level of overrepresentation of students living in campus housing, as well as graduate students. The various colleges across the university were well-represented, with the exception of the College of Engineering and Computer Science; only 9% of survey respondents were enrolled in CECS, compared with 21% of the total student population.

Open-ended responses were coded and tagged by category. Cross-tab analysis of close-ended questions was done using SPSS.

Findings

Overwhelmingly, the findings of this study make clear that the library as a place must accommodate a variety of uses. In addition to the number of ways the library is used, and the variation in responses to questions, students often used the word “diverse” to describe characteristics they wanted in the library. Throughout the project, it was apparent that the library is many things to many people. Students demonstrated a great deal of thought and consideration in responding to questions about their preferences; it was common for responses to begin with, “It depends.” The building could be improved to address the ways it does not currently meet all of these needs.

- Students primarily study alone. When they do study in groups, they tend to be in groups of 2–4 people. Group work is not necessarily social or active. Groups congregate on the quiet floors of the building and work together, often on different projects, to be near friends.
- When studying alone, students prefer to study at tables. While some students use study carrels for privacy, most students prefer studying at tables because they provide the space to spread out.
- Quiet is critical to studying. Some students report coming to the library to socialize with friends, but students overwhelmingly look for a quiet place to study. Students are frustrated by the lack of quiet. Students commented that the open access to the atrium limits the ability of the 3rd and 4th “quiet” floors to be truly quiet.

The lack of privacy or quiet spaces is a concern for students for both individual and group work. Many saw the need for individual and group study rooms.

- Students want to study at the library on Friday and Saturday evenings. A substantial portion of students report that the library's current closing time of 6:00 pm on Fridays and Saturdays does not meet their needs. This is particularly a problem for students who work or have other daytime commitments. Current weekend closing hours have led to a perception among some that the library is not interested in supporting non-traditional students.
- The physical structure matters to students when studying. Students identified a need for more restrooms, especially on the first floor; cleaner facilities; more comfortable furniture; and a more aesthetically pleasing environment in the library. There was also a concern that the existing layout does not meet student needs. The layout was perceived as a "hodgepodge" that made transitions between service points onerous.
- Nearly all people in the library use technology—either the library's computers or their own laptops or tablets. Students identified a need for more desktop computers and printers placed throughout the building, rather than in one learning commons area. The changing nature of technology since the building was opened also poses a problem: there is a critical shortage of access to outlets in the building. Given that 80% of students report using their own laptops in the library, this is a concern not just for access but also safety. Cords are commonly stretched across aisles to reach between outlets and seats.

The findings were used to make recommendations to library administration about revitalizing the library building as part of the strategic plan. A complete, 74-page report with detailed analysis was presented to library administration, along with an executive summary. It is available at https://works.bepress.com/mandy_shannon/9/.

Practical Implications/Value

Using a wide variety of data sources allowed the assessment team to have a broad view of students' needs, use of the building, and perceived gaps between the two. This approach helped the assessment team and the library as a whole move from speculation about how the building should be revitalized to having a full picture of what student needs are, and to document that in a variety of ways.

In addition to collecting data from multiple sources, breaking the study into two phases allowed the campus-wide needs assessment survey to be more focused. By having done initial analysis on how the building is used, the assessment team was able to have a better sense of the types of questions to include on the survey.

Budget shortfalls across the university have put any plans to revitalize the building in a substantial way on hold, but library administration has been available for making decisions about the building from what furniture to buy to reconfiguring layouts. This report has also been used to demonstrate areas of need to the provost as well as a newly-formed committee on the Faculty Senate that focuses on the library of the future.

A large-scale building use and needs assessment study such as this is certainly a time-consuming, staff-intensive endeavor. Hundreds of staff hours were dedicated to this project over the course of 18 months. However, while it was very time consuming, the efforts resulted in a detailed, comprehensive report that is useful for both internal and external purposes.

Shh Stats: Mining the Library's Chat Transcripts to Identify Patterns in Noise Complaints

Jason Vance
Middle Tennessee State University, USA

"In this day and age, we do not want our libraries to be morbidly quiet."– J. A. McGrossan (1970) *American Libraries*[1]

Abstract

Library patrons at a large public university regularly submit anonymous noise complaints about their fellow students via the library's online instant message reference service. These virtual tattle-tales help build a data set of chat transcripts that allow librarians to analyze library use, traffic flow, and students' study patterns. This paper describes how one library's analysis of those chat transcripts was used to quantify the noise problem in relation to gate count numbers, identify patterns in noise complaints, and evaluate the effectiveness of designated quiet study zones. Using one academic year of the anonymous chat transcripts, the library was able to code each complaint by day of the week, time of day, week of the semester, and floor of the library. Furthermore, most online noise complainants were asked by the reference librarian to physically describe their specific location (for follow-up face-to-face shushing). This allowed the library to plot each complaint on a library floor map for further analysis and space planning considerations. This analysis has proven useful for addressing the competing student needs for quiet study space and collaborative learning areas. The library has also used the data in its considerations of quiet zone enforcement, signage, furniture placement and configuration, and the use of group study rooms within the library building.

Background

If you listen closely, you can almost hear the students' fingers on their keyboards as they type their anonymous noise complaints into the library's online chat service. An analysis of these chat transcripts reveals a trend of disappointment, frustration, and even outrage from users who come to the academic library seeking a quiet refuge as they study. This project seeks to identify patterns among the cacophony as it examines patron-initiated noise complaints from the "Ask a Librarian" online chat service at Middle Tennessee State University's James E. Walker Library, and aims to give voice to the anonymous patrons who are tired of hearing people's one-sided cell phone conversations, giggly flirtations, aggressive keyboarding, and amateur DJ sessions in the library.

The Walker Library designated the upper two floors of its four-story building as "Quiet Zones" during the fall 2009 semester in an effort to balance the competing interests of students looking for quiet study and those seeking more collaborative group learning spaces. The first and second floors were given no special designation, but the general understanding was that library staff would be more permissive of ambient noise in these areas. This new zoned approach counted on students to self-select their study areas based on their study needs so that library staff did not have to patrol quiet zones or actively enforce noise policies. Yelinek and Bressler note that this strategy appeals to librarians who are often reluctant to approach disruptive patrons.[2] This approach is further supported by research that shows students accurately self-select their acoustic study environment needs, and that academic libraries should offer multiple study environments to accommodate them.[3] Bell describes this zoning approach as a popular strategy for libraries to manage noise, but cautions that the effectiveness of quiet zones depends on student cooperation. He warns of scenarios in which "students will simply choose to not give a damn" and then "all hell breaks loose with library workers caught in the crossfire."[4]

The designation of the new quiet zones at the Walker Library was launched with much fanfare. The library installed new signage, posted updated policies, and launched a public awareness campaign through its online, print, and social media marketing outlets.

Interestingly, student noise complaints persisted after the implementation of the quiet zones. Students, now operating with an expectation of quiet, began reporting quiet zone infractions, quietly, via the library's anonymous "Ask a Librarian" online chat service. This peer-enforcement model, now channeled through the reference desk, unintentionally gave the library a new way to analyze noise complaints through chat transcripts. This analysis thus gave students a new virtual megaphone through which to offer their collective cry for quieter study spaces.

Purpose

The purpose of this study was to mine the transcripts of the library's "Ask a Librarian" online chat service in order to identify patron-initiated noise complaints and analyze these transcripts for patterns. Ultimately, the library hoped to use this new information to help balance students' competing needs for quiet study and collaborative group work in the academic library setting.

Methodology

MTSU's Walker Library began using SpringShare's LibChat platform to manage its "Ask a Librarian" chat service in the summer of 2015. LibChat allows administrators to export chat transcripts for a specified period of time. For the purposes of this study, the author downloaded all chat transcripts for one academic year (August 1, 2015 through May 5, 2016) into an Excel spreadsheet. This file contained 2,558 individual patron-initiated chat transactions.

The first step required the author to identify and sort out the noise complaints from the overall transcript file. The library had not given noise-complaints a unique code in the LibChat platform, so the author applied a keyword filter to the transcript file to find any transactions containing the following terms: loud OR nois* OR quiet OR talk* OR music OR complain*. Some false hits occurred for music reference related questions, so these were identified and removed from the filtered list. After applying this filter and removing duplicates, the author identified 115 unique patron-initiated noise complaints from the chat transcripts: 78 for fall 2015 and 37 for spring 2016.

The second step was to code the noise complaints in the Excel spreadsheet. The author was able to use existing data in the spreadsheet to code each transaction with the following fields: **transaction number**, **day of week**, and **time of day**. The date and time stamp information also allowed the author to code each transaction by the **week of the semester**. The author analyzed the content of the transcripts in order to code each transaction by the **floor** of the library in which the complaint originated. Once this information was coded, the author used pivot tables to compile summary counts of the noise complaints by day of the week, week of the semester, time of day, and floor. Using the library's gate count tallies, the author was also able to calculate the noise complaints as a percentage of total library attendance by each week of the semester.

The final step of the transcript analysis was to plot the noise complaints on a map of the library. Because each noise complaint required library personnel to physically intervene and "shush" the offender(s), librarians regularly asked for the exact location of the noise complainant. This often led to detailed descriptions of the location (e.g., "...third floor to the right, first table by the window"). Using these descriptions in the transcript file, the author was able to plot 104 of the 115 noise complaints on a map of the library.

Findings

One of the major implications of this study was that the library now had quantified data on which to base its discussions of noise and patrons' noise complaints. Heretofore, conversations were largely reacting to anecdotal evidence and intermittent complaints. Upon reviewing the findings of this study, the library observed three notable patterns:

Nights are noisier than days

Students reported more noise complaints in the evenings than in the daytime hours. Sixty-eight percent of the noise complaints occurred between 5:00 p.m. and 10:00 p.m., with 32% coming between 7:00 a.m. and 4:59 p.m. One limitation of this study is that the "Ask a Librarian" service is not staffed after 10:00 p.m., so the library's open hours between 10:00 p.m. and 2:00 a.m. (on Sunday–Thursday) were not considered. Even so, the evening hours when the library is more sparsely staffed yielded a significantly larger number of noise complaints than the daytime hours.

Most noise complaints originate in the quiet zones

Students using the library's fourth floor (a designated quiet zone) accounted for 63% of all the noise

complaints in this study. The third floor, another designated quiet zone, was responsible for 13% of the remaining noise complaints. Combined noise complaints from the first and second floors (which carry no quiet zone designation) represented 12% of the total noise complaints. The librarians speculated that patrons on the upper floors felt empowered to complain given the floors' quiet zone designation, and students on the lower flowers complained less because there were less expectations of quiet.

Fall is noisier than spring
Patrons' noise complaints were down 53% from fall 2015 (n=78) to spring 2016 (n=37). Library gate counts are typically lower in the spring semester, so the author compared the number of noise complaints to the overall gate count numbers. Overall gate count was down 16%, but this did not explain the sharp drop in noise complaints. The library made no special interventions in the spring semester, so there was no explanation for this drop in noise complaints.

Practical Implications/Value

Analysis of LibChat transcripts has given voice to quiet-seeking students and their complaints about noise. Moving forward, the library now has data on which it may center its considerations of quiet zone enforcement, signage, furniture placement and configuration, and the use of group study rooms within the library building. All of these considerations are weighed against the competing students' needs for quiet study space and collaborative learning areas. Two practical implications emerged from this study:

Group study rooms, public computing areas, and quiet zones do not make for good neighbors
Noise from the library's group study rooms and public computing areas accounted for 39% of the total complaints. The group study rooms are not soundproof, and noise from group study sessions often bleeds into the quiet zones. This friction of competing study dynamics might be alleviated by moving the designated quiet zone to another floor that has fewer group study rooms. The library is first exploring a less expensive proposition: new signage inside the group study rooms that remind occupants to be mindful of their noise levels and that the rooms are not soundproof. Similar courtesy reminders are posted periodically at the public computing areas within the quiet zones.

Noise complaints represent a small percentage of library users
The library received the most weekly noise complaints during week 15 of the fall 2015 semester. Twelve complaints in one week seemed like a lot to the library administration. But considering that gate counts recorded that 29,933 people visited the library that week, the LibChat noise complainants only represented 0.04% of the total library visitors. Most weeks, the complaints represented closer to <0.01–0.03% of total library visitors.

The library has also revised its noise policy to more clearly define "quiet." Library staff described anecdotal stories that suggested great variability in what people consider "quiet." The policy now describes examples of quiet behavior and specifically addresses whispering, music "leaking" from headphones, and cell phone conversations.[5]

Though the complaints come from a very small percentage of library visitors, the library recognizes that this count of library noise complaints is a conservative measure. This study acknowledges that not every student will take the initiative to submit a complaint when noise is a problem in the library. A separate 2012 library survey of 154 library patrons found that, while 52% of respondents identified the quiet zones as their favorite places in the library, 30% of the total respondents identified noise as a continuing problem in the library.[6] Also, some library users complain directly to the library workers and bypass the LibChat service. Finally, not all complaints are patron-initiated. Service desk staff and roaming security workers also intervene when there is excessive noise in the library.

Conclusion

The project provided a successful technique for mining the library's "Ask a Librarian" online chat service transcripts for patron-initiated noise complaints and provided baseline data on which the library can measure the effectiveness of its future noise-related interventions. The results of this study provide new information as the library seeks to balance students' competing needs for quiet study and collaborative group work in the academic library setting.

While the anecdotal evidence paints a picture of a raucous library environment, noise complaints actually represent a very small percentage of total library visitors. The study allowed librarians to

analyze the transcripts and identify noise complaint patterns by time, day, week, and location. These patterns show that most noise complaints are received in the evenings and most originate in the library's designated Quiet Zones, especially where Quiet Zones are in close proximity to group study and computing spaces.

Based on the findings of this study, the library is considering recommendations for adapting quiet zone enforcement for evening hours, additional signage in group study rooms and public computing areas near the quiet zones, reconfiguration of furniture placement in the quiet zones, and the possibility of installing sound absorbing panels in group study rooms.

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After the Ribbon Cutting: Creating and Executing an Efficient Assessment Plan for a Large-Scale Learning Space Project

Krystal Wyatt-Baxter and Michele Ostrow
University of Texas at Austin, USA

Introduction

In the fall of 2015, the University of Texas Libraries opened a new Learning Commons on the entry level of the Perry-Castañeda Library (PCL), the main library on campus. This project served to repurpose 20,000 square feet of what had been technical services staff space. While the Learning Commons includes some office space for liaison and instruction librarians, the majority is non-staff space. The spaces include the University Writing Center, five active learning classrooms with flexible furniture, flat panels and strong wireless, and a 44-seat Media Lab. Because the building is open 24/5, we designed the spaces so that they could be used the entire time the building was open. The University Writing Center is open as study space outside of regular consultation hours, and all of the classrooms are available as study space at any time we are not teaching. While we knew we would be working with the University Writing Center to do a longer term assessment about how the Learning Commons services impact student learning, we wanted to take some immediate steps to determine how well the Learning Commons was functioning for our students and our staff working in it so that we could quickly make needed changes to ensure its effectiveness going forward. In addition, because it was a high profile project for the campus, we wanted our assessment to help us tell the story of the Learning Commons in its first semester. This paper outlines the approaches we took, what we did with our results to close the loop, and practical implications and ideas for conducting similar assessments. We believe it represents an assessment model that could be adopted at other libraries opening new services and spaces.

Literature Review

Library literature includes examples of multiple methods assessments conducted on Learning Commons services and resources,[1] examples of large-scale surveys used to assess large-scale projects,[2] and examples of space assessments such as kindness audits.[3] Our approach was to take elements of each and combine them into one large, quickly implemented, actionable plan that would allow us to make fast changes while also generating compelling data to share with our stakeholders.

Designing the Plan

During the design phase of the Learning Commons project, the Steering Committee (which included a library facilities director and several public services managers) developed a list of questions that they wanted to be able to answer by the end of the first semester with the new space. This list was shared with the learning and assessment librarian, who drafted a mixed-methods plan designed to answer each question. We wanted to find answers such as whether students and faculty were using the space in ways that we anticipated through the needs assessments we implemented prior to building the Learning Commons, what aspects of the space were working well, and what we could improve upon. The plan included metrics such as gate counts and event attendance, surveys to learn about user perceptions, usability exercises, and staff focus groups. The goal in choosing methods was to provide actionable data to answer important questions. Keeping this goal in mind helped us weed out methods that could provide interesting data, but did not address a current question. For example, we decided not to have student staff perform hourly counts of users because door counts provided the level of detail we needed to determine use. Once methods were agreed upon by the planning team, the learning and assessment librarian and the head of teaching and learning services (who manages the Learning Commons) wrote a schedule of methods, and set to work on implementing them throughout the semester.

Media Lab

The media lab was designed to support students working on audio, video, 3D/animation, and graphic design projects and is staffed by student interns specially trained in the hardware and software. It is also designed to serve as a teaching space. We took a three-pronged approach to assessment in this

space. To begin with, we conducted a user survey designed to learn what users were doing in the media lab and how they felt about the space and its policies. The survey was implemented through a pop-up link on the lab machines that appeared five minutes after login, and received 166 responses in a four-week period. We also monitored usage statistics for the software installed in the lab. At the end of the semester, we conducted a focus group with the student interns.

Our assessment results gave us some quickly actionable items, such as adjusting the temperature in the lab since users found it too hot and adding some signs to make it clearer that it was a media lab and when it was booked for teaching versus open for general use. Usage statistics indicated that the software and hardware were being used and represented a good investment of IT funds. We were pleased and surprised to learn that in addition to class projects, people were using the media lab heavily for personal projects, a service to the campus we were not expecting. We also discovered it was a draw for computer science students doing coding and added XCode to the machines to support this use. Users found the student interns extremely helpful but at the same time they were not asking very many questions. As a result, we rethought how we used our student interns. We gave them some graphics and video projects that supported other areas of the libraries, such as development and communications, which they could work on during the time they were staffing the media lab. We also dedicated some of their work hours to completing those projects on a staff Mac workstation outside of the media lab. Another assessment finding indicated that while the media lab was very busy, people found it mainly by seeing it when they came into PCL. Potential users who did not regularly visit PCL would not know about it. We are working on more widely promoting it around campus and involving our interns in that effort.

Learning Labs

The Learning Labs, the active learning classrooms, are primarily used by libraries and University Writing Center staff for workshops, course-integrated instruction, and events, with reservations mediated by libraries staff. They represent a new kind of classroom on campus designed to facilitate pedagogical experimentation. All the furniture is moveable, there are flat panels or screens around the room, technology is in place to facilitate group work around a screen, and there is no fixed instructor station. Our assessment plan included tracking use of the space, tracking requested use of the space that fell outside of our initial policy, and conducting a focus group with people from the libraries and writing center who taught in the learning labs.

The learning labs were heavily used, with 229 reservations for classes, workshops, and events over the course of the fall semester. By tracking requests that were rejected, we learned that faculty were very interested in booking the learning labs for their own instruction and this gave us an opportunity to partner with them to foster pedagogical change on campus. As a result of our assessment, we added a service where faculty could book a learning lab up to twice a semester with sponsorship of a librarian to either take advantage of the technology or engage with the collections. We were guided by the 229 reservations to cap bookings at two per semester. That number also helped us come to the conclusion that we could not host semester-long classes in the learning labs in the fall. Since then, we have analyzed spring numbers and will host up to two semester-long classes during spring semesters.

Focus groups with staff who taught in the learning labs showed that people were very energized by the new spaces and inspired to change their pedagogical approaches. We learned that instructors often needed more support to use the learning labs and to troubleshoot technology than we had available and we were able to use that feedback to successfully advocate for a staff member dedicated to supporting the learning labs.

Space for Open Study

Opening up as much student space as possible was one of the most essential goals of the Learning Commons project. While much of the renovated space was used for our new classrooms, we felt strongly that design and policy should allow for students to use the space to study and collaborate when it is not reserved for classes. Since it would be easier in many ways to lock classrooms when not in use, it was important to assess whether students were making use of classroom and writing center space during off-hours.

We considered using observations as a direct method of seeing what was going on but since peak open study time occurs at PCL during the evening, it would have been inconvenient for staff to conduct

observations at these times. Instead we relied on more indirect methods. We installed a door counter in one of the classrooms to give us an estimate of general traffic patterns in the space. Beyond numbers, we wanted to know how students were using the space. To begin answering this question, we designed a series of posters to be hung in each classroom that asked students to provide feedback by answering multiple choice and short answer questions using provided dot stickers and pens. This method was adapted from one developed by Larry Lev and Garry Stephenson of Oregon State University as an alternative to interviews and questionnaires for gathering data in farmers' markets.[4] We liked the idea because it showed students that we are invested in what they are doing and want to make improvements, and invited them into conversation with us.

The posters showed us that, as we expected, the space was being used primarily by undergraduates. Students using the space reported that they were more likely to come to the Learning Commons to work with a group than to study or work individually. Each classroom is equipped with mounted flat screens that students can connect to wirelessly to display screens from their personal devices, but students reported using whiteboards about three times as often as flat screens. These findings showed us that, while students were largely finding the new spaces and using them in ways that we expected, there was room for further promotion and instruction in the use of the new technologies made available.

Sharing space with students, particularly overnight, means that staff who work and teach in the space must be flexible and understanding. Providing evidence of the value that students get out of the space when it is open for study helps soften the blow of the occasional mess and rearranged furniture.

Wayfinding and Space Usability

It was important for us to make sure that students could find their way around the Learning Commons, felt comfortable, and understood the different intended uses of the new spaces and technology. We borrowed an idea that reportedly originated in Michael Stephens' HyperlibMOOC class and has been used by various libraries since, and planned a "kindness audit" to be performed by student employees as soon as the space opened. For this exercise, we recruited student workers from across the organization and directed them to walk through the space taking pictures of what they liked, did not like, found confusing, and anything else that stood out to them. They then shared their pictures and observations with us in an online folder. This exercise revealed that students liked the general design of the space and all of the technology within it. They disliked areas that they saw as ambiguous in availability or intended use, and liked signs that clearly explain specified purposes of different Learning Commons areas. They also found navigation to be difficult, mentioning that the lettering labeling the Learning Labs was easy to overlook, especially when doors were open. These findings helped us make the case for adding additional signage and changing the classroom labels.

Informal staff observations revealed that after additional signage was added, fewer students asked staff at the library's main service desk where Learning Labs were located and students found instruction sessions more easily.

Practical Implications

Before we even received funding to build our Learning Commons, we knew that in-depth assessment would be part of its design and implementation. Once funding did come through, plans moved very quickly. While the architects were drawing up the plans, the Learning Commons Steering Committee came up with a list of questions that we wanted answered in the first semester, and devised a series of assessment methods that we hoped would answer them. Through this project, we learned the following lessons:

1. **Involve stakeholders in assessment planning.** Asking our stakeholders what they would consider a successful first semester of the Learning Commons helped us prioritize the kinds of assessment we launched immediately upon opening the space.
2. **Plan in advance to incorporate assessment into workflow.** While we worked as a group to prioritize which questions we wanted to answer immediately, one person was primarily responsible for implementing the resulting plan. Since assessment methods were chosen well in advance of the space being built, we knew about how much time to set aside to make sure assessments were carried out and analyzed in a timely manner.

3. **Employ mixed methods.** We found that some of our stakeholders are taken by examples and quotes, and others focus on charts and numbers. By using a mixture of methods to tell our story, we were able to provide a variety of evidence that showed our success and helped us make decisions.
4. **Show users that you are ready to act on feedback.** One of the main advantages of beginning assessment immediately is that we were able to make quick changes. This showed users that we valued their feedback and were committed to maintaining dynamic spaces and services. We build trust by following through on assessment.
5. **Use findings to grow and change policies.** During the initial semester, only librarians and writing center staff were permitted to reserve and teach in Learning Commons classrooms. Since demand for classroom space outpaced availability before the Learning Commons opened, we were not sure whether the new spaces could accommodate use by others on campus without negatively impacting our core programs. Immediately, instructors from all across the campus began asking if they could use the space. Usage tracked in our initial plan helped us decide to roll out a tailored program for limited numbers of non-library staff to teach in our space, highlighting our use of data to make decisions that allowed us to share resources when possible.
6. **Assign assessment tasks at a granular level.** Since the learning and assessment librarian was part of the unit in which the Learning Commons was housed, she worked closely with staff members responsible for managing and using each part of the space. This working relationship with constant communication allowed them to negotiate on the spot when there were questions about who was responsible for various pieces of the plan (such as getting permission to buy incentives for survey prizes or running reports on usage statistics), but in the future, we will assign responsibility for each task within an assessment plan. It is important to know who will provide data for each portion of the plan, when and in what format it will be provided, and who is responsible for using the data to make changes.

Detailing an opening-semester assessment plan ahead of time made assessment possible even when construction ran behind schedule and the semester became hectic. By focusing on data that would provide answers to important questions and that would allow for quick improvements, we streamlined our plan into a manageable workflow. Assessment plans are now written as part of every large-scale project in our library, and the information we collect allows us to craft a compelling story about what our new spaces enable our users to accomplish. Now that the Learning Commons is open and running, we are working with campus partners to do a study on the impact of collocated student support services on student success and retention. The positive feedback we got through assessing the opening semester gave us the confidence and practical experience to take our assessment efforts even further.

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Using Non-Library Student Collaboration to Inform the Design of a Library Family Room

C. Jeffrey Belliston and Holt Zaugg
Brigham Young University, USA

Abstract

Purpose: This study sought to identify the types of spaces, amenities, and policies that a family room should have.

Method: Using a graduate student and students enrolled in a Sociology 404 (qualitative research methods) class, the study sought to identify the needs of patrons with children by examining other family rooms at Utah Valley University and the University of Utah as well as family spaces and programs at nearby public libraries.

The study employed an online survey, observation, focus groups, and interviews. All results helped verify patron needs and suggested design.

Findings: The final results highlighted several key features for the family room, including specific features needed for this space. Specific features include furniture, technology, policies, floor designs, suitable environment, toys, technology access, and group study spaces. Policies include issues of safety, security, and cleanliness, as well as technology use.

Practical Implications: The project highlighted Brigham Young University's dedication to meeting student learning needs. This presentation will be of interest for academic libraries wishing to develop a family room or wishing to develop collaboration opportunities with faculty outside of the library.

Introduction

At the beginning of the fall 2015 semester, Brigham Young University's (BYU) Harold B. Lee Library investigated the need for a family room being placed within the library. The assessment sought to determine the following:

1. Is there a need?
2. What design features should a family room have?
3. What policies should govern its use?
4. What are some potential designs given the area is approximately half that of a basketball court?

Method

The study team based their recommendations on data collected through:

- an online survey of BYU students and faculty,
- focus groups with BYU parents, and
- observations and interviews at other libraries.

The online survey was administered to a random sample of students (undergraduate and graduate) and faculty to determine what percent of students and faculty had children, the ages of their children, and what amenities such a room should have. Using volunteers from the survey, focus groups were held to further understand family needs for such a space within the library. Finally, using partners external to the university, observations and interviews were conducted. The partners included patrons and employees of nearby public libraries and the libraries at the University of Utah (UU) and Utah Valley University (UVU).

Results

Survey results indicate that approximately 22% of all students and faculty have dependent children at home. Of this 22%, almost half are children of undergraduate students. Almost two-thirds of all reported children of BYU students are under the age of five. Consequently, we suggest that the room be designed to cater to parents of children under the age of five. The percent of children in each age group is listed in Table 1.

Table 1.
Percent of Reported Children by Age Category

Age (years)	Percent
Under 2	40
2–4	22
5–8	15
9–11	7
12–14	8
15–17	8

Qualitative data indicate that the BYU community is excited about having a family-friendly space in the library. A few examples of student comments expressing this excitement include:

- "... it's such a great idea."
- "Thank you for whoever donated... it's really hard to be a parent while being in school."
- "I think this is really cool by the way."

For What Will They Use It?

Based on the data, we expect the family space to be used for three main reasons. First, student parents will use the room to meet study needs. Sarah, a student mom, shared the juggling she and other student parents encounter. Sarah explained:

> So me and my husband are both in school right now so we switch off with my daughter a lot... sometimes I need to nurse on campus and it's hard to find a place that's close... And it would be nice if [my husband] was studying and he could just come in and be with us while doing that. Or having to print something and you didn't feel like you had to rush or that you were inconveniencing everyone around you and people were just like, "Get out with your baby."

Second, student parents will use the room to meet the needs of their children. Students expressed the desire to have a room that can (1) accommodate having sleeping children close by, (2) provide safe play and engagement opportunities (with toys different from those children have at home) to entertain children who are awake, (3) enable nursing or pumping milk in an appropriate space, and (4) have restrooms, drinking fountains, and furnishings that are comfortable for children. Such amenities co-located will help student parents to better use their time and better concentrate on schoolwork.

Third, parents will use the family-friendly space to meet their spouse and "switch off with kids between classes." Time is extremely valuable and, for parents, a place on campus where they can switch off childcare will ease the balancing act between work, family, and school that is necessary to complete their university studies.

What Does It Need?

To accommodate the needs for taking care of children while studying, the family room must provide a number of services. Based on the data, the research team developed the following conceptual underpinnings followed by concrete suggestions regarding features in, layout of, and policies for the family room.

Conceptual Underpinnings

This section refers to design and protocol features recommended for the family room.

Safety and Cleanliness

For parents to feel comfortable bringing their children, the family room must promote child safety from injury and illness. The rooms and its furnishings, including toys, must be regularly cleaned. Upholsteries should be easily cleanable. Hand sanitizer or sanitizing wipes could also be available for parents to use to clean surfaces and toys.

There should be open sight lines allowing parents to see their children, covered outlets and hidden cords, rounded furniture edges, toys that are not choking hazards, carpet to cushion falls, and reduced noise to promote child safety.

Open Design

An open design promotes the high-visibility sight lines previously mentioned and promotes ease of

movement. Parents must be able to easily supervise their children. There should be no vision-obscuring shelves, doors, or furniture between the parents' desks and play areas. An open design also promotes ease of movement for children in strollers and allows for parents to keep infants who are not mobile close.

Separated Sections
Distinct sections in the room will promote safety and success for parents and children. The family room should have distinct study, play, and personal needs (i.e., nursing and lactation) sections. Separate (but not strictly enforced) play areas for younger (up to 18 months) and older children (18 months and above) will promote child safety. These sections could be designated by different flooring patterns (see sample pictures in the appendix). For example, a kitchen area could be tiled while play and study areas are carpeted but with different carpets in these areas.

An Environment Open to Family Needs
Though library norms are changing, noise (especially noise made by young children) still violates academic library norms and food is not universally acceptable. Children make noise, especially when playing, and users of the family room must expect and be tolerant of this reality. Children must also be free to consume food provided by their parents. Mothers must be able to nurse or to pump breast milk.

Self-Contained Library Family Room
Needed amenities should be available within the room. The room should promote convenient study by providing access to group collaboration spaces, Wi-Fi, access to library computers for those who choose not to carry a computer with them, and a printer. The room should promote convenient care of children by including family-friendly restrooms and drinking fountains along with the aforementioned lactation/nursing space.

Publicity
An unadvertised room will likely become an underutilized room. It would be advisable to place the room in an already well-trafficked area. Doing this will be a form of natural advertising. Good room placement should still be complemented by well-placed signage. Direct promotion by various means (e.g., making colleges, advisement centers, and Women's Resources and Services aware of it; using social media; putting it on the tour) should also be done.

Features
Based on the research, we recommend that the family room include the following features.

Media and Technology
Modern education requires access to media and computing capability. The family room should facilitate student use of media and the use of student-provided computers. It should also include access to library-provided computers and a printer. For parents who are comfortable with children being entertained by media, an area where this can occur should be provided. The placement of such an area should be on the periphery rather than in a place of prominence. It would be good to provide educational media choices for use by children.

A Variety of Engaging Activities
Parents continually mentioned the need for children to be engaged or distracted by toys and activities so that student parents can focus on their studies. Focus group and interview responses on this topic can be categorized into four groups: (1) creative, (2) constructive, (3) educational, and (4) purely recreational. The room should also contain books or other learning activities. Toys could include dress-up materials, play kitchens, coloring and craft supplies, and a variety of building materials. Recommendations from the BYU preschool included climbing structures. Additionally, carpeting containing colorful patterns could provide a useful source of entertainment.

Comfortable and Functional Furniture
The family room should contain furniture that will help parents study effectively. Comfortable seating and desks or tables with enough space to spread out study materials are a must. Couches or comfortable chairs for parents would also be nice. Child-sized chairs and tables should be included. Comfortable seating for children and storage cubbies might be considered.

Kitchen Area
Parents have to deal with hungry and messy children. A small, simple kitchen—with refrigerator, microwave, sink, paper towels, trashcan, and drinking fountain—will help parents in this regard.

Bathroom/Changing Room Facilities
Librarians connected to family rooms at other universities said it would have been more effective to have family bathrooms within close proximity

of their respective rooms. Surveyed patrons agree. The family room should include a family bathroom. Mothers or fathers can take their child(ren) of either sex into the restroom without causing the discomfort or stress that sometimes accompanies taking a child into a restroom intended for the other gender. Bathrooms should contain changing tables and Diaper Genies. One focus group participant suggested including a machine that vends diapers. This could help parents who either forgot or who had fewer diapers than needed.

A focus group respondent said that child-sized toilets are "awesome when you are potty training." Besides a child-sized, manual-flush toilet (because, based on the experience of multiple parents, auto-flush toilets often scare young children), there should either be a sink (auto faucet sinks are considered helpful) mounted for children or a step stool provided for children to use a sink mounted at a standard height.

Layout

The data suggest that there should be an open layout overall with limited divisions. The more open the room, the more family-friendly and accessible it will be. Furniture placement needs to be carefully considered to provide the desired openness and maintenance of sight lines. Major things to be considered in the layout include age-appropriate and open play spaces, a separated entertainment area where media might be viewed, a lactation room, and group study spaces.

Age-Separated and Open Areas for Children

Parents are concerned that their children may be hurt while playing in the family room, either by toys that are not age-appropriate or by older children who do not know how to behave around younger—especially the youngest—children. These concerns can be addressed by having appropriate toys for different age ranges located in separate parts of the family room. Low dividing walls that the youngest children would have difficulty crossing, but that would still allow for parents to see their children, are advisable. Because such measures will lessen parental concerns over their children's safety, they will also promote more effective parental study.

Some parents suggested that the age dividing the two groups is approximately 18 months. Beyond that approximate age, children can mostly mix safely in a combined open play space. For parents with multiple children, this can be important since the ability to interact with siblings is comforting for some children.

Separated/Sectioned-Off Media Space

Many parents see age-appropriate media, viewable on a TV, iPad, or computer as an additional avenue to entertain or distract children while they work. Some parents find this unattractive. These differences suggest that a media area should be separated from the main play area with a glass or other partition so parents can see their children watching television as they work. Another parent-suggested alternative is to have "iPads that you can check out [that] you don't have to let your kid play with it if you don't want to but other people can." Any iPads should have protective cases and screen protectors and, for noise control, headphones could be provided.

Lactation Room

Nursing mothers may constitute a significant number of family room patrons suggesting the need for a distinct lactation room, containing comfortable (preferably rocking) chairs, separate from the bathroom(s). This will convey that nursing mothers need not be hidden in a corner of a bathroom but that they should feel respected, welcomed, and comfortable.

The lactation room should be comfortable both for mothers who prefer privacy and those who prefer greater openness. This might be accomplished by having chairs that allow for a mother to easily turn around and face the wall if they want more privacy or by providing optional curtain partitions.

Group Study Spaces

Group study spaces will be useful for parents. One respondent said that in a family room she would, *"be able to do meetings with a baby. 'Cause I'm in the Family Life Major so a lot of the…women have kids. And trying to find time to meet or a place to meet on campus is almost impossible if you have to bring kids with you. So this would be really good if there were more than one mom with kids."*

Given the suggested open layout for the whole space, the group study options in the family room might be modeled after the open-entry group study "rooms" that currently exist on the south side of the library's Learning Commons. Such group study spaces would be useful for parents who need to work with classmates while providing an option for families to

be together in one designated location. Open entry with glass partitions provides easy access to and maintains line of sight for both parents and children.

Policies
The research team examined the most frequently mentioned policy suggestions and utilized the data gathered from observations to compile a list of four policy recommendations for the BYU family room.

Parents are Responsible for Their Own Children at All Times
The family room will not be a daycare center. It is for use by student parents who, even as they study, will care for their own children. Parental failure to understand and accept this policy will lead to improperly supervised children who increase safety risks for themselves and other children. This will, in turn, lead to fewer parents who will bring their children to the family room. Establishing that parents are entirely responsible for their own children will help prevent these undesirable outcomes.

While many parents expressed the desire to have someone in the room watching their children while they study, quite a few others expressed that they feel responsible for their own children. One mother expressed that she would be uncomfortable and feel unsafe leaving her child with a library worker.

Security Called if Children Left Alone
Because the family room will not be a daycare center, parents must be aware that security will be called if children are left unsupervised. Both the UU and UVU have a zero tolerance policy regarding unattended children. This policy promotes child safety even as it reduces potential liability issues for the university. BYU should implement the same policy.

Clean Up After Yourself and Your Children
As previously noted, many of the parents surveyed and interviewed consider sanitation and cleanliness to be important. A clean-up-after-yourself-and-your-children policy, aided by appropriate things such as sanitizing wipes and Diaper Genies, will help to address this important issue. Parents should also be encouraged to not use the room if they or their child(ren) are sick. Together these will make for a more inviting space and a healthier campus.

Media Kept at a Reasonable Noise Level
In order for student parents to be able to study effectively, noise levels must be conducive to that. Multiple parental comments made this point in focus groups and interviews. Children at play are often noisy enough without adding unduly loud media. If the media choice is for a dedicated TV rather than, or in addition to, iPads or some other option, the volume level on the TV should be kept at a level conducive to study. One respondent stated that, "kids match the volume of the TV, so keep the TV volume low..."

Limitations of Study
Throughout the project, the research team tried to ensure reliability through providing recommendations supported by strong data with as few limitations as possible. However, not all limitations could be avoided. The following limitations on this research exist.

Few models could actually be observed in higher education settings. Both UVU and the UU library family rooms are relatively new and are different in a number of ways from what BYU plans. The bulk of observations and interviews came from local public libraries. However, most parents interviewed in the public libraries had not gone to the library for personal study and thus may not accurately represent the BYU student population.

The survey sent to a sample of BYU undergraduates, graduates, and faculty members had a low response rate. Of 3,667 surveys sent, about 800 people started the survey, and about 600 were screened out due to filtering questions. A more precise estimate of the number of children of students and faculty and their ages is not available.

Respondent responses in focus groups and individual interviews with BYU students were based on perceptions of a proposed library family room rather than on actual experience within such a room.

Conclusion
The family-friendly space is intended to be a place for student parents to bring their children to play while they study. To be a child-friendly and child-oriented space unlike any other on campus, the family room needs resources to meet the needs of the students and children. Drawing from observations, survey responses, interviews, and focus groups consisting of BYU students and faculty,

we recommend that certain broad concepts be implemented in the family room. These include:

- Safety and cleanliness
- An open design
- Separated sections
- An inviting environment for families
- Self-contained features
- Publicity

In order to best serve the needs of BYU students and faculty, the family room's features, layout, and policies should be considered with these broad concepts in mind.

Acknowledgements

We wish to acknowledge the hard work and dedication of Curtis Child, the Sociology 404 instructor, and the students associated with the data collection and analysis for this project.

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Camille Wilding
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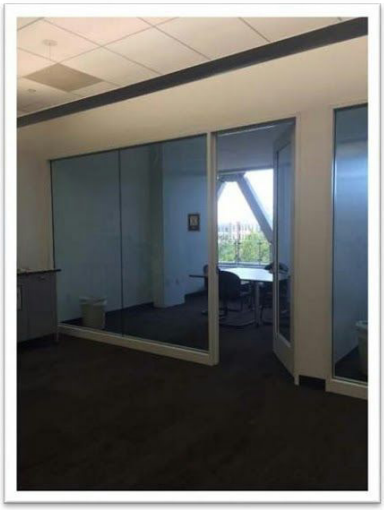
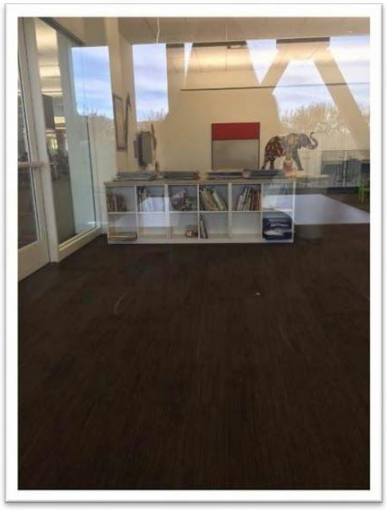
Appendix: Pictures of Potential Family Room Amenities

Figure 1: Clockwise from top left: University of Utah Library, University of Utah Library, Utah Valley University Library, Wasatch County Library

Parent Study Rooms:

- Glass walls enable uninterrupted line of vision for parents to see their children while working with peers in a quiet environment





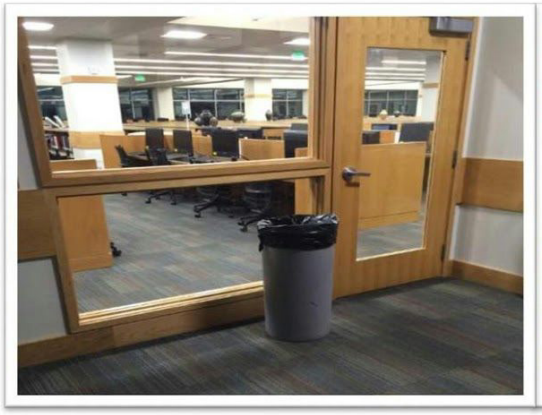


Figure 2: Clockwise from top left: Utah Valley University Library, University of Utah Library, Utah Valley University Library, Wasatch County Library

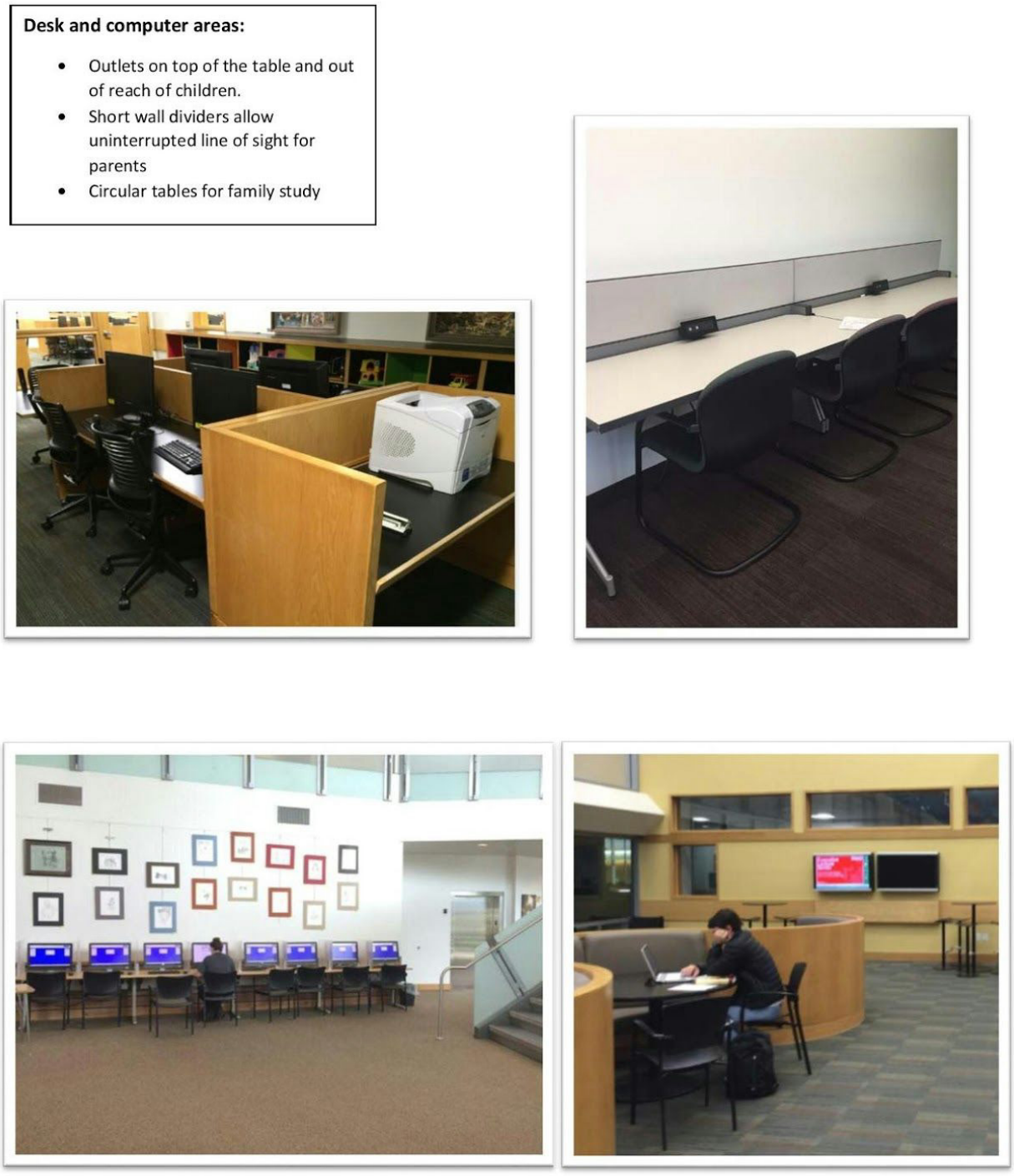
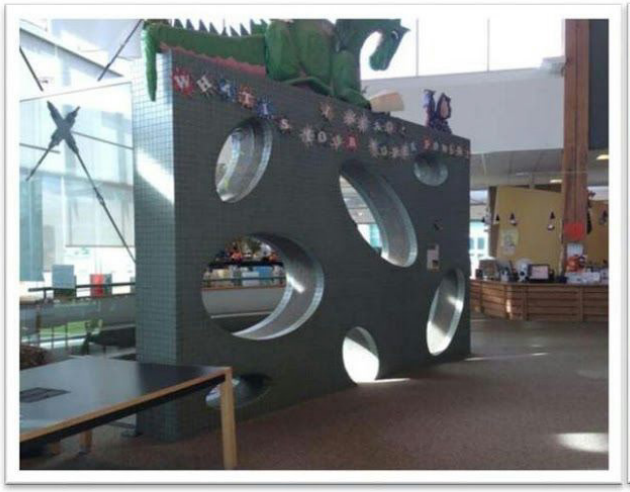


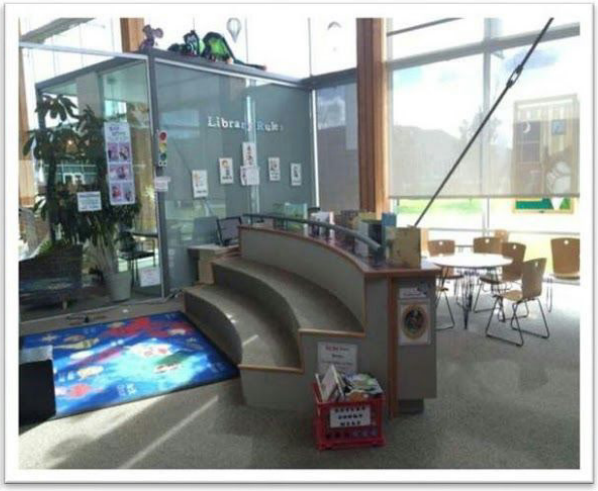
Figure 3: Clockwise from top left: Wasatch County Library, Wasatch County Library, Provo Library, Provo Library

Play Structures:

[Clockwise]

- A structure for children to play on and read in.
- A seating structure for story time.
- Soft benches for children to read on.
- Amphitheater structure for children to play in. If toys are placed in the middle of the amphitheater, the structure encourages children to stay in the circle.





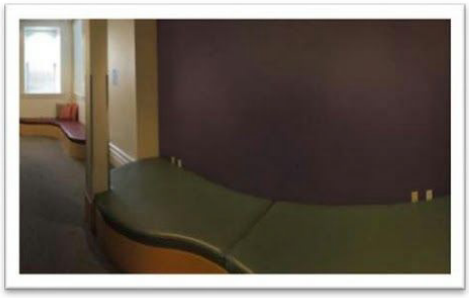
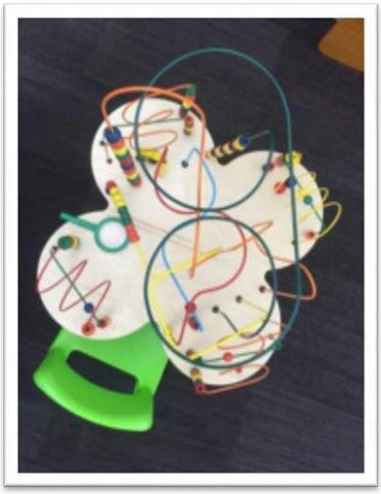
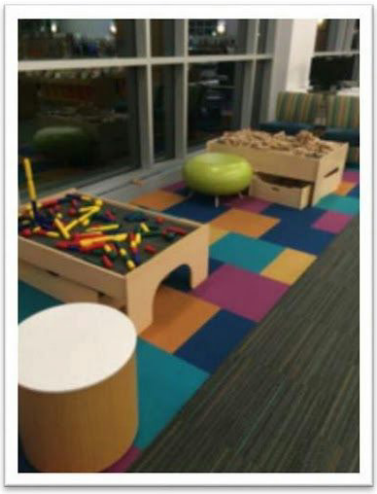


Figure 4: From the top from left to right: Wasatch County Library, University of Utah Library, Springville Library, University of Utah Library, Museum of Family History (Salt Lake City, UT)

Carpeting/Toys:

- Colorful carpeting engages children
- Immobile toy structures with various creative toys on top





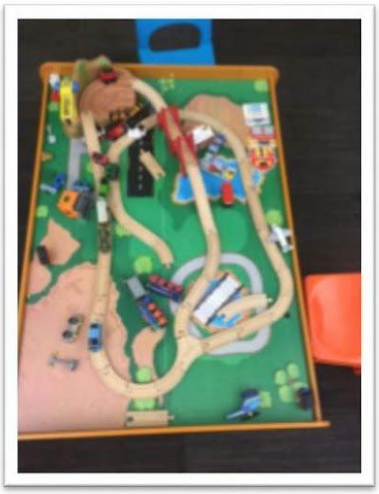
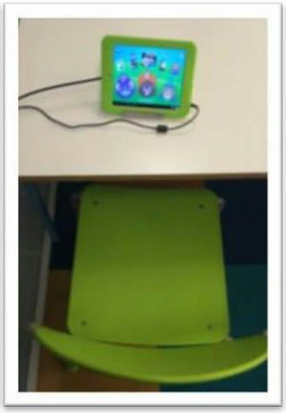


Figure 5: Clockwise from left to right: Provo Library, Wasatch County Library, Provo Library, Provo Library, Provo Library

Media Stations:

- Small chairs for children
- Colorful computers with interactive games installed
- IPad stations



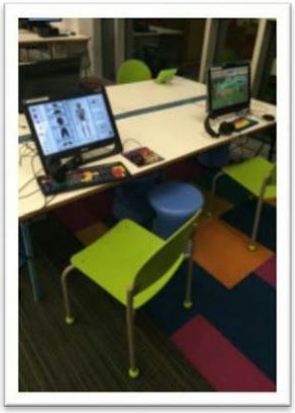


Figure 6: Clockwise from left to right: Provo Library, Provo Library, Utah Valley University Library, Utah Valley University Library, Wasatch County Library

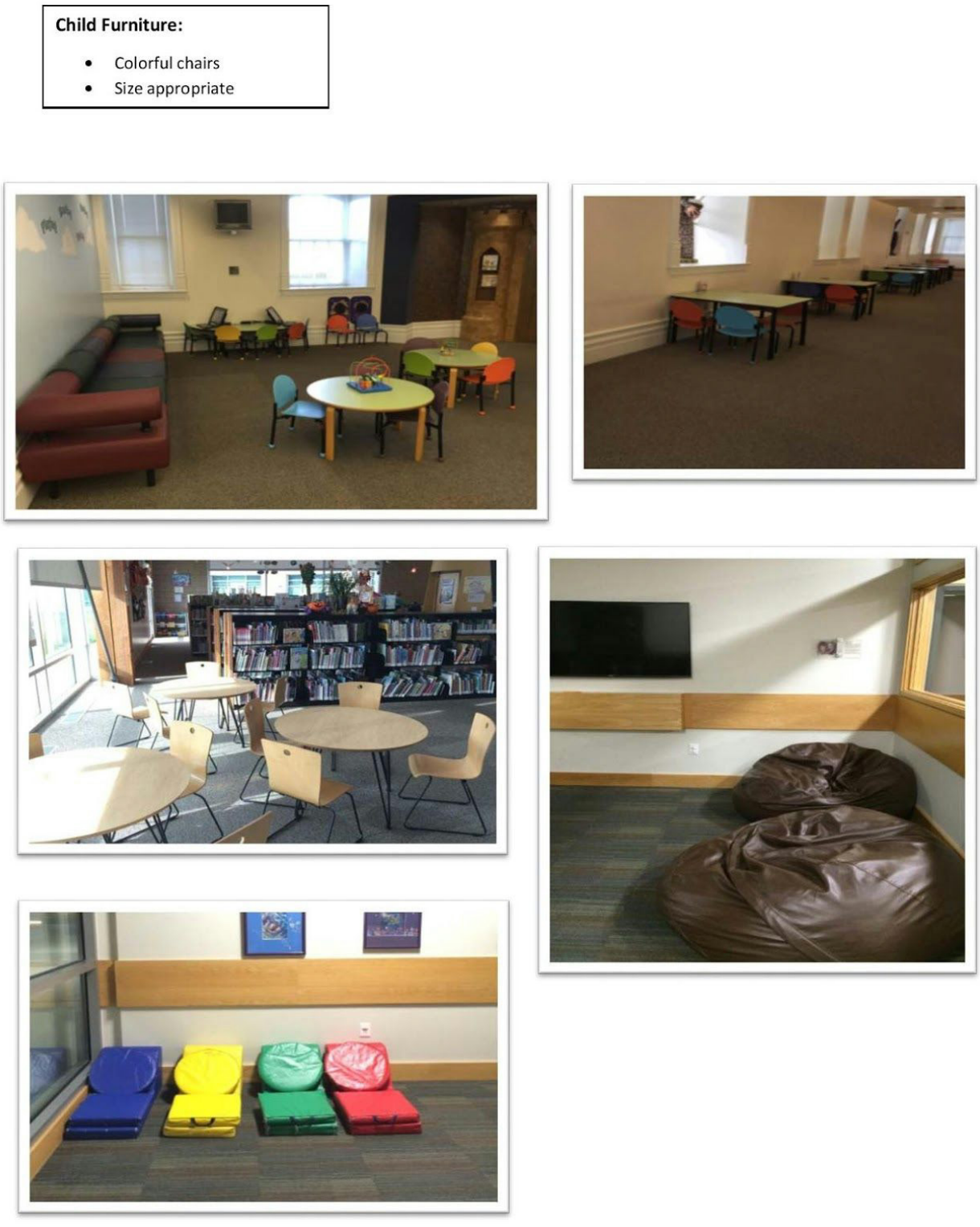
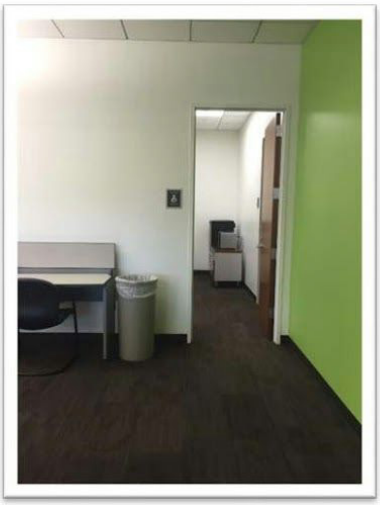
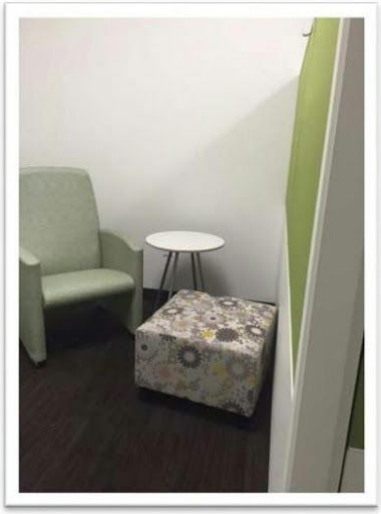


Figure 7: Clockwise from top left: University of Utah Library, University of Utah Library, University of Utah Library, Springville Library

Nursing Area:

- Microwave is for sterilizing pump materials or warming milk. Fridge for storing milk.
- Separate rooms for mothers who want to nurse in privacy
- Comfy chairs for mothers who want to nurse in the open





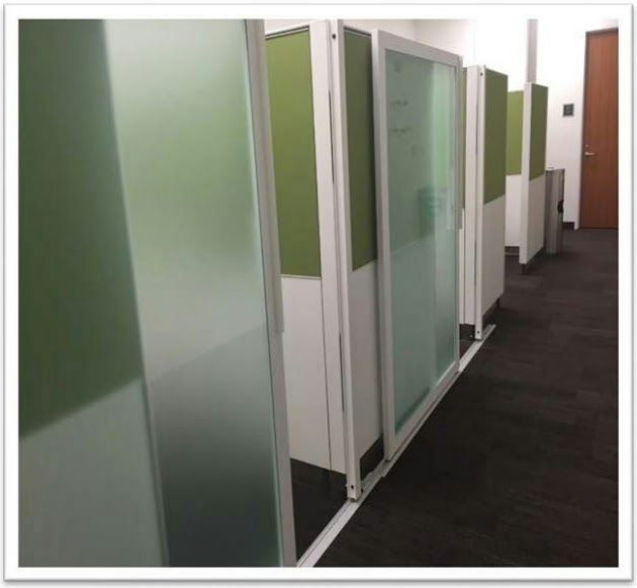
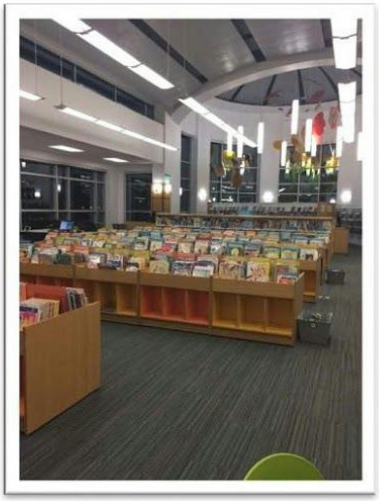


Figure 8: Clockwise from the left: University of Utah Library, University of Utah Library, Provo Library, Utah Valley University Library

Shelving options:

- Shelves should be short to enable parents to see their children over the shelves, and for children to reach the books
- One option is the book "buckets" (pictured right, bottom). This allows an easier system for kids to replace books when finished with them
- Shelves could also be used as toy storage (pictured left, bottom)



Building CORA, the Community of Online Research Assignments

Susan Gardner Archambault
Loyola Marymount University, USA

Abstract

This short paper chronicles the evolution of CORA (Community of Online Research Assignments), a pilot open access educational resource (OER) for faculty and librarians in higher education. CORA was developed through a Statewide California Electronic Library Consortium (SCELC) Project Initiatives Fund grant. The grant proposed to expand upon an internal information literacy assignment collection by using the "recipe" metaphor to envision the assignments as recipes that could be tweaked or easily adapted to fit into any information literacy curriculum. Input from two faculty focus groups was incorporated into the original prototype design.

The site was built using Drupal, an open source content management platform. Several small assessment studies were done to improve the CORA interface, including task-based usability testing, digital fly-on-the-wall observations, librarian interviews, and card sorting. The goal of the assessment was to improve CORA's search functionality and ease of use and increase CORA's relevance to instruction librarians. Key findings included a reluctance to log in or create a user account; a perception of the site as a marketplace rather than a community; a need to shorten the forms on the site and tweak unclear terminology; and a need for more practical "Teaching Resources," such as research guides. Please visit www.projectcora.org to see this new virtual community of practice.

Introduction

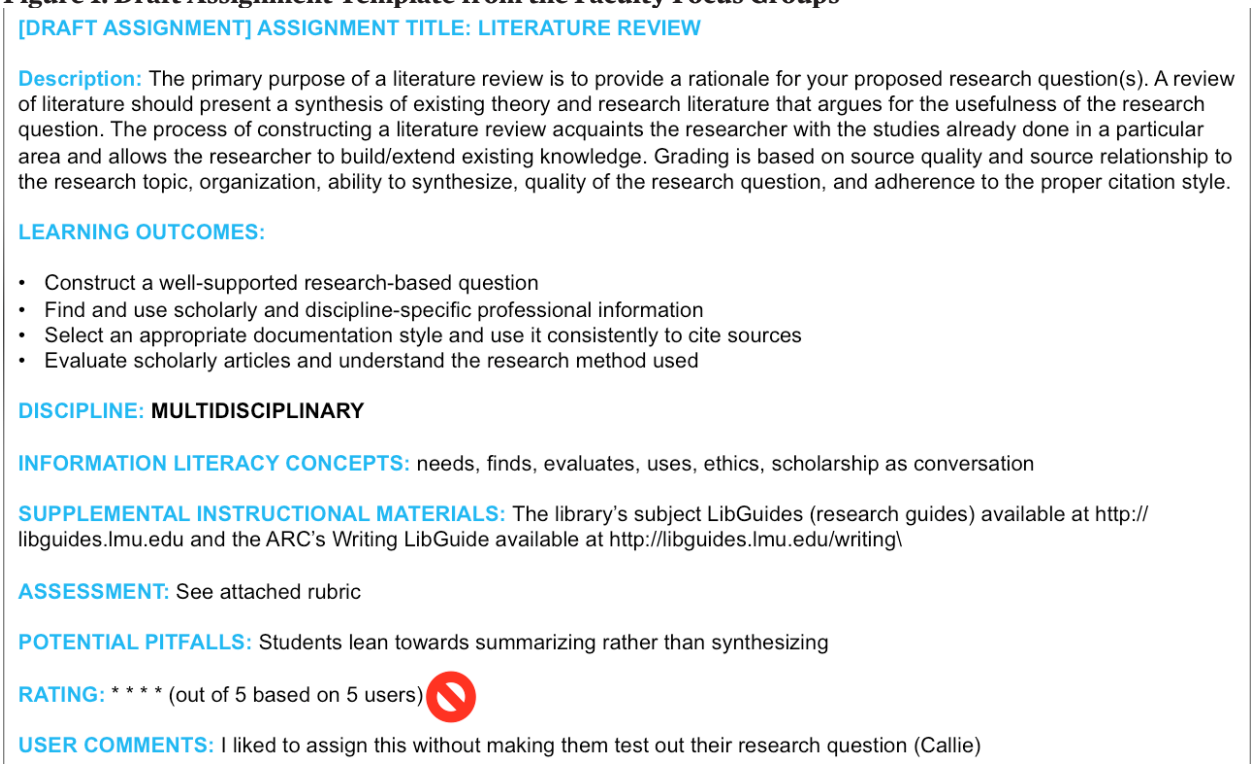
In 2014, Susan Archambault (the author) and Lindsey McLean, both librarians at Loyola Marymount University (LMU) in the United States, received a $5,000 Statewide California Electronic Library Consortium (SCELC) Project Initiatives Fund grant. The grant proposed to expand upon an internal information literacy assignment collection at LMU by using the "recipe" metaphor to envision the assignments as recipes that could be tweaked or easily adapted to fit into any information literacy curriculum. All assignments contributed to the collection would be released under an intellectual property license that permits their free use and re-purposing by other educators, allowing the assignments to be enhanced by user feedback in order to build a rich corpus of best practices. This paper documents the development of CORA, an acronym for the Community of Online Research Assignments. CORA is now an online space for the worldwide sharing and discussion of information literacy assignments and teaching resources (www.projectcora.org/).

Developing a Prototype

Susan and Lindsey conducted two faculty focus groups to gather input on the characteristics of effective research assignments and the desired features in a searchable, open access repository. They developed a draft assignment template for the focus groups to give feedback on (see Figure 1). Several recurring themes emerged from the focus groups that could be incorporated into the original prototype of CORA. One theme was the importance of modeling, or showing examples of the desired characteristics of a successful assignment and providing relevant resources to complete the assignment. Another theme was the importance of scaffolding, or allowing for successive levels of progress towards the end goal of an assignment or learning outcome. Examples of scaffolding included breaking up assignments into smaller steps that would build on each other, giving feedback early on by approving a research topic, or giving feedback on a rough draft. Several new fields were added to the "assignment template" in CORA to give more opportunities for modeling and scaffolding, including a "course context" field, a field for "additional instructor resources" such as in-class activities or worksheets, and a "criteria for success" field. Since the importance of peer learning was another theme that emerged, a filter for "individual" versus "group" assignments was added. Finally, faculty in the focus groups reacted negatively to the idea of letting users rate the assignments. This idea was scrapped and replaced with a feature called "I adapted this." We observed some generational

differences in faculty members' reaction to "open access"—older faculty members viewed assignments as their "intellectual property" and were more reluctant to share than younger faculty members.

Figure 1: Draft Assignment Template from the Faculty Focus Groups



[DRAFT ASSIGNMENT] ASSIGNMENT TITLE: LITERATURE REVIEW

Description: The primary purpose of a literature review is to provide a rationale for your proposed research question(s). A review of literature should present a synthesis of existing theory and research literature that argues for the usefulness of the research question. The process of constructing a literature review acquaints the researcher with the studies already done in a particular area and allows the researcher to build/extend existing knowledge. Grading is based on source quality and source relationship to the research topic, organization, ability to synthesize, quality of the research question, and adherence to the proper citation style.

LEARNING OUTCOMES:

- Construct a well-supported research-based question
- Find and use scholarly and discipline-specific professional information
- Select an appropriate documentation style and use it consistently to cite sources
- Evaluate scholarly articles and understand the research method used

DISCIPLINE: MULTIDISCIPLINARY

INFORMATION LITERACY CONCEPTS: needs, finds, evaluates, uses, ethics, scholarship as conversation

SUPPLEMENTAL INSTRUCTIONAL MATERIALS: The library's subject LibGuides (research guides) available at http://libguides.lmu.edu and the ARC's Writing LibGuide available at http://libguides.lmu.edu/writing\

ASSESSMENT: See attached rubric

POTENTIAL PITFALLS: Students lean towards summarizing rather than synthesizing

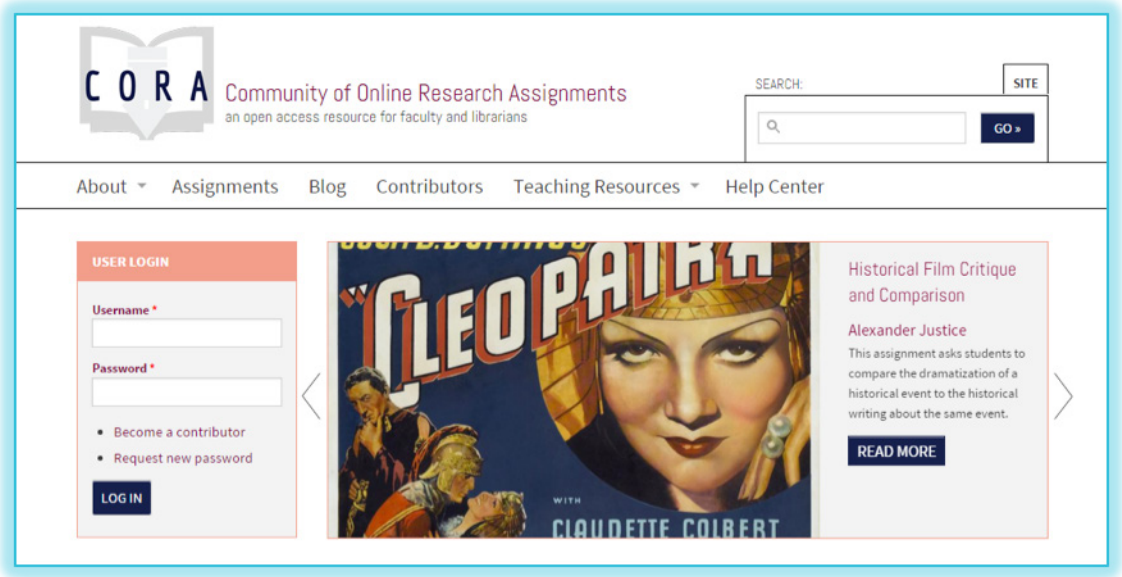
RATING: * * * * (out of 5 based on 5 users)

USER COMMENTS: I liked to assign this without making them test out their research question (Callie)

Once a draft prototype of the CORA website was finalized, The Cherry Hill Company (https://chillco.com) was contracted to build and host a live prototype of CORA. They used Drupal, an open source content management platform. CORA was further tweaked through biweekly online check-in meetings and an online ticketing system. Editorial standards for the CORA site were created in order to insure a standardized approach to writing style and workflow.

CORA was launched in January of 2016 (see Figure 2). The site contained assignments searchable by discipline, information literacy concept, ability level, or keyword. Assignments could be filtered by individual versus group and ability level. Along with assignments, there was a collection of teaching resources searchable by discipline, resource type, and keyword. A blog was included for site updates, and a help center was included for FAQs. Anyone could browse or search CORA, but only by signing up for a user account could you add an assignment, comment on someone else's assignment, use the "I adapted this" feature, and suggest a teaching resource.

Figure 2: Original CORA Homepage in January 2016



Methodology

A "CORA Development Group" was formed with fourteen librarians from different institutions to provide additional feedback on CORA. Development group members and other librarian volunteers participated in several small assessment studies run by the author, including task-based usability testing, digital fly-on-the-wall observations, interviews, and card sorting. The research questions the assessment studies were designed to answer are as follows:

1. How well are users able to find the results they need when searching for materials on the CORA site? How can their success be improved?
2. What is the information-seeking behavior of instruction librarians as they design research assignments? Which online resources do they use?
3. How can the ease of use be improved for CORA contributors?

Task-Based Usability Testing

Three librarians and one faculty member were assigned tasks in random order from a list of 10 task scenarios (see Table 1). They were asked to "think aloud" as they were completing each task. The three in-person sessions were recorded using Camtasia (www.techsmith.com/camtasia.html), and both the screen and audio were captured. One of the sessions was a remote session; WebEx (www.webex.com) was used to share the screen and Camtasia was used to record the session. At a later date, three more librarians were assigned the same tasks in random order to test a new version of the CORA homepage.

Table 1: Task-Based Usability Scenarios

	Scenario	Successful Completion
Task 1	Sign up for an account on the CORA site (www.projectcora.org)	Fills out the new contributor form and saves it
Task 2	Starting on the CORA homepage, search for and find one assignment that interests you. What is the name of the assignment?	Locates an assignment in CORA that is of interest using a search strategy (e.g., browse, search, related link, etc.)

	Scenario	Successful Completion
Task 3	Add a public comment about one assignment in CORA that interests you.	Adds and saves text in the comment box or “I Adapted This” section
Task 4	You want to get in touch with the author of one assignment in CORA that interests you. Show us how you could reach him or her.	Finds contact information of contributor
Task 5	You decide to use one assignment from the CORA site in your own class. How can you give credit to the original author(s) of the assignment?	Locates the information from the Help Center page “Citing an Assignment in Cora,” explaining how to cite a source in CORA in various style formats
Task 6	You have created the assignment in Appendix A that you want to share with others. Add your assignment to the CORA site.	Uploads the assignment file into CORA and/or fills out some of the descriptive or classification fields
Task 7	Starting on the CORA homepage, search for and find one teaching resource that interests you. What is the name of the resource?	Locates a teaching resource in CORA that is of interest using a search strategy (e.g., browse, search, related link)
Task 8	Suggest a teaching resource for the CORA site.	Fills out the “Suggestion Form” for teaching resources or e-mails the administrators a suggestion
Task 9	You want to help publicize CORA by talking about it on social media. Show us how you would do this.	Communicates with CORA’s Facebook account or Twitter account, or mentions CORA on a social media channel
Task 10	CORA is thinking about changing its homepage layout to the sketch in Appendix B. Circle what you find useful and x through what you don’t find useful. If you think something should be added to the page, add it with a sticky note. If there is something you don’t understand, add a “?” next to it.	Discusses what they find useful versus not useful and anything that is missing or that they do not understand

Digital Fly-on-the-Wall Observations
Two librarians were given two prompts and recorded for 20 minutes using Camtasia (both the screen and audio were recorded). The first prompt stated, "You are searching online for resources to help you with some upcoming library instruction sessions. Show me what resources you use to help you plan for your library instruction and how you use them." Participants were told to work on this prompt for the first ten minutes and switch to a second prompt for the last ten minutes. The second prompt stated, "Go to the CORA (Community of Online Research Assignments) website: www.projectcora.org and explore it as a potential resource to help you with your library instruction."

Interviews
Two librarians were interviewed and asked the following questions:

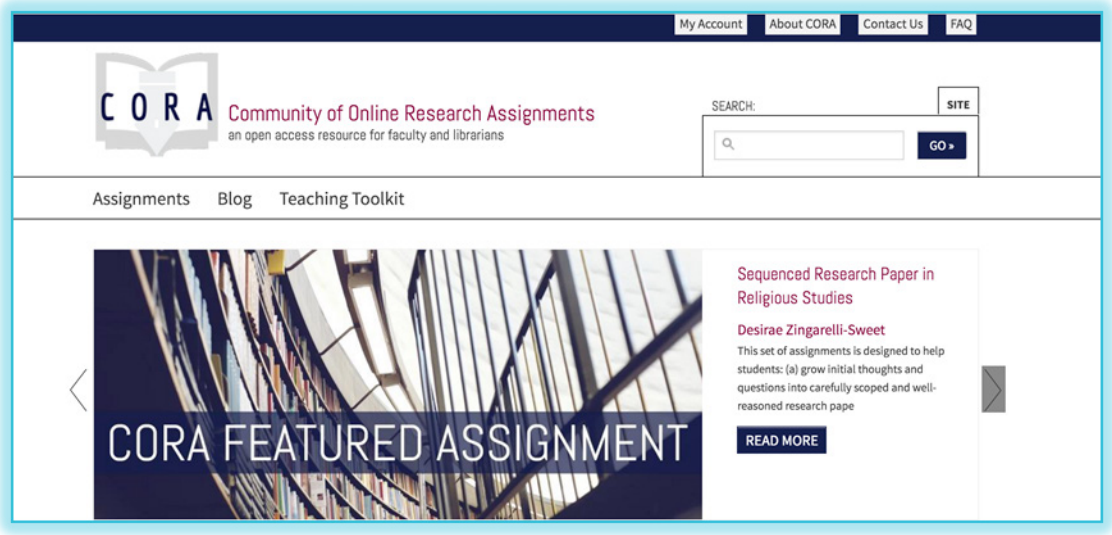
1. Tell me about a time when you found something useful online that helped you prepare for library instruction. Why was it useful? What do you like least about it?
2. Are there other online tools that you use frequently to prepare for library instruction?
3. How do you discover these resources?
4. Have you ever used the CORA site before?
5. When did you last log into an account on any site (e.g., Facebook) and why did you sign into your account?
6. What other ways might this site (CORA) fit into your work?

Card Sort
Ten librarians and faculty members participated in an online closed card sort activity through Optimal Workshop (www.optimalworkshop.com). The activity tested pre-defined "teaching resource" categories by asking participants to sort a list of 27 teaching resources into one of ten categories that made sense to them. Examples of the teaching resources included "PRIMO database," "VALUE rubric," and "teaching strategies column." The ten pre-defined category options for each item were pedagogy/theory, research study, assessment, activity, citation tool, technology tip, opinion, digital learning object, subject guide, and don't know.

Key Findings and Implications

Findings Related to Search Functionality
Subject tag search problems emerged due to the inconsistent tagging of some assignments. Multiple librarians from different institutions are allowed to create their own metadata "tags" for submitted assignments, but there needs to be more standardization. Problems of incompleteness with the main search box results emerged as well. Results need to include all subject tags and contributor names and label where each result comes from (e.g., Assignment, FAQ, Teaching Resource). Users had trouble figuring out how to cite an assignment in CORA, so a citation for each assignment needs to be automatically generated and appended to each assignment. The site was perceived as too cluttered, which was addressed by moving some links to the upper right corner to free up space (see Figure 3). Unclear terminology was discovered and fixed ("request new password" was changed to "reset password," and "apply" was changed to "search" as the command to run a search from within the assignments, blog, or teaching toolkit sections). Several broken links were also fixed.

Figure 3: Revised Design of CORA Homepage



Findings Related to Information-Seeking Behavior of Instruction Librarians

Librarians prepared for library instruction by looking at library resources and applying search techniques for a specific research topic or subject area. They did not search for pedagogical learning theories or active learning ideas. When using CORA, they gravitated towards the *assignments* section rather than the *teaching resources* section. More practical resources were added to the *teaching resources* section of CORA, including citation tools and research guides. Assignments should be searchable by full text to pick up specific research topic searches. The "teaching resources by subject" results could be integrated into the "assignments by subject" results so users do not miss them. The "teaching resources" link was renamed "teaching toolkit" to be less generic, and the teaching resource types describing only formats of research output without describing the content were eliminated (e.g., "textbook," "presentation").

Findings Related to Ease of Use for Contributors

Both the "user account" form and the "assignment" form were too long. The forms will be shortened so that optional information is on the next page. Also, the long wait time for account approval was eliminated by implementing automatic approval of all users who sign up with a .edu e-mail account. Users generally viewed the CORA site as a marketplace for exchanging assignments rather than a community. To combat this, the "I adapted this" box was moved from the bottom of an assignment to the top left side for greater visibility. Users were reluctant to sign into CORA and preferred to search and browse without an account. With this in mind, Twitter and Facebook login options will be added for easier sign-in. Also, the "I adapted this" box is now visible without logging in, and anonymous comments will soon be allowed. An internal messaging system can be created to better facilitate a community. It will allow users to contact the author of an assignment, and it will notify authors if their assignment was adapted.

Conclusion

This paper describes the evolution of CORA, an open educational resource (OER) for librarians and faculty in higher education. Several assessment studies resulted in improved search functionality and ease of use, as well as increased relevance for instruction librarians. The current collection of assignments and teaching resources will be enriched over time through additional user feedback, leading to a reliable and reproducible collection.

Susan Gardner ArchambaultLoyola Marymount University, Los Angeles, CA, USA.
susan.archambault@lmu.edu

Adventures in Framework Assessment

Anne Grant and Camille Cooper
Clemson University, USA

Abstract

Establishing a relationship between library instruction and student success is tricky at best. This paper presents the findings of librarians who created student learning outcomes based on the ACRL Framework along with assessment instruments that sought to show the positive relationship between library instruction and student success in particular classes. These librarians were not experts in assessment, but were determined to learn how best to show this relationship and also to improve sessions in which professors invited them to teach source evaluation and resource awareness. The librarians will describe the faculty contact made and how classes were designed using the framework as a guide. They will also include details about the assessment instruments designed and implemented as well as results indicating a positive relationship between the library instruction session and the students' perceived ability to apply what they learned to their class project or assignment. Specifically covered will be an English class in which librarians led students through separate sessions at two-week intervals. The first session saw students defining basic concepts such as research, primary sources, and secondary sources, as well as having hands-on exposure to different databases. Subsequent sessions were designed to help them learn search techniques within the databases and address any research skill deficiencies gleaned from their feedback on the previous session. The other class discussed is a geography class in which the librarian led students through an activity designed to help them learn how to evaluate sources and recognize different sources of information. These results will be useful to other librarians as they will learn the steps these librarians took to apply the ACRL Framework and how the results of the class assessment helped them both to show their positive impact on students and also provided feedback on improving future sessions.

In the fall semester of 2015, a faculty member reached out to both the English and history research librarians at Clemson University[1] with a daunting request: one or two library sessions for her students in the spring covering more than 15 databases, sophisticated keyword searching, and a few specific library services. The ultimate goal for the students was to help the professor curate an online exhibit similar to those produced by the Lowcountry Digital History Initiative[2] at the College of Charleston. These particular library instruction sessions were to be a part of a Creative Inquiry course at Clemson University, an in-depth educational experience in which "[s]tudents take on problems that spring from their own curiosity, from a professor's challenge or from the pressing needs of the world around them. Team-based investigations are led by a faculty mentor and typically span two to four semesters. Students take ownership of their projects and take the risks necessary to solve problems and get answers."[3] Realizing it would be impossible to walk students through that many databases in a traditional point-and-click session and that such a format would be minimally engaging anyway, we turned to the ACRL Framework concepts to help us create an interactive, foundational experience for both the students and the professor.

ACRL's Framework for Information Literacy for Higher Education encourages librarians to re-evaluate how they teach in the classroom and concentrate on building foundational skills rather than just teaching to specific tools. Creating student learning outcomes (SLOs) based on these threshold concepts allows librarians to focus on broad ideas about searching and help students understand the reason that databases are structured in certain ways, allowing them to transfer skills from one tool to the next. The threshold concepts help librarians "progress beyond teaching students how to use the library and address some of the more complex themes of information literacy."[4] There is evidence that many students do not understand the scope of the online search tools they use. For example, in a 2012 survey of middle and high school teachers, 47% rated students from fair to poor when asked if their students understood how online search results are generated.[5] Therefore, students may be entering college missing some of the foundational skills in

information literacy, a serious deficiency given the more sophisticated sources that post-secondary teachers, and the faculty member we worked with in particular, expect them to be able to locate and use.

After receiving the request to help the Creative Inquiry students find information about Samuel Aleckson and his narrative about life under slavery in Charleston, South Carolina, our first task was to identify frames and SLOs that needed to be addressed. Knowing that the request included coverage of more than 15 databases as well as a discussion about how keyword[s] "like 'negro,' 'afro American,' 'African American,' [and] 'colored' need to be thoughtfully employed in searches,"[6] not to mention showing students how to use library services such as interlibrary loan, it was apparent that clear outcomes were needed. For the initial session, the following SLO was chosen based on the "Searching as Strategic Exploration" frame: "Students will be able to distinguish between general and specialized article collections (databases) in order to select the most appropriate collection and to maximize the relevancy of search results." The idea behind this was to help students understand what was in each of the databases and how they might differ from one another. It is important for students to understand the difference between a search engine like Google and a database like Academic Search Complete—and most do not. In a 2012 Pew Report on how teens do research in the digital world, 94% of teachers surveyed said students were "very likely" to use Google versus the 17% who were using databases such as EBSCO and JSTOR.[7] By presenting multiple options, the librarians hoped the students would have more "buckets" to explore to find information on their topic.

For the second session, the following SLO was used based on the same frame of "Searching as Strategic Exploration": "Students will be able to revise search strategies based on their original results to locate the most relevant information." In the aforementioned 2013 Pew Report, the same teachers rated their students poorly when it came to their level of patience and determination when looking for information.[8] This could mean that if students do not find what they are looking for easily, they may give up. We hoped that in the second session, the Creative Inquiry students would re-visit their assigned databases and discover new search features and methods.

The ultimate goal for both sessions was to create a resource for the students to refer back to as they completed their project, so we decided to use the SpringShare LibGuides platform to create a shell students could help complete during the session. In order to ensure the students were all starting from the same place, we first asked for some very basic definitions that were then expanded into a larger discussion about research and databases. This exercise encouraged students to engage in deeper thinking than they had anticipated; many students initially thought they had the answer, but as they thought more about it, the definitions became more complex. For example, when asked "What is research?" many students answered that it was "searching for information." But when asked to expound upon their answers, they conceded that it also meant asking and formulating questions both about the topic as well as any sources that were discovered. When asked to define databases, several students were unable to articulate a clear definition beyond "a collection of information." One way to help students understand what a database can be is to tell them that if they have a cell phone, then they have created their own database by compiling names and numbers of friends and family.

After this introduction, which took about 10 minutes, we moved into the activities. Our outline looked like this:

- Activity 1 (10 minutes)
  - Hand out grid for primary and secondary sources and ask students to list what they define as primary and secondary in 5 minutes
  - Create lists as students offer feedback
  - Take up lists and post in online guide
- Activity 2 (30 minutes)
  - Give each student a database
  - Give students 10 minutes and have them look at their databases in their pairs and list the kinds of information available in each database
  - Ask students to present a 1 minute summary of their findings on each database
  - Take up lists and compile for online research guide
- Activity 3 (10 minutes)
  - Divide class into two teams
  - Using *Documents of the American South* and *Ancestry*, two databases crucial to their research, ask students to evaluate for pros and cons in 5 minutes
  - Report back

- Show interlibrary loan video (2 min)

The session went very smoothly, especially with two librarians facilitating; one would lead the discussion and the other would update the LibGuide in real time. Students were very keen to dive into their databases and made excellent observations about the content and structure of their assigned resource. The students all seemed very engaged and even though the faculty member seemed initially apprehensive about the teaching approach, by the end of the class, she was walking around observing and encouraging student interaction with the various databases.

At the conclusion of the session, the librarians assessed the students' progress by asking them to respond to the following questions on a piece of paper:

1. Make a list of the most important, useful, or meaningful points from this session.
2. In one sentence summarize the essence of these points.
3. List one or two questions that remained unanswered in this session.
4. Write a comment about what you enjoyed or found useful about this session.
5. Comment on how this session will help you in this class.

As a result of this feedback, we found students still had questions about citations, but that they found the format of the class to be very helpful. One student stated that "we walked through it and were involved, much easier to learn this way..." and another said that "I am much more comfortable navigating these databases now!" We could tell that students were more aware of other places to look for information; one student commented on "how easily searchable the various databases are if you know what you're looking for." Using this feedback, we built in extra time to cover citations and decided to continue with the same format for the next session.

The same LibGuide was used for the second session, in which students were asked to learn more about the search features in each of their databases. The session followed this outline:

- Introduction—recap of last session and review of lists and tables created in last session and provide a general introduction to keywords
- Activity 1 (10 minutes)
  - Use the group to brainstorm key words for their topics
- Activity 2 (20 minutes)
  - Give students the same databases that they examined in the first session and tell them they have 10 minutes
  - Ask them to find the "help" screens or the advanced search pages for their databases
  - Make a list of 3 search hints and tips for each database
  - Report back to class
- Activity 3 (25 minutes)
  - Divide class in half and tell them they have 15 minutes
    - Team 1: Use some of the search strategies learned to find some good online map resources using Google and Google Scholar
    - Team 2: Use search strategies to find map resources from the library webpage
  - Report back
- Show "How the Library Can Help You" video (2 min)

As in the first session, students were engaged with this process and took ownership of their individual databases. They took care to find ways to search their particular resource and did an excellent job sharing details with the class.

At the end of the second session, each student was asked to list the two search strategies they thought would help them the most in their assignments for the course. In asking this question, we hoped to ascertain the level of information the students were able to attain from the session based on our designated SLO. Examples of student responses on this assessment included:

- "You can use the 'fuzzy' option in advanced research on two of our databases to account for spelling variations."
- "I did not know that you could use an asterisk or question mark to find variations in words. Those tools will be incredibly useful in narrowing down and finding sources."
- "Using tagged subjects in a source to find other sources"
- "Search to see if a search engine categorizes search results"

As a result of both of these sessions, students indicated that they were more familiar with both the databases available and search strategies that they could use to find information.

Throwing students into the deep end of research or putting them into the databases without much instruction on how to use the interface seemed to be an effective teaching strategy, as was limiting the number of learning outcomes for each session. Situating some threshold concepts within a specific context enhanced student learning by providing a clear need for information literacy skills.[9] The students responded positively to learning independently and sharing their findings with peers. They enjoyed being involved by creating the LibGuide and looking at the databases with a mind to sharing what they learned with the class. Coupling the SLOs with student feedback made it easy to determine if the learning outcomes had been met, and it turns out that out of 10 students, only one said they still had a question about databases or searching.

Another chance to apply SLOs to the framework in order to structure a subject-related class arose from the request of a geography professor in the spring of 2016. The professor wanted 130 students in an introductory geography course to be able to find a reliable news source originating from a country each student had been assigned to research. The two learning outcomes and corresponding frames that were chosen were:

1. Students will be able to recognize indicators of authority in order to determine the credibility of sources (Authority is Constructed and Contextual)
2. Students will be able to identify multiple resources when gathering information in order to create a more complete and well balanced profile for their country (Searching as Strategic Exploration)

In order to meet these SLOs, the class was split in half: one half was asked to use Google to search for the news source, while the other half was asked to use library-subscribed news databases. Students were then asked to identify any bias in the news source, the criteria they used to determine if the source was reliable, and to provide one pro and one con to using the search tool(s) they were assigned. While this was a very large section, students were responsive when asked to discuss their experiences in both Google and the library databases. Once again, throwing them into the information and then asking them to discuss what they were (or were not) able to find allowed them to approach searching more mindfully. To determine if the SLOs were met, students were asked:

1. Will what we just talked about help you better understand how to evaluate news sources in the future?
   a. 93 students indicated yes
   b. 22 students indicated no
   c. 4 students indicated they were not sure
4. Will what we just talked about help you find more options for finding information?
   a. 100 Students indicated yes
   b. 16 students indicated no
   c. 3 students indicated they were not sure

In pairing student learning outcomes based on the ACRL Framework with assessment instruments, we sought to show the positive relationship between library instruction and student success in particular classes. We hope that by sharing these specific examples, other librarians may be able to create SLOs and assessments for subject-related sessions that are requested by teaching faculty. For future sessions, Clemson librarians will work toward creating an assessment that produces more quantifiable data. For example, a rubric may be developed or more defined assessment questions will be created. We might also do a skill-based assessment by asking them to do a search based on what they learned and then evaluate results based on a rubric created to fit the assignment. Whatever the specific strategies, this kind of threshold concept teaching will definitely continue to develop student-led activities and move toward active learning in our library instruction at the Clemson Libraries.

Notes

1. For context, Clemson University is a public institution in South Carolina with a student population of approximately 22,000. The library currently has 12 teaching librarians who each have areas of specialty and work with departments on and off campus as subject research librarians.

2. "Lowcountry Digital History Initiative," Lowcountry Digital Library at the College of Charleston, accessed 29 September 2016, http://ldhi.library.cofc.edu.

3. "Creative Inquiry and Undergraduate Research," Clemson University, accessed 29 September 2016, http://www.clemson.edu/academics/programs/creative-inquiry.

4. Lori Townsend, Korey Brunetti, and Amy R. Hofer, "Threshold Concepts and Information Literacy," Portal: Libraries and the Academy 11, no. 3 (2011): 857.

5. Kristen Purcell et al., "How Teachers Are Using Technology at Home and in Their Classrooms," Pew Research Center's Internet and American Life Project, February 28, 2013, accessed 29 September 2016, http://www.pewinternet.org/files/old-media//Files/Reports/2013 /PIP_TeachersandTechnologywithmethodology_PDF.pdf.

6. Susanna Ashton, e-mail message to authors, December 8, 2015.

7. Kristen Purcell et al., "How Teens Do Research in the Digital World," Pew Research Center's Internet and American Life Project, November 1, 2012, accessed 29 September 2016, http://www.pewinternet.org /2012/11/01/how-teens-do-research-in-the-digital-world.

8. Purcell et al., "How Teens Do Research."

9. Rebecca Z. Kuglitsch, "Teaching for Transfer: Reconciling the Framework with Disciplinary Information Literacy," Portal: Libraries and the Academy 15, no. 3 (2015): 458.

Implementing ACRL's Assessment in Action Program at UNCG Libraries to Meet the Information Literacy Needs of Incoming Transfer Students

Karen Stanley Grigg, Lea Leininger, and Jenny Dale
University of North Carolina at Greensboro, USA

Abstract

In the fall of 2014, a team of librarians at University of North Carolina at Greensboro (UNCG) Libraries surveyed incoming transfer students to determine their information literacy skills and needs. Based on demographic questions as well as questions designed to gauge information literacy skills, initial results indicated that older transfer students and students transferring from community colleges were least knowledgeable about basic information literacy concepts, and that students from all educational backgrounds who had attended library instruction sessions were more knowledgeable. Based on the results of this study, members of the UNCG Transfer Student Research Project submitted a proposal for further research on incoming transfer students to the Association of College and Research Libraries (ACRL)'s Assessment in Action: Academic Libraries and Student Success program. The team for this project included stakeholders from the libraries and other campus units. Two research studies were implemented in order to study the research skills and needs of incoming transfer students: a pre-test, intervention, and post-test assessment in a course designed for transfer and adult students and a follow-up survey of second year transfer students that assessed information literacy skills. The follow-up study compares students who had librarian interventions during their first year at UNCG with those who did not, and also compares the skills of students from a variety of transfer institutions, majors, age ranges, and time lapse between educational experiences. In the two Assessment in Action studies, there were fewer significant links between library instruction and information literacy skills, but both studies indicated a significant gain in comfort with library research and with contacting subject librarians for consultations.

Introduction and Literature Review

We began our study of transfer students and their information literacy skills and needs in fall 2014. According to the National Center for Education statistics, almost 1.5 million college students were "transfer-in" students (IPEDS) that semester.[1] Though this was actually a lower number of transfer students compared to prior years, these students still represented 7% of the more than 20 million students enrolled in higher education institutions that fall (IPEDS).[2] We became interested in researching transfer students because we saw a gap in the library literature—there has been quite a bit of scholarship on information literacy and first-year college students, but much less focused on transfer students.

Research on transfer students is much more prevalent in the broader educational literature. Particular attention has been paid to those who transfer into four-year colleges and university from community or junior colleges. In 1965, John Hills introduced the concept of "transfer shock" to the educational community. After examining a large number of existing studies and data sets focused on the academic performance of community college students transferring to four-year institutions, Hillse noted a "severe drop in performance upon transfer," which he called "transfer shock."[3] "Transfer shock" has been a consistent theme in the literature on transfer student transition, with many subsequent studies confirming decreased academic success after transferring, usually indicated by a lower grade point average (GPA). Scholars in recent decades have argued for a more holistic view of transfer student adjustment, taking into account more than just changes to GPA. Laanan, for instance, developed the Laanan-Transfer Students' Questionnaire (L-TSQ©), a 304-item survey meant to capture "(1) social demographics; (2) community college experiences; and (3) university experiences" of transfer students.[4] Using a modified version of this questionnaire with a sample of over 900 transfer students, Laanan, Starobin, and Eggleston noted the positive influence that learning and study skills developed at a community college (which they call Transfer Student Capital) had on the students' academic transfer adjustment. Some of the skills found to be significant

include: "note taking skills," "problem solving skills," and "time management skills."[5] While this study, like many of its kind, did not deal with library skills, we argue that library skills acquired and developed in a community college setting have a similar influence on information literacy skills upon transfer. Knowing what experience students gained with libraries, information literacy, and research skills prior to transfer can help librarians at four-year institutions predict these students' needs.

In the library science literature, a few studies of transfer students and their information needs or information literacy skills have been attempted. When Tag surveyed incoming transfer students at Western Washington University, "74.0 percent of the respondents have prepared bibliographies for research papers and 90.6 percent have received instruction on plagiarism."[6] Even with this experience under their belts, 68% of students still indicated that they wanted additional library/research instruction.[7] Tag speaks to the diversity of transfer student populations, a universal issue that can "create practical challenges" for resources and programming: "The group is diverse in age and educational experience, with subgroups of international students, traditional-aged community college students, first-generation, and older adult reentry students."[8] Tag and her colleagues made several attempts to develop content and programming for transfer students based on survey results, including increased integration with other units on campus serving transfer student populations and the addition of a transfer student-specific page on the library website.[9] She also writes that "the library used the survey data results to support the design of a comprehensive, discipline-specific library instruction plan for upper division and graduate students."[10]

In a survey of academic librarians in Ohio, Phillips and Atwood found that respondents typically did not provide any specific information literacy or library programming for transfer students, and only 13% of these librarians felt that transfer students needed specific programming at all.[11] While the studies were conducted with different populations and in different locations, the fact that librarians in Phillips and Atwood's study largely did not think that transfer students needed specific information literacy training, and students in Tag's generally did, made us curious about our own students. We were not providing much in the way of transfer-specific instruction, and we wanted to know if our incoming transfer students needed or wanted such programming.

Previous Study of Incoming Transfer Students

In the summer of 2014, the research team retrieved a list of all currently registered incoming transfer students and their e-mail addresses, and created a survey instrument in Google Forms that asked questions about basic demographics, such as incoming grade level, type of institution from which they transferred, previous exposure to scholarly research and research instruction, and age range. Additionally, respondents were given a set of questions to test their knowledge of basic information literacy skills: identifying keywords to use in a journal article database for a given topic, evaluating web sites for credibility, and demonstrating knowledge of proper citation. The research team created rubrics to evaluate two of the questions, and one question was simply coded as correct or incorrect. A graduate student statistician processed and analyzed these results in the form of a spreadsheet. Of the 1,068 survey solicitation recipients, 155 incoming students responded.

Some of the relevant findings were: the oldest students surveyed scored the lowest on the information literacy questions, as did the students from community colleges. In general, about 73% of all transfer students who responded scored either fair or poor in terms of knowing appropriate use of search terms, and 21.6% of all students reported never having had library instruction. Only 6.1% of those who scored "knowledgeable" had never had library instruction, while 54.5% of those who scored "poor" had never had library instruction. Interestingly, as age increased, the likelihood of having had library instruction decreased, which most likely reflects greater emphasis on instruction and information literacy over time.

Though the survey responses yielded several relevant and interesting findings, there were unexpected challenges in the methodology that suggested further study was needed. The team discovered, while creating rubrics, that one question's wording did not elicit the exact responses intended. The question asking about keywords to use in a search did not explicitly ask for the specific terms one would type into a search box, so the team felt giving extra weight to responses that used Boolean logic might exclude those respondents who

are familiar with Boolean logic but did not interpret that the question wanted the actual search strategy.

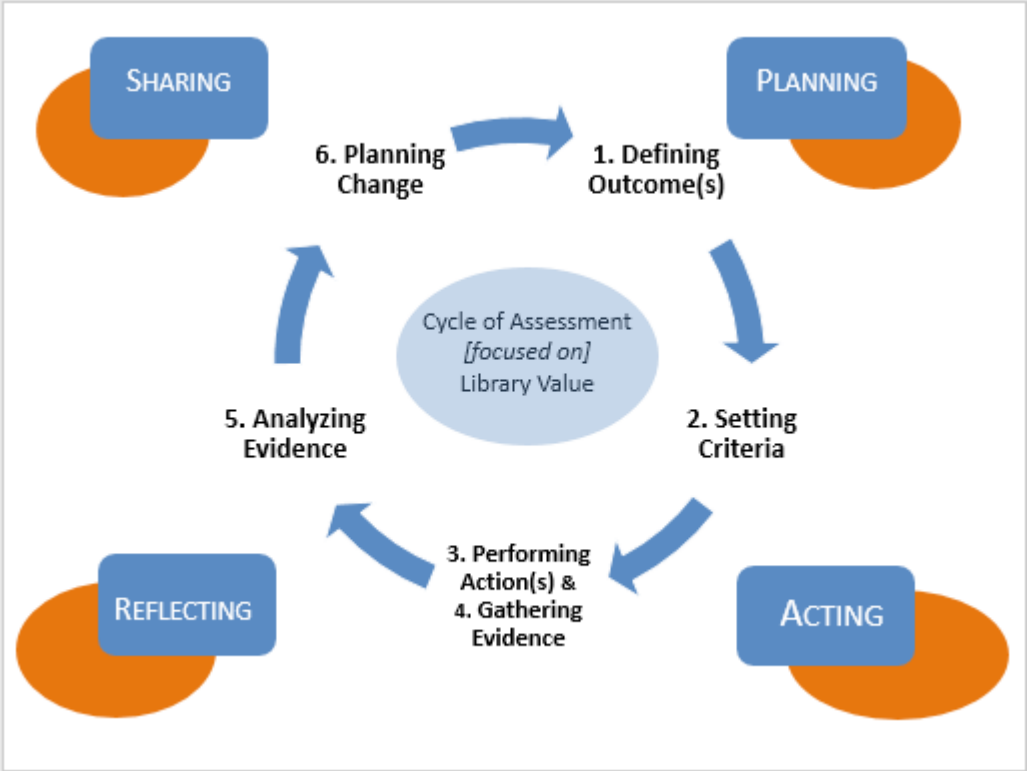
Given the relevant information gained in this research study, and given the fact that the team still had questions, the team decided to apply for and enter this project into the American College and Research Libraries (ACRL) Assessment in Action (AiA) program for the 2015–2016 year cycle.

Assessment in Action

In September of 2012, ACRL was awarded close to $250,000 for a three–year project called "Assessment in Action: Academic Libraries and Student Success." There were multiple planning grant partners, including the Association for Institutional Research, the Institute of Museum and Library Services, and the Association of Public and Land-Grant Universities. The purpose of this program was to build professional competencies of librarians in order to allow them to communicate the value of academic libraries, to build collaborative relationships across campus, and to contribute to higher education assessment work. Each participating institution had to produce letters of support, and teams consisted of a librarian team leader and other team members, some of whom had to be campus partners outside of the library.

The team leader agreed to lead regular team meetings on campus, represent the team at in-person AiA events, engage in online discussion forums, participate with a cohort and provide feedback, and to present a poster at the end of the program at the American Library Association conference. AiA used a model of assessment to organize projects that consisted of defining outcomes, setting criteria, performing actions and gathering evidence, analyzing evidence, and planning change.

Figure 1: "Assessment Cycle." *Assessment in Action Notebook*. **Chicago: American College and Research Libraries, 2015.**



Through in-person meetings with other AiA participants, advice from the cohort, and from other team members, the AiA team at UNCG decided to employ two different assessment instruments.

Study One: Pre- and Post-Test, FFL 250

Methodology

Two of the team members had been invited to provide library instruction to two sections of FFL 250: Enhancing the Transfer and Adult Experience

at UNCG. This is an optional course targeted to transfer students and adult learners, and is designed to assist these learners in developing competencies essential for academic success. The team designed a pre-test in Google Forms, asking students to demonstrate whether they could find books in the library, choose which of two articles was scholarly, and explain why. The form also asks class participants to describe their comfort level with finding books in the library, discerning between popular and scholarly articles, figuring out where to go to find needed information, and using proper citation. The original intention was that students would complete the pre-test outside of class before the library instruction session.

The instruction was planned to fit into a 40-minute time period, with hands-on exercises in all the areas covered by the pre-test, followed by a ten minute post-test containing similar tasks to perform as in the pre-test, along with similar questions about comfort levels with these tasks. The results would then be imported into Excel and analyzed using SPSS.

Results and Discussion

Though some interesting results emerged, this study also faced some limitations and challenges. The pre-test links were not delivered to students prior to the class, as intended. Thus, the instruction librarians had to re-allocate time to allow for both the pre-test and the post-test within the 50-minute session. The addition of the pre-test not only rushed students through the session, but the immediate deployment of the post-test could be said to only measure how well students remembered what they were just told. Another challenge was that one of the two sections contained students who appeared to be facing learning or technology challenges. These students, some of whom had helpers, were largely unable to complete the pre- or the post-test. Therefore, the team discarded results from this section and relied on the results from the second section only.

Librarians on the team created a rubric to evaluate answers to these three questions, and each tested the rubric and revised. A pair of student statisticians was assigned to the two projects. For this assessment, there were paired sample tests on all data and t-tests on selected data. Attitudinal questions were graded on a three point Likert scale of “not comfortable,” “somewhat comfortable,” and “very comfortable.” Due to the loss of one section of the class, there were some questions where some correlation was observed, but the small sample size could not be deemed statistically significant. The student statisticians advised that, were this study repeated, a larger bank of questions and a larger sample size could improve results greatly.

The results did indicate that there was some improvement in performance between pre- and post-tests, but the improvement was not statistically significant, due to the sample size. What was statistically significant, however, was an increase in comfort levels regarding common research tasks. Students indicated a 25% increase in comfort for finding journal articles, a 26% increase in comfort for finding books, and, though several students indicated they were not comfortable with finding books and journals in the pre-test, zero indicated the same in the post-test.

Figure 2: Comfort level finding journals in the library, pre- and post-tests

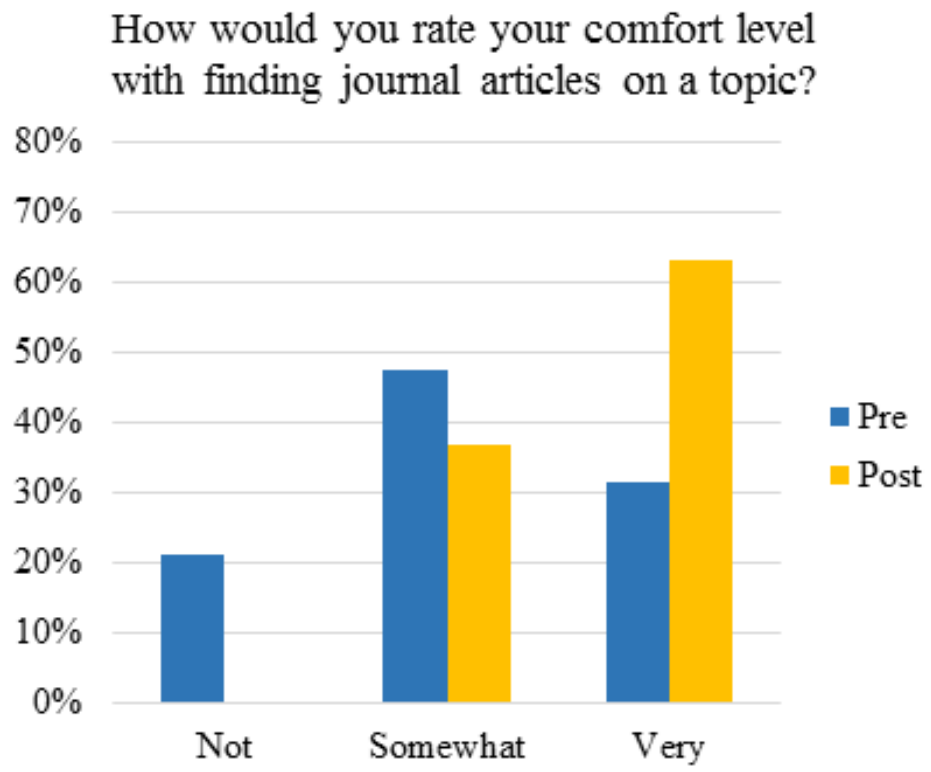
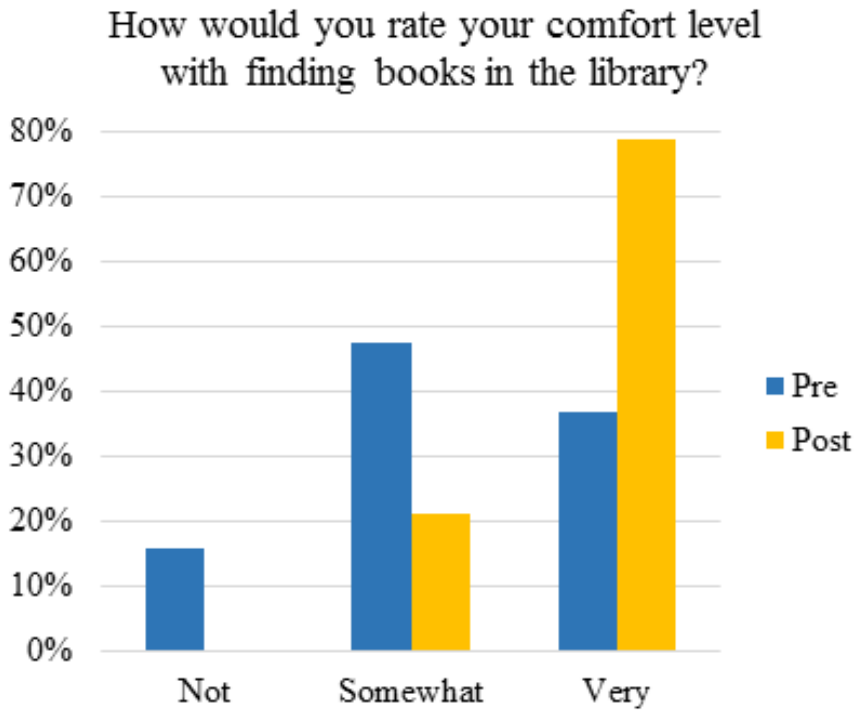
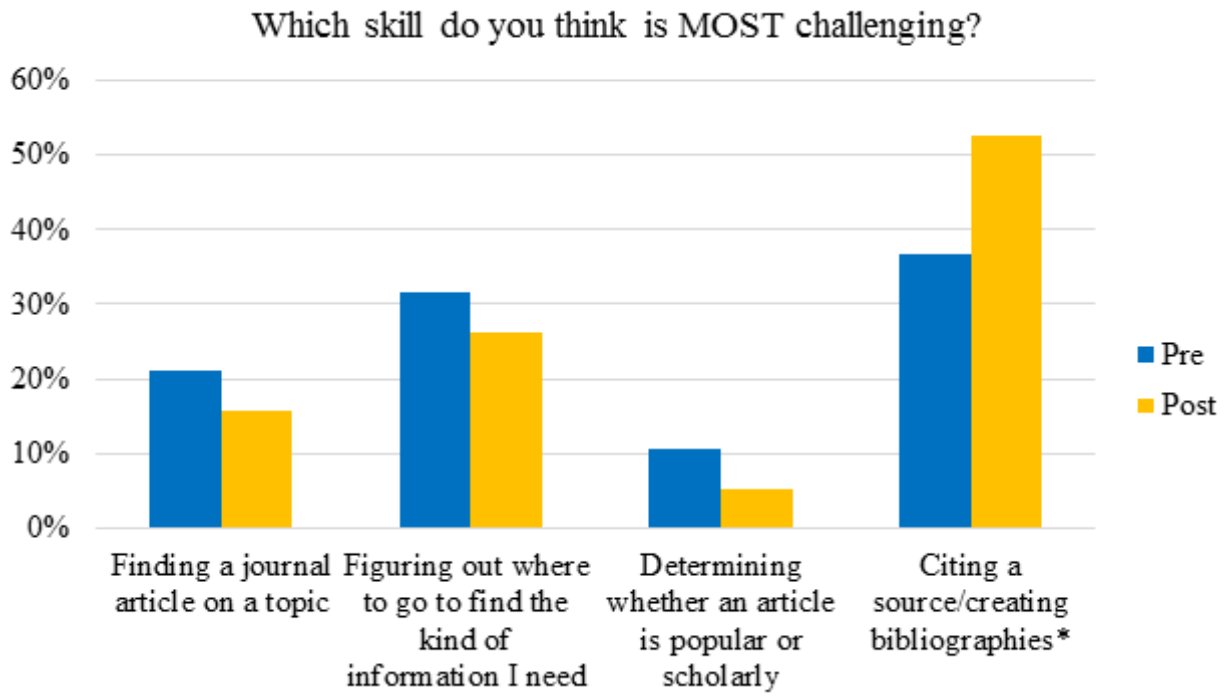


Figure 3: Comfort level finding books in the library, pre- and post-tests



Other useful information included learning what skills students found the most challenging. Proper citation was considered the most challenging skill in both the pre-test and the post-test. The second most challenging skill was figuring out where to go to get needed information, and the third was finding journal articles on topics. The form allowed for write-in responses, and several students indicated that an in-person library tour would be helpful.

Figure 4: Most challenging skills identified in pre- and post-tests



** The question on citing sources and creating bibliographies was inadvertently worded slightly differently in the post-test than it was in the pre-test, which can be seen in the links below. However, both questions showed citation as the perceived most challenging skill.*

The team, along with the statisticians, believes that it would be useful to try a similar study, but with a larger group of incoming transfer students. One of the team members was the director of the New Student Transitions and First Year Experience department, so the team is working to identify better opportunities to test these measures on a larger group of transfer students.

Study Two: Re-surveying Previous Year's Incoming Transfer Students

Team members designed the second study to follow up with the cohort of 2014–2015 incoming transfer students after one year of study at UNCG. Some of the same demographic questions were asked, with a few additional ones to address previously identified gaps. However, because the intent was to test identical responses one year later and compare, the team did not make significant changes. Again, these students were asked to complete a few questions to determine their information literacy skills. In this follow-up survey, students were also asked what types of interactions they had experienced with librarians, including visiting the reference desk, using chat, having a librarian provide instruction in one of their classes, and having a consultation with their subject librarian. The question asking respondents to indicate their search strategy was rewritten to more precisely ask students what exact words they might type in the search box, in order to give extra credit to attempts to use connectors such as "and" or "or." The citation question was rewritten in order to indicate that students should only select

statements that required citations. The team used the same e-mail list used in the first study.

One unexpected result of note came when almost half of the e-mails sent out bounced back because the e-mail account no longer existed. Because it is not very often that a transfer student enters and graduates within a year, it is assumed that most of these e-mails bounced because the student had dropped out or transferred again somewhere else. The team could not extrapolate as to why so many students had left UNCG, but it speaks to retention challenges.

Because of these e-mail bounces, it was no surprise that the number of respondents had dropped, this time to only 58. The smaller sample size made it more challenging to find differences between groups.

Results and Discussion

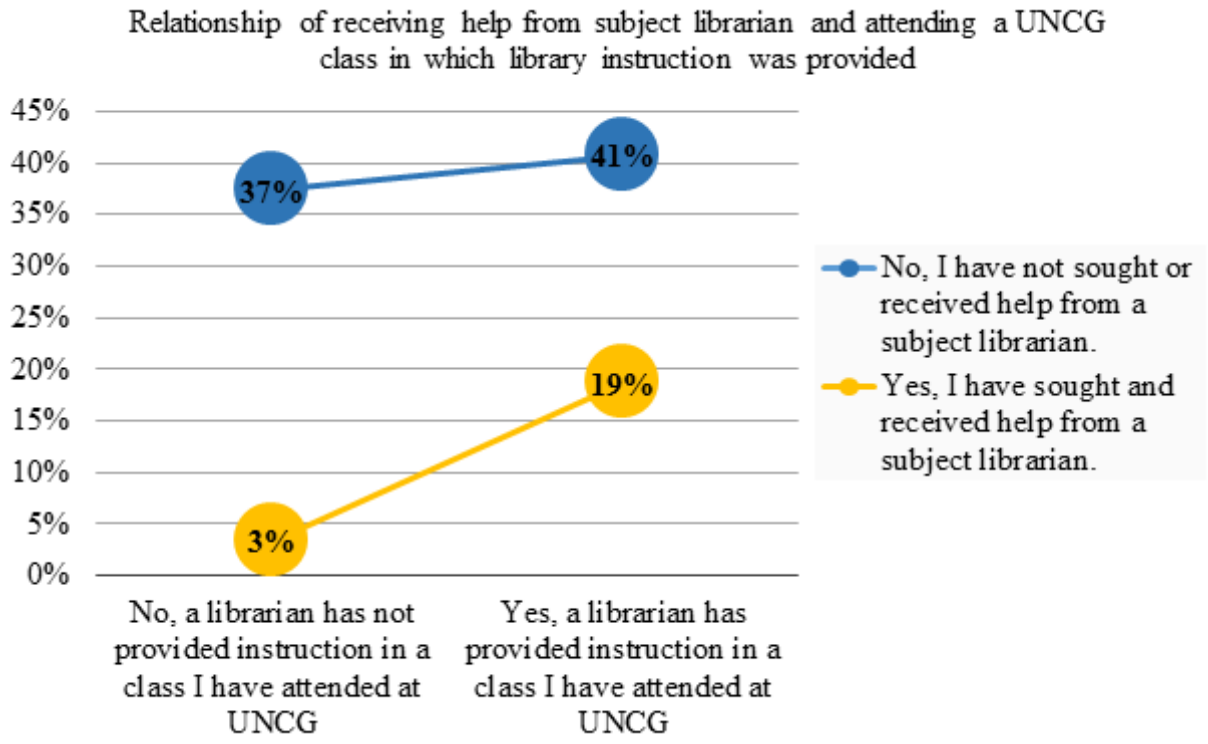
The statistician used a four-point scale with averages, which differed from the statistician from the previous study, who used "knowledgeable," "fair," and "poor." Also, the questions were slightly different, so direct comparisons between scores in the 2014 study and the 2015 study are not meaningful, but it is interesting to note that, in the initial study, about 73% of respondents scored as either fair or poor, leaving only 27% as knowledgeable. In this study, the search average score was 60% on a four-point scale.

One question asked in the more recent study was how long the respondent's education gap had been. In the initial study, results showed that older students scored more poorly than younger students, but, since no question asked how many years it had been since the respondent had attended another institution, it was unclear whether the correlation was between age and knowledgeability, or length of gap and knowledgeability. As expected, older students were more likely to have a gap in their education than younger students, thus suggesting perhaps the gap was responsible for the lack of information literacy skills.

In the initial study, significant differences were found in knowledgeability based on age, transferring institution type, and previous exposure to library instruction. In the 2015 study, there were no significant differences found by any demographic factors. There are several factors that might explain the lack of significant differences. First, the sample size was much smaller, and a larger set of results tends to tease out more correlations and significant differences. Second, the percentage of students who scored poorly in basic information literacy skills was higher in the first study, and it is possible that some of the lowest scorers are no longer attending classes at UNCG, or that a year of study at UNCG improved scores overall.

One year later, 59.3% of respondents reported that a librarian delivered an instruction session in one of their classes over the previous year. The most significant finding was that students who had received library instruction had sought and received consultations from subject librarians more often than what would be expected if there were no relationship. From the bar plot, we can see that, of those that did receive instruction, a greater proportion received help from a subject librarian (as compared to those who did not receive library instruction). There is a statistically significant correlation at the level that indicates the datapoint of 19% for "yes & yes" is higher than expected. Therefore, this is evidence of a relationship between a student attending a UNCG class in which library instruction was provided and receiving help from a subject librarian.

Figure 5: Correlation between students who have had library instruction and have sought help from a subject librarian



Both Assessment in Action studies pointed to improvements in confidence and in comfort seeking help from a reference librarian after receiving library instruction. Though the differences in performance were not statistically different, increased comfort with library research tasks and seeking help from subject librarians would likely lead to increased skills over time. Psychologist Albert Bandura has written extensively about his theory of self-efficacy, and posits that greater levels of confidence lead to increased self-efficacy, which eventually leads to higher cognitive function: "People with high efficacy approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters interest and deep engrossment in activities."[12]

The Assessment in Action program benefitted the research team in several ways. First, the program structure forces librarian researchers to look outside the library to find natural partners in the larger organization. Second, the program provided a cohesive model of the Cycle of Assessment, which allowed for participants to think carefully about outcomes, methods, and measures in a structured manner. Third, the program provided an opportunity for participants to work closely with a cohort that could provide feedback and direction.

Next Steps

While the initial study garnered a sufficient response rate to find significant results, the two studies in the Assessment in Action program suffered from a smaller number of data points. The team would like to try a similar survey study with incoming and returning transfer students, but perhaps using pre-existing data that does not rely on self-reporting. Survey fatigue can decrease response rates. Some data can be pulled from library instruction statistics and registration data, determining how many attendees of a class are transfer students. Additionally, if librarians can find an entrance to transfer student orientations, it might allow for greater response. The library has now employed a part-time statistician, who was one of the two students who analyzed the data from the AiA studies, and the team now has the advantage of working closely with someone who can better advise the group on best practices in both quantitative and qualitative future studies.

The team is also investigating using other assessment measures. This year, several UNCG librarians will bring in transfer students to participate in focus groups, which we hope will allow for greater insights on the research needs and backgrounds of incoming and current transfer students. Additionally, the team is contacting librarians from feeder area community colleges to discuss collaboration on handoff instruction and outreach.

The team leader and the libraries' diversity coordinator was asked to participate on a Howard Hughes Medical Institute (HHMI) grant proposal to develop services, instruction, and outreach to aid in student retention and success for transfer students in STEM majors, particularly with underrepresented minorities, and librarian embeddedness is included in the grant plan. This participation will allow the libraries a strategic partnership across campus in outreach to our transfer student population and marketing our services and resources to a population that is challenging to target.

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Score! Using Competitive Assessment Approaches to Chart Growth in Critical Thinking and Information Literacy with Incoming First-Year Student Athletes

Colleen Mullally
North Andover Public Schools, USA

John Watson
Pepperdine University, USA

Abstract

The aim of this pilot study was to improve first-year student athletes' knowledge and skills relative to critical inquiry and information literacy. NCAA Division I scholarship students were randomly selected to participate in an independent section of a two-unit, semester-long life skills course required of freshman athletes. A planned curriculum and strategically designed summative and formative assessments formed the foundation of a class that was to serve as an information literacy program evaluation for this unique population. Measuring degrees of progress happened by use of various assessment practices of each individual class session and with a pre- and posttest using the SAILS individual survey.[1]The SAILS survey results found a significant improvement of the experimental group's information literacy skills. However, the most significant assessment was found during the review of each class session. Information gained allowed for adjustments in future classes and reinforcement of concepts and tools that had not been fully captured by the students.

The pilot study provided valuable outcomes to adjust the course curriculum to be more effective in providing the information and training to significantly improve first-year student athletes to be more comfortable and effective in critical inquiry and have the knowledge and skills to seek information to answer questions. Ultimately, it is hoped a formal study will determine if the course objectives impact the student athletes' academic performance.

Introduction

Studies have identified several factors interfering with an NCAA Division I student athlete's full investment in the academic process. These include mental and physical fatigue, time management, missed class time, and the number of hours required to participate in the sport. This study is focused on ways to improve NCAA Division I student athlete academic success. One element explored is the value associated with better critical thinking and information literacy skills, including the services of professional librarians.

This pilot study was conducted during the fall 2015 semester at Pepperdine University, a premier non-football NCAA Division I member institution. During their first semester, all new student athletes are required to enroll in a two-unit life skills course, which is graded credit/no-credit. Of the 93 first-year student athletes, 21 scholarship athletes were randomly selected to participate in the study. Limiting the experimental group to scholarship athletes is based on the assumption that they selected Pepperdine University primarily to participate in their sport, and was not based on academic priorities.

A librarian and a tenured member of the faculty partnered to co-teach the experimental section of the life skills course with an emphasis on development of critical inquiry and information seeking skills. The study explored the effect embedded information literacy instruction has upon a first-semester student athlete's grades, information seeking skills, and perceptions about research.

Literature Review

McBride and Reed argue that critical inquiry is a skill needing to be explicitly taught to student athletes.[2] Most research in this area focuses upon providing outreach services to specific teams within the athletics departments on campus to help this

population with their information literacy and critical thinking skills. Librarians Robinson and Mack at Penn State have published on techniques they used with the football team and have argued that sports teams are easily identifiable, often underserved by libraries, and are "a ready-made learning community."[3] These librarians were able to reach an entire sports team in a targeted information literacy pilot program in 2002, though their emphasis was in distance outreach via e-mail and instant messaging services.[4] Jesudason similarly detailed distance help provided to student athletes through e-mail.[5] Additionally, librarians at the University of Iowa provided the history and context for their targeted program of incoming student athletes.[6] Though limited in scope of evaluation, librarians at Valdosta State University highlight, among a number of outreach approaches for athletes, their work to improve library skills within the CHAMPS class.[7]Petrucelli's recently published dissertation concerning students athletes' perceptions of learning[8] and Jolly's findings of challenges that student athletes confront[9] will be useful as points in comparison upon reviewing the findings of this study.

Study Design

Formative Assessments

Nearly every class session contained at least one active learning activity with an assessable component in order to check for learning and inform the design of future lessons. With emphasis on building students' research inquiry and information literacy skills, these activities centered on locating, analyzing, synthesizing, and presenting information. The corresponding assessment artifacts included: traditional written responses such as worksheets and one-minute reflection papers, poll tallies for anonymous and immediate discussion, completed team cards from the library scavenger hunt, quiz scores from Kansas State University's New Literacies Alliance online modules,[10] and longer (in-depth) independent class assignments.

While a sequence for the lessons had been designed prior to the start of the semester, the researchers were flexible to adjust the process as a response to feedback from the completed classes. The results from activities appearing earlier in the semester helped to determine which concepts should be re-emphasized and what types of activities would be more successful in maintaining students' focus. Examining student performance on the individual and group writing assignments during the latter half of the semester provided a means for evaluating the cumulative effects of the classes during the semester and measuring progress in critical thinking and information literacy skills. Conscious efforts at collecting assessment data and reflecting on the weekly lessons helped the study leaders when drafting a document with recommended changes to improve the class for future students.

Summative Assessments

Summative assessments focused on measuring changes in the students' information literacy skills and their perceptions of research over time. By pre- and posttesting, the researchers were able to gather data on the impact of the semester of information-literacy-focused course work. This testing emphasized a student's level of confidence in finding information and the use of outside information sources. In addition, the Standardized Assessment of Information Literacy (SAILS) testing instrument assessed information literacy skills.[11]

Results

Overall Measure of Progress in Assessing Information Literacy Skills

The SAILS test administered in the opening week of the semester indicates the first-year student athletes in the study scored at the same level of information literacy proficiency as the benchmark data of traditional first-year students entering doctoral institutions in the United States (which includes non-athletes).

At the completion of the course, the study participants correctly answered 57% of the survey questions on the posttest. The average benchmark of correct answers for first-year students at doctoral institutions on this version of the survey is 42.8% (and 45.7% regardless of class standing).

The study participants improved their understanding of information literacy skills by 9.2% during the course of the semester. Individual score improvement ranged from -10.9% to 27.3%, with a median score of 10.9%.

Learning from the In-Class Assessments

The objectives for the in-class assessments were to (1) identify students' areas of strength and weakness throughout the semester; and (2) to learn by the outcomes of classroom exercises how to improve the class in future years.

Reflective Writing Can Provide Assessment Data

Collecting artifacts for assessment can provide useful evidence about student learning, but these artifacts do not always need to come from directly evaluating the student's work. The study leaders were not deterred from using certain activities even if they knew there would be little or nothing in the way of assessable artifacts. One of the most successful classes came early in the semester during a brainstorming session modeled after The Right Question Institute's Question Formulation Technique exercise.[12] During this session, students gained significant experience generating, revising, framing, and prioritizing questions alone and in small groups as they responded to the phrase "myth of the dumb jock." In addition, students learned about and produced mind maps of their questions. The success of this class was measured not by counting the number of questions generated or by quizzing students later on examples of closed- and open-ended questions; rather, their learning was evaluated based on what they wrote in their one-minute response papers. Reflective writing was quite revealing of the learning and value of the evening's activities. The students' comment cards revealed that they understood the foundations of the lesson. Responding to the cue of what was learned during class, one student wrote: *"Mind maps let your brain figure things out in a creative way."* Twenty students completed the activity and all wrote about some combination of aspects related to learning about organizing ideas, creating questions, and mind mapping. Nine responses were about organizing information/ideas/topics, and eight were about asking questions. Three of these eight students who wrote about learning how to ask questions also wrote about how to write better questions. Two students did not talk about learning to write questions but only about how to write better questions. Sixteen wrote about learning about mind maps in some shape, nine referenced the process of mind mapping, and five reflected on helpful aspects of mind mapping. Four students wrote about the class topic of the myth of the dumb jock. One wrote about the writing process and asking questions as well as using the online software mind mapping tool. Reflective writing was helpful for both assessment and in allowing students the time to think about and process what they had learned.

Baseline Assessments Help in Evaluating Initial Understanding

Early in-class assessments provided the researchers with a baseline for students. Initial activities were designed to test students' proficiency in basic online tools as well as their ability to generate broader, narrower, and related keywords. Their first in-class activity was not prefaced by any discussion of generating keywords. The handout provided a few tips on using Google Sheets and instructed them to populate a Google Sheets template with as many keywords and phrases as they could come up with that related to the evening's topic of time management. Visual observations of their attempts during class were enough to realize that students were unfamiliar with Google Sheets and would need additional instruction in using Google Apps for Education. Evaluating student responses based on completeness, unique words, variety of terms, and range of topics, the study leaders found that only half of the students were successful in creating a Google Sheet and that the students required more guidance and practice in generating keywords related to their topics. As a result, the librarian and faculty member modified the approach during the remaining classes by providing more time for technology setup, infusing sessions with additional low- (or no-) tech activities, and modeling/practicing the activities as a group.

Competitive Classroom Assessment Activities Motivate Students

The study leaders learned early in the semester that students were highly motivated when in a direct competition with one another. With the assistance of the special collections librarian, the class used materials from the Pepperdine University Archives to evaluate audience, purpose, relevance, and context for visual artifacts. Students began with this activity so that they could later begin applying this type of critical thinking to quickly scan large amounts of text for relevancy. Pitting groups against each other, each group was attempting to generate the longest list of unique properties about their archival document. Students worked together at a fast and focused pace to identify the most properties in the time allotted and were very enthusiastic in sharing their findings with the class at the conclusion of the activity. While this particular competitive activity was highly engaging to the students, the measure for success came through observation rather than by a rubric or other formal evaluation method.

Measuring Mid-Semester Progress is Important

The results from several early classroom activities related to students' early thinking about accessibility of information were helpful in planning for follow-up discussions and activities in the middle of the

semester. Using poll prompting, students reported their level of agreement with the statement "Google indexes everything on the web." Results showed that only one student disagreed with the statement. In another introductory class, the librarian and faculty member found that students were able to correctly identify freely available resources 80 percent of the time but could only distinguish content that came from behind a paywall 43 percent of the time. Using this information to identify areas of strength and weakness, the study leaders returned to the concept of freely available and paid content in later classes where students practiced generating keywords and searching for information in different web and library resources. Students were evaluated on their ability in several different activities to critically think about authorship, content, audience, purpose, and bias. In one annotated bibliography in-class activity, the librarian and faculty member found that all but one of the students was able to locate scholarly sources. Some struggled with finding contextually appropriate material and others continued to struggle in distinguishing articles from other scholarly materials like dissertations. A few students provided very thoughtful responses but many students did not provide enough information to show deep thinking about their choices.

Rubric Evaluations Provide Authentic Comparative Data for Culminating Assignments

An individual and a group assignment consumed much of class time during the culminating weeks of the semester. Students were provided with one of seven different research papers on topics related to the social, psychological, academic, and personal well-being of student athletes that had been written by first-year students the previous semester. They were instructed to read their assigned paper, prepare an outline of the major points addressed within the paper, locate and read three of the scholarly articles used in the paper, describe how they located the sources they selected, and then note what was learned from each article that was not covered in the paper. Students needed to submit their findings first individually in writing and then collectively during group presentations in the final class.

By using the same rubric to evaluate both the individual version and the group version of the completed assignment, the study leaders were able to determine the level of mastery reached by each individual and measure whether the collaboration from the group members improved the overall score. Students were given up to two points in five categories: takeaways of paper, highlights from articles selected, use of scholarly materials, criteria for identifying scholarly materials, location of scholarly materials, and the role of the library in research.

No individual papers received the highest score; however, one group did obtain twelve out of twelve possible points in their presentation. Closer evaluation of rubric scores for each category of the individual papers confirmed that one team collaborated well and learned from one another in order to fully satisfy all aspects of the assignment in the final presentation. A second group saw a four-point overall group improvement over the highest individual's score. Another group experienced a three-point overall improvement in their team presentation over the highest individual score. Unfortunately, such experience did not repeat itself in all groups. Two groups saw no improvement and the remaining two groups were awarded lower group points than the individual with the highest score in each group. It was difficult to know whether personality issues or other group dynamics were responsible for the end results, but the librarian and faculty member did learn that some groups had shown marked improvement when they reviewed the materials as a team.

Value of the Study

Despite the challenges of motivating this special population without a letter grade, it was possible to observe and document evidence of learning in the class through both formative and summative assessments and to use assessment to inform future classroom instruction. A mix of assessment techniques, assignments, and activities fostered a culture of purposeful teaching focused on continuously improving our learning environment for our students.

The assessment process involving individual class sessions was more revealing of learning progress than the survey data alone. This is primarily due to the observed involvement of individual participants in class. The surveys were administered on the first and last day of the 15-week course. It is important to reiterate that the participants were required to take the course but accountability was minimal given the credit/no credit grading process. The course has a long history and tradition of being a life skills class and introduction to university services with minimal academic rigor. Therefore, the students participating

in the study entered with low expectations relative to class involvement. Given this entering expectation and to retain the randomly selected participants, a commitment to no homework was given as long as the participants were fully engaged with each two-hour class objective. Most participants honored this commitment and were active participants in class discussions and projects. Based on the time invested in responding to the pretest and posttest surveys, 89% of students were engaged with the pretest survey whereas 72% invested the expected time on the posttest. For each of those not investing the necessary time in the posttest, there was an average 4% decline in score results on the SAILS survey. For those invested in the posttest, as measured by the time investment, scores increased by an average of 14.26%.

The project's posttest SAILS data had an average score of 57%, with the doctoral institutions' benchmark average score for first-year students being 42.8% on the posttest version of the survey. In addition, the participants' average score was also significantly higher than the overall (all undergraduate class levels represented) benchmark score of 45.7%. The average score of the participants in this study suggested a significant growth in the development of information literacy skills.

The posttest survey sought information relative to the student's first semester college experience. Not surprisingly, 65% of the participants found managing time the most difficult transitional challenge. Other challenging, but manageable, areas included learning course materials, getting help with schoolwork, and interacting with faculty.

The in-class assessments proved most helpful in understanding whether students were learning objectives of the class and determining the feasibility of the learning sequence for future years. Baseline assessment shaped the content of later lessons and the results from early activities provided assessment data relative to structuring future activities. The process confirmed students were able to put into practice the knowledge and skills presented.

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Dream of a Common Language: Developing a Shared Understanding of Information Literacy Concepts

Deborah A. Murphy
University of California, Santa Cruz, USA

Abstract

Librarians are an essential part of the diverse community of campus stakeholders focused on student success. Establishing a mutually understood and shared foundation of concepts is critical if we wish to collaborate successfully with these stakeholders on assessment projects and ultimately integrate information literacy into campus learning outcomes and student success goals. The process of developing and normalizing a collectively accepted understanding of information literacy between librarians, faculty, and institutional research partners was more of a challenge than anticipated and required research, discussion, documentation, and patience to achieve.

Background

In 2011, the University of California, Santa Cruz, embarked on an extensive campus-wide strategic plan that included a focus on undergraduate student success. In support of this effort, in 2013, the university library created an Undergraduate Experience Team (UET) of four senior librarians and a library assistant who would all be responsible for lower-division library instruction.

At the same time, the university library adopted an exclusively online instruction approach to support lower-division library instruction. Prior to this, Composition 2 and Writing Program courses comprised the vast majority of the library's in-person, one-shot library instruction sessions. Students in these courses are required to engage with popular and scholarly sources in order to complete a requisite research assignment. The library had supplemented these in-person instructional sessions with several self-paced online tutorials using the Guide on the Side (GOTS) interface from the University of Arizona Library.

Along with the mandate for an online only approach to lower-division library instruction, UET was charged to build an assessment-driven foundation for long-term student success and articulate a mutually understood framework of information literacy concepts in collaboration with other campus stakeholders committed to student success. Establishing a culture of assessment was key to creating a successful environment. Librarians who wish to connect and support student success need to be able to assess student work in a systematic manner in order to determine evidence of information literacy skills.[1]

UET chose to determine if the GOTS tutorials currently in use were effective in ensuring students acquired the needed information literacy proficiencies to complete their research projects when supported by an online tutorial in lieu of in-person information literacy instruction and, if not, what areas were not being addressed. This evaluation would provide UET with an opportunity to connect with writing faculty and lay the foundation for future assessment of instructional support resources.

The Project

In early 2015, UET partnered with Writing Program faculty and the Institutional Research, Assessment, and Policy Studies (IRAPS) department to develop and carry out a project to assess an existing online research tutorial in terms of its scope and effectiveness to teach the research skills lower-division students needed to satisfy Writing Program course learning outcomes. The project, "Evaluating Research Projects to Measure Information Literacy Outcomes for Lower-Division Writing Students," was accepted for participation in the "Assessment in Action: Academic Libraries and Student Success" (AiA) initiative sponsored by the Association of College and Research Libraries (ACRL) in partnership with the Association of Institutional Research and the Association of Public and Land-grant Universities.

Our writing faculty partners had a long history of incorporating library instruction into their teaching,

prior experience in developing and applying rubrics, and, along with our IRAPs partner, a commitment to effectively integrating information literacy standards in the context of Program Learning Outcomes (PLO) not only in the Writing Program but across the curriculum. The project timing coincided with a campus-wide re-envisioning of undergraduate learning outcomes, particularly information literacy.

In fall 2015, students from four sections of Writing 2 and one section of Core 80B participated in the project. They were asked to complete a library online "Academic Search Complete Tutorial" (ASC) used by Writing faculty for their students since 2014 and delivered via the GOTS interface. Of the 115 total students involved, 84 completed the tutorial and accompanying quiz questions. Students were then asked to complete a survey regarding their research process. In addition to these two sources of data, the project team received copies of each student's list of cited works for their required final research assignment. The project team developed analytic rubrics and applied them to each student's research process survey and assignment bibliography to measure students' information literacy proficiencies.

Challenge: Differing Perspectives

Creating learning outcomes and an appropriate analytic rubric involved challenges, the most critical of which was clearly articulating a shared understanding of what we were assessing. All project members agreed on the importance of information literacy within the research process; however, the way each of us viewed and interpreted information literacy itself varied greatly. These differences became obvious as we began discussions and found that librarians and writing faculty speak very differently when describing the research process: "[S]cholars approach research through their knowledge of the discipline, their understanding of theories or paradigms, and recognition of prominent names in the field."[2]

With our differing perspectives and terminology, it was often difficult to communicate effectively even though we held many basic concepts in common. Words and "terms are conflated or interchanged regularly in educational theory... Instructors and organizations used the terms as they wanted, as long as internally the hierarchy was evident and their use consistent..."[3] We had to find a way to articulate mutually held concepts as well as being able to identify where differences occurred before we could truly begin work. We needed a solid foundation in order to create clear, specific, and measurable assessment objectives.

Challenge: Changes to ACRL Information Literacy Concepts

Our group went forward with this project during a period of great transition in the landscape of information literacy. In 2000, the Association of College & Research Libraries (ACRL) published the groundbreaking work *Information Literacy Competency Standards for Higher Education,* an influential document that became the foundation for the advancement of information literacy into higher education. In use for the last fifteen years, these standards were embedded within library instruction, resources, and campus-wide collaborations in academic libraries across the United States.

In 2015, ACRL unveiled an entirely new "Framework for Information Literacy in Higher Education." More a theoretical document, this new framework lacked the standards or learning outcomes essential for assessment purposes and did not map to existing ACRL information literacy standards. It was instead "based on broad frames; focused on concepts rather than skills; comprised of threshold concepts, knowledge practices, and dispositions; and abbreviated in length."[4]

Though intentionally less precise to allow more freedom and flexibility in application, transforming these frames into usable learning outcomes was an additional challenge. Oakleaf noted that "[t]his level of freedom comes hand in hand with a level of ambiguity... and where there is ambiguity, there can also be a fair amount of difficulty..."[5] Though the new ACRL framework did not correspond exactly to the former ACRL standards, there were areas of alignment.[6] We began with the existing ACRL information literacy definition and standards and gradually introduced new framework components as we developed our learning outcomes. Our learning outcomes became a hybrid of both the older ACRL standards and the newer framework, hopefully allowing us to have a reference point when looking back at previous assessment data that used the older ACRL standards, as well as a beginning to incorporate the new framework for future assessments.

Mapping the Concepts

Our first step in developing our learning outcomes was to create an overview of the components informing this project and arrange them in correlation to each other. This document became our learning outcomes map (see Appendix A) and included major information literacy standards, Writing Program objectives, and library research skills covered in the tutorial, plus UCSC's newly developed outcomes for graduating seniors. Though not seen on this document, we also incorporated concepts from the Association of American Colleges & Universities (AAC&U) LEAP "Essential Learning Outcomes." Glaring omissions from this matrix were information literacy program learning outcomes for the Writing Program. As part of a campus initiative, departments were required to develop measurable information literacy learning outcomes and the Writing Program was not alone in having yet to create these. This project presented a wonderful opportunity for the library to collaborate with writing faculty and provide input on learning outcomes for information literacy.

It was clear that there were differences in our understandings of research and the ways we teach it to students. To resolve some of the confusion created by the variety of terminology used by faculty, librarians, and the new ACRL framework, we created a glossary (see Appendix B) of terms that clearly defined words and usage. Creation of this list was a time-consuming process that ultimately proved to be a key resource that we consulted frequently as we proceeded with the project. The glossary was the first step in correlating information literacy accreditation standards with potential learning outcomes for the UCSC Writing Program.

We divided our workload among the project team members. Librarians outlined the library skills covered in the tutorial being assessed and the characteristics that would be used to identify levels of mastery and used this to create a set of learning outcomes with evaluation criteria. With the help of our glossary, we then worked through comparisons of information literacy and Writing Program objectives to develop a matrix correlating information literacy standards with specific learning outcomes appropriate to the UCSC Writing Program (see Appendix C). This detailed matrix was used to articulate key learning outcomes in the ASC tutorial and informed our selection of specific rubrics based on those successfully used by other academic libraries for first-year student-learning outcomes. We further customized these rubrics for our ASC tutorial learning outcomes and the Writing 2 learning outcomes related to information literacy and course assignments.

Assessment

We had two sources of data that we used for this assessment. The first was a survey to assess mastery of specific skills by trying to ascertain students' research processes. The second source of data came from an analysis of the cited works for the final research assignment to determine how well they met their instructor's course requirements.

Writing faculty took on drafting the research process survey with input from our IRAPS team member. After completing the ASC tutorial, the survey asked students to document their topic/thesis statement, main concepts and keywords, and research sources. Though librarians offered input on survey questions, it was not a surprise when writing faculty presented some very different approaches on how to solicit evidence of the project learning outcomes. After much discussion, and with deadlines looming, the team proceeded with the survey created by the writing faculty and agreed to adjust the assessment plan if needed to accommodate the information gathered. The survey was provided to students in an online format and responses were compiled online as well.

Librarians developed the rubrics for the assessment, one set for the student research process survey and another for the student-cited works. Our choices (see Appendix C) were initially informed by the ACRL standards and those used by other academic libraries for first-year student-learning outcomes, such as the AAC&U VALUE Initiative for rubrics.[7] Working from the initial matrix of learning outcomes we had created for the ASC tutorial, we identified a learning outcome and created evaluation criteria for each question on the research process survey, creating a carefully labeled and annotated master rubric.

This proved another point at which we paused to revisit language and terms to ensure that the rubric was consistent with the concepts presented in the tutorial, and that the evaluation criteria was consistently applied to the results provided by the student research survey. The glossary created earlier in this process was an important touchstone as we went through this process, allowing us to quickly clarify our usage and terminology as we worked. Our

IRAPS member provided valuable advice on best practices for scoring and then transferred our rubric to an online survey platform.

We then developed our second set of rubrics to assess each student's cited works list in relation to their instructors' assignment requirements. We first analyzed participating writing instructors' assignments to identify research requirements held in common among all classes to use as performance criteria and created a rubric describing evaluative criteria, definitions for criteria at particular levels of achievement, and scoring strategy. Once again, our IRAPS member provided invaluable help with turning this rubric into an online scoring sheet that greatly enhanced our ability to input and share results.

Norming

The UET librarians took the lead on scoring. To support inter-rater reliability, we developed a team approach with 10 two-person teams. Each librarian was assigned to four different teams and librarians served as team leader for two of their four teams. Team leaders were responsible for scheduling team meetings, entering responses into the survey instrument, and ensuring that the process was completed in a timely manner. Each team evaluated approximately half of one class section and each librarian evaluated a portion of all four different class sections, approximately forty students per librarian. This arrangement ensured that teams were comprised of all variations of combinations for all five UET members. Student survey results and their list of cited works were not scored independently; both members of a team were present to help ensure consistency in rubric application.

As with all rubric norming, we engaged in numerous group practice sessions, discussing and documenting scoring guidelines in great detail as we worked towards consistency in application.[8] However, even though we were aware that this process could be lengthy, we were taken aback by the amount of time we needed to reach a shared and reliable understanding of scoring. With variations in how students answered the surveys and compiled their cited works, we found that even with our glossary, there was still confusion and inconsistency in how to apply our rubric. After much discussion, we created an AiA Scoring Process Sheet (see Appendix D) to document exactly what our decisions were on how we applied the rubric to each data source, what additional documentation was needed, and how to assign a score. This scoring process sheet provided a roadmap we could consult as we worked and proved to be the single most important factor in helping us to maintain a consistent approach to evaluation and scoring.

Conclusion

Creating the research process survey and scoring rubric involved challenges. With our differing backgrounds and terminology it was often difficult to accurately communicate opinions and viewpoints. Establishing a common language and understanding of each team member's perspective was key to working together effectively and was a major factor in the success of this assessment project. The matrix of common concepts was our touchstone as we developed our survey and rubric and resulted in a more productive work environment and potentially richer assessment result than we had initially envisioned.

This project had more than just the assessment of a tutorial as part of its agenda. An important aspect was the outreach and partnership building with key members of the campus community. This collaboration has led to an invitation to the library from the Writing Program to provide input in developing new information literacy learning outcomes and has the potential to allow the library to align with the Writing Program in a way that could provide a trajectory that goes well beyond this collaborative project.

Librarians are an essential part of the diverse community of campus stakeholders focused on student success. Establishing a mutually understood and shared foundation of concepts is critical if we wish to collaborate successfully with these stakeholders on assessment projects and ultimately integrate information literacy into campus learning outcomes and student success goals. The process of developing and normalizing a collectively accepted understanding of information literacy between librarians, faculty, and institutional research partners was more of a challenge than anticipated and required research, discussion, documentation, and patience to achieve.

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Appendices

Appendix A

Information literacy matrix: standards, Writing Program objectives, library skills (https://tinyurl.com/ilmatrix)

Appendix B

Rubric glossary (https://tinyurl.com/rubricglossary)

Appendix C

Rubric for library AiA project with ACRL framework (https://tinyurl.com/rubricaia)

Appendix D

AiA scoring process sheet (https://tinyurl.com/processsheet)

Student Instructional Histories: An Approach to Assessing the Reach of an Information Literacy Program

Erica Schattle and Joshua Quan
Tufts University, USA

Megan Bresnahan
University of New Hampshire, USA

Introduction

In order to fulfill the requirements of accrediting bodies and professional organizations, information literacy programs traditionally report seat counts and the number of workshops offered. These library-centric data portray a somewhat limited picture of the pedagogical and curricular impact of information literacy instruction; they count seats, not students. The metrics neglect to represent the educational experience of the student and the institutional context in which the instruction occurs. To more accurately represent the reach and complexity of information literacy programming, a more nuanced and data-rich understanding of student pathways through the curriculum, and their exposure to the library along the way, is beneficial. This project integrates the methodology of curriculum mapping with data from student course registration and information literacy instruction to develop an expanded portrait of how students gain information literacy competencies as undergraduate and graduate students.

Background

The Research and Instruction department within the Tisch Library at Tufts University, among other services, provides information literacy instruction to the School of Arts and Sciences and the School of Engineering. While individual teaching librarians are assigned liaison departments for which they provide information literacy instruction, all research and instruction librarians also participate in teaching within the First Year Writing Program, which makes up a large portion of the overall instruction load for librarians, despite being outside of their disciplinary liaison responsibilities. To maximize the reach and impact of the instruction program that aims to grow outreach and instruction in key areas (graduate students, new programs, underserved populations, or departments), care must be taken in how finite instruction capacities are distributed. Librarians in this study, given this limitation, decided to look closely at two populations of students who receive library instruction at Tufts University: freshmen students enrolled in first-year writing courses and graduate students in the Urban and Environmental Policy and Planning program.

Courses offered through the First Year Writing Program fulfill a "Foundation Writing" requirement that undergraduate students are expected to complete as freshmen. Liberal arts students are required to take two semesters of college writing, and engineering students are required to take one semester of college writing in order to graduate. However, students may fulfill one or both parts of the writing requirement through standardized test scores, such as a score of 4 or 5 on the Advanced Placement English Language and Composition Exam. Without looking at course registration data, it is not possible to tell how many students take zero, one, or two first-year writing courses as freshmen.

First-year writing courses are taught through the English, philosophy, and education departments. Courses taught through the English department include information literacy outcomes, and students are expected to write at least one 5–7 page paper using research. Beyond common course learning outcomes, there is a wide range of instructor approaches, expectations and assignments to the "research paper." As a result, some classes have a clearer fit for information literacy instruction than others.

The Urban and Environmental Planning and Policy program (UEP) is a small two-year master's degree

program enrolling 35 new students each fall on average. Unlike the First Year Writing Program, there is one library liaison to UEP. There are five core classes that all students must complete and five areas of curricular focus. The curriculum is practice-based and shaped around competencies that include skills for policy research, community building, and quantitative and qualitative analysis. Like the First Year Writing Program, opportunities for information literacy instruction vary depending on instructor approaches, type of research product, and curricular focus. The library has a history of working closely with the program's core courses, but collaborations with faculty teaching elective courses have been uncommon.

Literature Review

Often the collection of statistics representing library usage has been driven by the reporting requirements of professional organizations and accrediting bodies. The metrics, as a result, have largely focused on quantitative statistics such as door counts, circulation usage, and numbers of library workshops.[1] However, larger professional shifts have placed a new focus on richer assessment approaches to examine library value and qualify impact.[2] Library professionals involved in assessment now take a more critical approach to determining what should be measured and what methods for assessment will most accurately examine those questions.[3] In terms of information literacy instruction, programs may capture learning goals and lesson plans, in addition to head counts and session numbers. They may also connect that work to the academic curricula to capture a more complex portrait of what occurs in a learning environment and the impact of library instruction on student success.[4]

Curriculum mapping has been used by teaching and learning programs within libraries to identify opportunities for integrating information literacy components into disciplinary curricula and scaffold learning objectives to continuously build competencies as students move through a curriculum).[5] Curriculum mapping allows librarians to plan for where and when information literacy skills are needed by learners, as they are to move through and past threshold concepts and build on knowledge developed within the curriculum.[6] However, library instruction programs that employ curriculum mapping as an assessment tool may not be able to represent student learning outcomes in the same way that academic departments do, because they may not have control over the frequency or amount of time when they are able to work with students.[7]

Curriculum mapping may provide a tool for advancing ways to move beyond or around these contextual limitations in targeted areas of the curriculum that are primed for information literacy education. Using this process, librarians may want to use additional factors to create a fuller picture of how student learning occurs; while understanding the structure of academic department's curriculum is one piece, examining how a typical student might progress through their course work and encounter actual library instruction along the way is also valuable.

Methodology

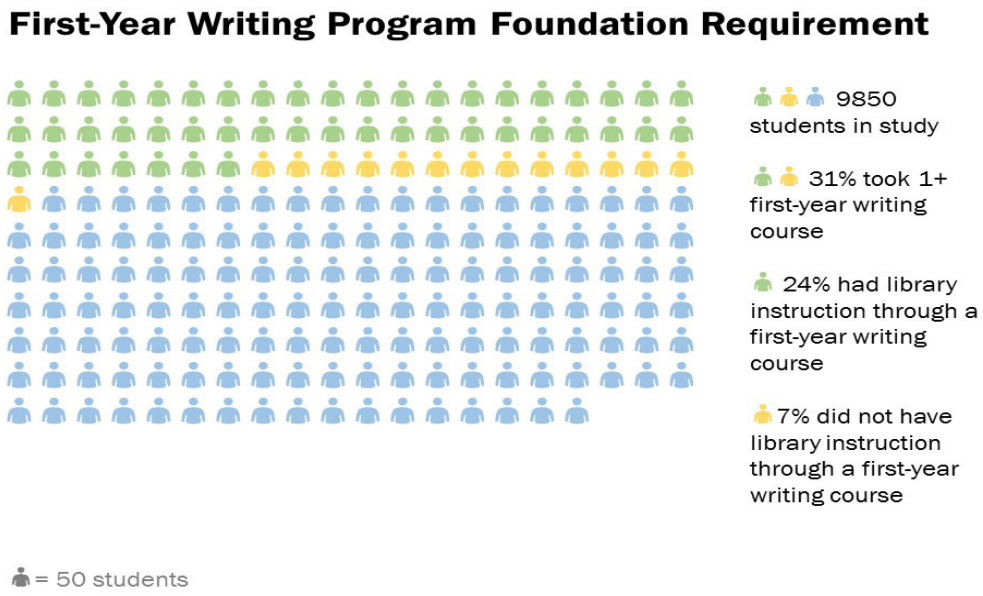
To pilot this programmatic assessment approach, this project combined and analyzed data from three sources: informational literacy program data, student course registration data, and curriculum maps representing degree requirements and course offerings. Specifically, librarians examined three years of data for one graduate program, UEP, and one undergraduate general education program, First Year Writing Program, using unique student and course identifiers. By connecting these data, librarians were able to create profiles of selected campus populations to illustrate how students encounter information literacy instruction as they move through programs and majors. The approach aims to reveal whether all, some, or no students in a course section had prior information literacy instruction and examine patterns of instructional reach and timing for different populations.

Results

First Year Writing Program

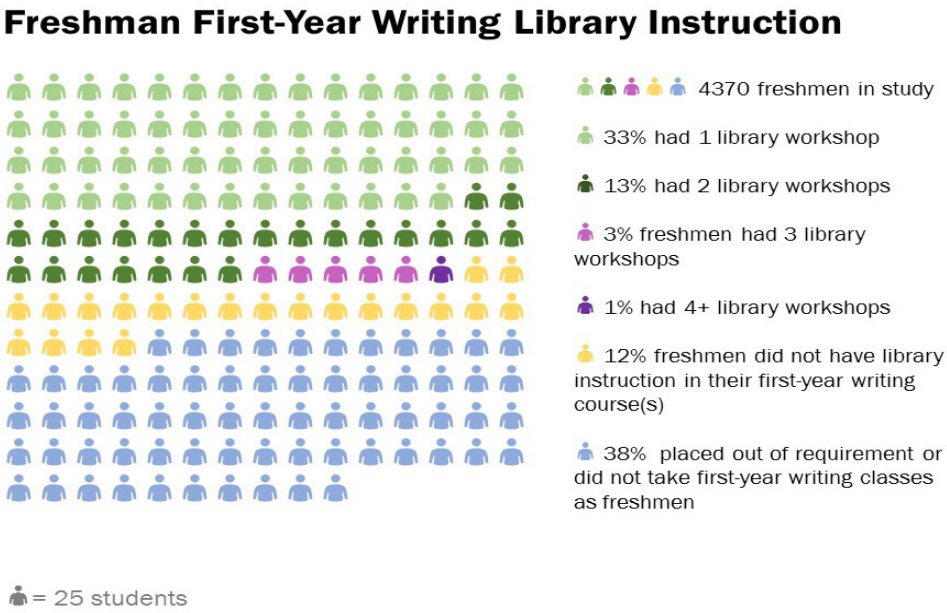
Our study included 9,850 students who took at least one undergraduate course through the Schools of Arts and Sciences and Engineering from the fall 2013 through the summer 2016 semester. During this period, 31% of students took one or more of the 349 classes offered through the English, philosophy, and education departments that fulfilled the first-year writing requirement. The library provided one or more instruction sessions for 266 first-year writing classes, reaching 24% of students through library instruction (see Figure 1).

Figure 1. Library Instructional Reach to Arts, Sciences and Engineering Students through the First-Year Writing Program Foundation Requirement



Examining the class year of students who were taking first-year writing classes revealed that 87% of students enrolled in these classes were freshmen. As students are expected to fulfill the first-year writing foundation requirement during their freshman year, it is useful to consider the library instruction experience of freshmen through first-year writing courses. Of the 4,370 freshmen in our study, 62% took one or more first-year writing courses during their freshman year. Library instruction for students varied, ranging from one to five workshops for 50% of the students who took first-year writing courses as freshmen (see Figure 2).

Figure 2. Library Instructional Reach and Frequency for Freshman Arts, Sciences and Engineering Students through the First-Year Writing Program Foundation Requirement



One challenge in planning information literacy instruction for courses that fulfill the second part of the first-year writing requirement is that class sections include a mix of students who may be experiencing information literacy instruction for the first, second, or third time. By examining the instructional history of each class section, librarians could consider specific information literacy outcomes from past library instruction for students in each class section. This information informed planning and improved librarians' ability to communicate with course instructors about student exposure to information literacy outcomes.

Examining registration information for additional courses taken by freshmen allowed librarians to consider alternative teaching scenarios to improve the reach of library instruction and reduce the teaching load for librarians. Librarians examined syllabi for the 50 highest-enrollment classes for evidence of strong information literacy components and identified three high-priority classes: Intro to Psychology (PSY-0001), Intro to Community Health (CH-0001), and Intro to International Relations (PS-0061) (see Figure 3). Thirty-five percent of freshmen in our study took one or more of these classes during their freshman year, making them key targets for outreach to develop programmatic partnerships.

Figure 3. Potential Instructional Reach and Teaching Load for Freshman Classes with Strong Information Literacy Components

Courses	Class Sections Offered During Study	Potential Number of Freshmen Reached	Potential Freshmen Instructional Reach
• First Year Writing Program	349	2185	50% of freshmen

Courses	Class Sections Offered During Study	Potential Number of Freshmen Reached	Potential Freshmen Instructional Reach
• Intro to Psychology (PSY-0001) • Intro to Community Health (CH-0001) • Intro to International Relations (PS-0061)	21	1535	35% of freshmen

Urban and Environmental Policy and Planning
During our three-year data period, 203 students were enrolled in UEP, and 85 courses were offered. Out of a population of 203 students, 103 students were enrolled in a course where library instruction was offered in some form at least one time. These sessions were typically between forty-five and ninety minutes in length. One-fifth of these students received library instruction during the sample period three or more times. Problematically, a sizable number of students received repeated librarian instruction while nearly 50% of students received no library instruction at all. This initial analysis revealed the inconsistent experience of students in the UEP program with information literacy instruction (see Figure 4).

Figure 4. Library Instructional Reach

Number of Instruction Sessions	Count of UEP Students	Percentage of UEP Students
0	100	49%
1	27	13%
2	33	16%
3+	43	21%

Our approach to understanding the instructional histories of students in the UEP program is slightly different than with freshman students in the First Year Writing Program. The UEP population is a defined group that moves through the master's program in a fairly structured way. There are requirements associated with a core curriculum and categories of electives that students who complete the program must fulfill (see Figure 5).

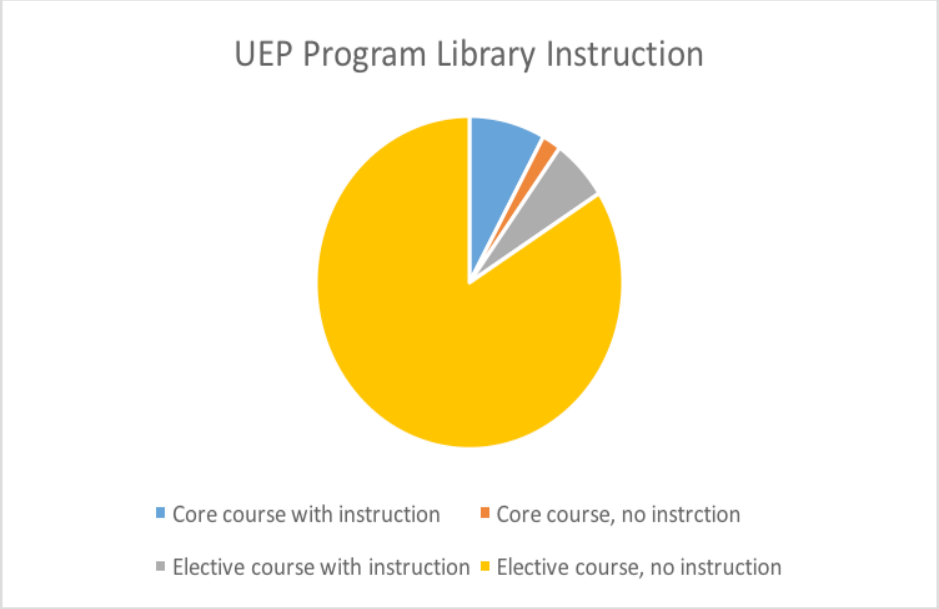
Figure 5. Urban and Environmental Policy and Planning Curriculum and Instructional Reach

Core Courses	Elective Course Categories
• Foundations of Public Policy and Planning • Economics for Policy and Planning Analysis • Cities in Space, Place, and Time • Quantitative Reasoning • Field Projects: Planning and Practice	• Sustainable Environment • Social Justice and Community Development • Policy and Governance • Built Environment and Design • Methods and Techniques

Core Courses	Elective Course Categories
4/5 core courses had library instruction at least once during the three-year study period	*3/45 elective courses had library instruction at least once during the three-year study period*

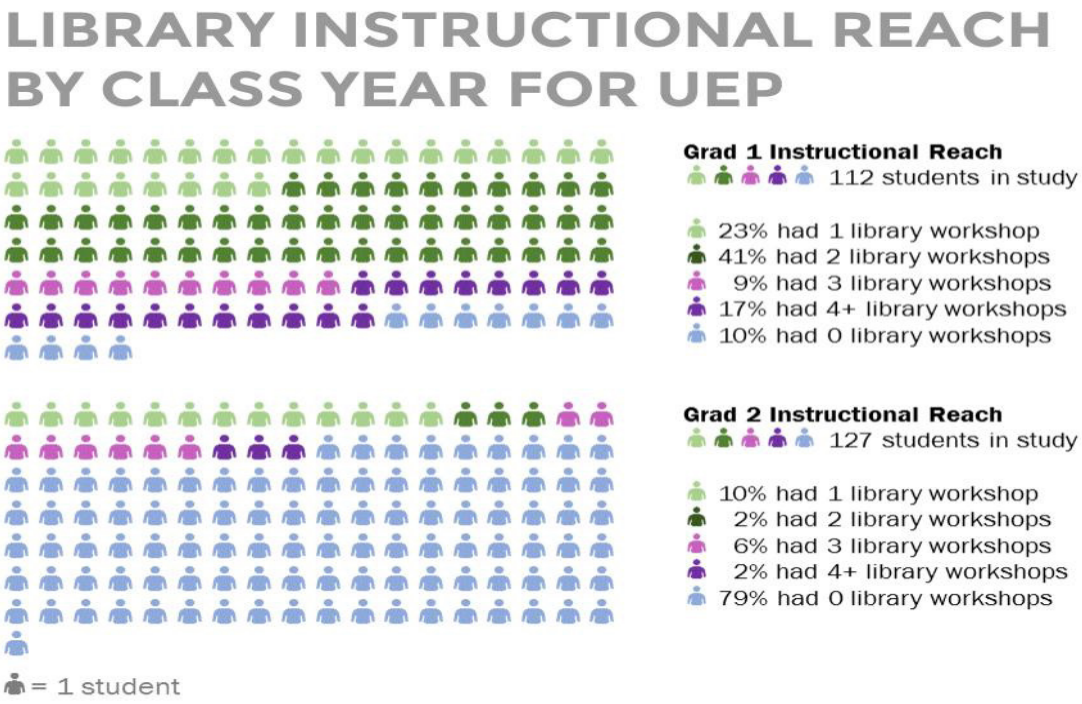
Librarians have provided information literacy instruction in only 6% of all courses offered in the UEP program; however, those instructional contacts have included most core courses in the program, which have higher enrollment than elective courses. Thus, involvement in a limited number of the program's courses has still resulted in contact with over half of all students in this study (see Figures 6 and 7). This review revealed that, while librarians did not work with half of the students enrolled in the program, involvement in a very small proportion of courses did have a substantial reach to the population.

Figure 6. Library Instruction for Urban and Environmental Policy and Planning



The timing of information literacy instruction typically occurs in the first year of the UEP graduate program for students. During the second year of the program, when students are more likely to be enrolled in elective courses, they receive library instruction far less frequently (see Figure 7).

Figure 7. Instructional Reach by Year in Program for Urban and Environmental Policy and Planning



Though targeting all areas of the core curriculum may seem like an obvious way to provide information literacy instruction to all students, it has only reached half of the students in the program due to inconsistencies in who teaches each course and when a student enrolls in a core course within the program. Further, integration within the core courses in the UEP program is not consistent or equal; that is, librarians worked with some courses regularly or several times a semester, while in others, librarians may have only worked with a course one semester within the timeframe of this study. This inconsistency is the result of a reactive instruction program built on requests from individual faculty, not intentional outreach based on where library instruction fits best within the program. Though this common model may be problematic for library instruction programs, it is not necessarily one that is not worthwhile in terms of contact with students and building faculty relationships. However, the information garnered from this analysis provides a lens for how librarians might consider expanding or contracting our instruction resources in strategic ways.

This methodology allowed librarians to ask important questions about whether our involvement in the core courses was as valuable, impactful, and efficient as targeting other parts of the curriculum, and question how many students might be reached if librarians taught in different areas of the curriculum. For example, librarians might consider not teaching in a core class that lacks a formal research assignment and instead target a related elective on a similar topic with a high enrollment and a research assignment as part of the course requirements.

These considerations lead librarians to conduct a review of course syllabi for the UEP program to identify key courses with strong information literacy components and compare that information with student enrollment data, timing, curriculum requirements, and information literacy instruction statistics. Several observations resulted from this review, which will inform future outreach and curriculum planning in the library. Several examples are included below:

- UEP 234: *Qualitative Skills for Planning and Public Policy* is an **elective course** that is a practice-based introduction to public policy planning. Students are required to understand research methodologies and use both primary and secondary data. While these requirements demand information literacy competencies, there are no related research-based assignments in the course other than an extra-credit research

paper. This is a small class (only eight graduate students), and the library has worked with the class only once during the sampling period. **Recommendation:** This course is an example of a low-priority target for growth in the instruction program. Future outreach to this area of the program is not an urgent need.

- By contrast, UEP 252: *Cities in Space, Place, and Time* is a **core course** that revealed itself to be a high priority for information literacy instruction. This course aims to critically examine urban environments, and students are required to find and use information about a variety of community stakeholders to create an interactive map. This assignment requires students to synthesize a good amount of grey literature and data. The course has a comparatively large enrollment of students, and librarians may find opportunities to support the students learning through data and GIS services, digital design, and information literacy skill development. The library has offered three instruction sessions for this course, but they were all held in the fall of 2013. **Recommendation:** Given these factors, reengaging with this course will be an important goal within the instruction program.
- In the **elective course** UEP 285: *Food Justice: A Critical Approach*, students learn to critically examine the development of systematic structural and socio-spatial inequities and injustices in food systems. Librarians have never worked with this course, though there are a number of interesting opportunities to support the development of information literacy skills. As the students are introduced to frameworks for understanding policy developments related to food, information seeking behaviors that employ a critical lens to investigate whose perspectives are represented in existing information power structures in communities and scholarship will be important. This is a project-based course where groups will be required to define a food issue or research question and synthesize regulations, legal information, public opinion, and scholarly research to inform their analysis. **Recommendation:** This course has an enrollment that is average in size, which, coupled with a strong information literacy component, will be an excellent focus for future instruction outreach.

Librarians learned that not all information literacy instruction is created equal in the UEP program, so integrating the data points of student registration, curriculum documentation, and library instruction exposes key opportunities to integrate new and emerging library services and expertise and examine if librarians are in the right places within the curriculum at the right time. This analysis helped answer questions about instruction and outreach priorities within programs and departments supported by the library. It is a frame for librarians to understand our instruction outreach priorities, but it does not mean that they will stop teaching in those courses. Instead, it is a way of understanding and reflecting on the economy of our instruction effort.

Conclusions

This student-centered approach to assessing an information literacy program—using curriculum mapping and course registration data—accounts for the frequency, timing, and depth of library instruction. By connecting available data and analyzing its complexity, librarians discovered a valuable tool for scaling and setting strategy in instruction programs. There are few libraries that claim to be well staffed, particularly in areas of public service. This approach informs our understanding about both the impact and effectiveness of our current instruction, as well as targets for future growth, so that the time and effort devoted to library instruction is maximized.

This project advances the conversation about developing meaningful and comparable library metrics for information literacy programs. The approach can be adapted to suit the available student data streams and assessment needs of information literacy programs at other colleges and universities. The authors plan to further this analysis by evaluating related research consultations in the programs examined for this study and develop tools they can repurpose for conducting future investigations.

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Understanding Research: Assessing Library Impact on Academic Performance through an Online Courseware Pilot

Karen Dearing and Ashley Shealy
Middle Tennessee State University, USA

Abstract

In spring/summer 2015, instruction librarians at Middle Tennessee State University's Walker Library designed and implemented a pilot research study that involved supplementing traditional, face-to-face library instruction with online information literacy courseware. The underlying purpose of the pilot study was to investigate the feasibility of using online courseware as an extension of Walker Library's instruction program. Instruction librarians hypothesized that this method of supplemental instruction and outreach could be sustainable over the long term for a wide variety of classes and would produce measurable data to illustrate the library's impact on overall student academic success. Instruction librarians began the study by selecting a focus for the pilot: a required, research-heavy, undergraduate course with a notable drop/fail/withdraw rate. After mining the course syllabi for learning outcomes and core concepts, librarians created an online courseware package branded as "Understanding Research," designed specifically to align with and support the textbook and various in-class assignments. As an added bonus, the courseware design included built-in assessment components that would allow librarians and instructors to evaluate student performance over the course of the semester, while also collecting valuable data on academic achievement, concept mastery, and online instruction. Librarians established a partnership with a willing faculty member and piloted the courseware within 10 sections of a communications course in the fall 2015 and spring 2016 semesters.

This short paper will discuss the results and findings of the Understanding Research pilot study, primarily focusing on courseware design, student academic performance data, survey data and feedback from pilot participants, library instruction assessment data, and the implications of the study, both at the library and university levels.[1]

Introduction

Academic reference and instruction librarians possess a unique perspective on student research habits and their grasp (or lack thereof) of important information literacy skills. In the instruction role, librarians provide expert guidance and encourage hands-on, active learning so that students may practice and utilize these skills; in the reference role, librarians see first-hand at the reference desk and other service points which questions still linger in students' minds and which issues still trouble them long after the one-shot instruction session has ended. In our experience, reference desk interactions often inform or supplement the content of our instruction sessions, which in turn enable to us better answer questions at the reference desk. It is often a cyclical process, one that enables us as information professionals to see a holistic picture of the student experience with information literacy concepts and their various approaches to conducting college-level research.

In many cases—both in one-shot sessions and through reference desk interactions—we have observed a particular problem that is certainly not unique to our institution: students demonstrate a significant gap between learning and actually applying these important information literacy skills. Students may understand that they need a certain number of sources for a research project based on their professor's requirements, coupled with a vague idea of where to find these sources. However, most students ultimately struggle with the more advanced concepts and issues that arise *after* they have begun searching; evaluating information and selecting appropriate resources, incorporating credible source material into research and writing, and citing resources are only a few of the concepts with which students continuously struggle as they work through the research process.

Instruction librarians typically have a very small window of time to make a meaningful difference in this area through just a general one-shot library

instruction session. Librarians often receive faculty feedback (both anecdotal and quantitative) that supports these observations: many professors lament that, by the time the point of need arises, students have either completely forgotten or have disregarded what they learned in a library instruction session, usually reverting back to cursory Google searches and free web resources for source material.

Background

For instruction librarians at MTSU's Walker Library, the problem and ultimate question became: how can librarians attempt to bridge this widely-seen gap between the timing of library instruction and the successful application of information literacy skills outside the library classroom? Short of embedding an individual librarian in every single general education course, how can we reach all of our freshmen and sophomore students in a reliable, standardized, interactive, sustainable way? If we could find a way to achieve this, how would the library's involvement affect course performance, retention, and/or graduation rates? These are just some of the questions we sought to explore and measure over the course of this study.

In addition to anecdotal data, our pilot study was designed and revised using several pieces of internal assessment data from MTSU's English and communication studies departments. Both departments found a key information literacy problem potentially affecting student success over the long term. Results for the shared learning outcome, "students are able to manage and coordinate basic information gathered from multiple sources," were poor: 51.7% of ENGL 1020 (Research and Argumentative Writing) students scored in the "unsatisfactory" category[2] while 43% of COMM 2200 (Fundamentals of Communication) students scored in the "inadequate" and "severely inadequate" categories.[3] This data supports the notion that students appear to be comfortable with locating secondary sources, yet struggle with how to actually evaluate source material and incorporate it into their writing.

This identified disconnect was also apparent in our internal library instruction assessment data. According to Walker Library's Faculty Feedback Survey on Library Instruction conducted at the end of fall 2014, while "100% of [faculty] respondents indicated that library instruction had a positive impact on their students' **selection** of quality information sources for their researched assignments," 69% of English and communication department faculty noted that "**integrating** information sources into the body of their writing" was still a consistent problem for students, even after a library instruction session.[4]

Clearly, these assessment reports illustrate major improvements are needed across the board for general education courses, specifically in terms of helping students understand and apply methods for incorporating research into their writing. The authors speculated that some sort of asynchronous, supplemental instruction technology would have to be employed to bridge the gap between library instruction and research/writing in a meaningful way, and to measure and capture the process along the way.

Purpose

To this end, the underlying purpose of our yearlong pilot study was to investigate the feasibility of using online information literacy courseware within a specific general education course as an extension of Walker Library's instruction program. The aim was to determine what measurable effects supplemental information literacy courseware would have on students' ability to apply information literacy concepts outside of those covered in a one-shot instruction session. Instruction librarians hypothesized that this method of supplemental instruction and outreach could be sustainable over the long term and would not only produce meaningful data to illustrate the library's impact on overall student academic success, but would show a sustainable model of supplementing traditional one-shot library instruction that could potentially be implemented in a wide variety of classes taught at the university.

Designing the Pilot Study

Our pilot study design began with determining which of MTSU's general education courses would most benefit from supplemental information literacy courseware. We consulted the aforementioned program assessment data from various academic departments, internal library instruction assessment data, and the most recent university report on predictive courses with notable drop/fail/withdraw rates. Here, we identified two possible general education courses for our study: ENGL 1020: Research and Argumentative Writing and COMM 2200: Fundamentals of Communication. Both

courses are mandatory for all majors and require students to conduct extensive research throughout the semester.

The next step in the project design was to select an appropriate online courseware platform. The authors evaluated several products based on a variety of factors: content of module lessons, alignment of lesson content to ACRL information literacy standards, ease of use and access, options for content creation and customization, ADA-compliance, compatibility with learning management systems, and analytic/assessment capabilities. In spring 2015, we determined that the Credo Information Literacy courseware best met our needs. After purchasing a yearlong contract, we began designing and branding the customizable courseware, which we named: "Understanding Research Courseware" (URC).

For us, one of the more important aspects of the courseware platform was the assessment component: we wanted to be able to capture and analyze how students performed in the courseware over time and have the ability to record their involvement and activity within the courseware platform. The module contents of the platform we chose were intentionally populated with a variety of learning objects which could all be assessed in various ways: videos, informative slides, multiple choice questions, interactive exercises that reinforced lesson material, and a few open-ended discussion questions to evaluate how students applied the concepts presented. Students would immediately receive scores for completed work with the exception of the open-ended questions, which would be hand graded using a rubric. The other analytics would be collected within the password-protected platform, and would be accessed and stored within Excel spreadsheets. Only the authors and the course instructor would have access to the course analytics. Outside of the courseware platform, we also planned to conduct a student survey and assess a sample of student-submitted bibliographies for their final persuasive speeches.

Designing and Mapping the Courseware

Recruiting a faculty collaborator and mapping the courseware content to the faculty member's syllabus were the last components of the project design before launch in fall 2015. Ultimately, we partnered with a professor who exclusively taught COMM 2200. Our faculty collaborator was also known to be a flexible innovator in the classroom, making heavy use of the flipped classroom model and various pedagogical technologies.[5] We mined his course syllabus, assigned textbook, and course timeline for relevant and important information literacy concepts that would match with the courseware module content. We then strategically mapped the online courseware content to the professor's course timeline to determine when in the semester the courseware modules should occur (and in what sequence) to best support student learning and point-of-need assistance.

In the end, seven modules were selected for the pilot study:

- Academic Integrity
- Presentations
- Types of Sources
- Search Strategies
- Evaluating Information
- Extending Evaluation
- MLA Citations

A unique login link for each section's courseware was placed within their D2L course shell (MTSU's learning management system) so that students would have quick and easy access to the URC.

Student Demographics and Course Enrollment

This pilot study included 10 course sections of COMM 2200, with a total enrollment of 240 students. Classes were populated with a variety of student classifications and designations. Student ages ranged from 18 to 56 with an overall average of 20.64. 85% were classified as freshmen and sophomores; an overwhelming majority—81%—were classified as continuing students. Because COMM 2200 is required for all students regardless of major, we feel the students participating in the pilot study are a good reflection of the MTSU freshmen and sophomore student body.

Notable Findings—Don't Make Us Think!

Our yearlong pilot study produced several notable findings with regard to student behavior, courseware completion/performance, and potential effect of the courseware on resource selection and final grades. Across the board, regurgitation of information and concepts was not a problem for students. Furthermore, our student survey revealed that regurgitation along with questions that allowed students to guess at the answers were the most preferred assessment techniques. On the

flip side, critical and independent thinking were sticking points for practically every student and predictably the most hated in terms of assessment techniques. Unfortunately, the courseware did not produce measurable indications that it improved student ability to apply abstract information literacy concepts.

Students Struggle Equally with Academic Integrity and Source Evaluation
Just as we had hypothesized and had seen from other pieces of assessment data, the courseware confirmed that students struggled most with critical thinking and answering open-ended questions that required application of information literacy concepts, particularly those related to aspects of source evaluation (the difference between a scholarly article and a website, etc.) and academic integrity (plagiarism, theft, paraphrasing, etc.). Responses to the open-ended questions from both modules were sometimes surprising and provided insight into student thinking and attitudes.

Within the academic integrity module, the behaviors we observed and the answers we received reinforced the notion that our students possess a different value system in terms of information ethics and grade integrity. They have been taught that copying is wrong but a generational belief emerged that copying is really not plagiarism but is instead an extension of the real-world "mixing and sampling" that happens in their everyday lives. There seemed to be a generational sentiment that current plagiarism and information ethics taught by educators are too old, too restrictive, and not in touch with the real world. One student response summed up this sentiment perfectly: "Stealing is a form of flattery."

Use of URC Correlates with Improved Academic Performance and Increased Use of Library Resources
In order to gauge student ability to apply URC concepts within their assignments, 46 bibliographies and speech outlines were randomly selected and evaluated for resource quality and source incorporation based on a rubric designed to reflect the source evaluation material presented in the URC. In addition, researchers also made note of the number of library resources included within each bibliography and speech outline. The rubric quality scores and the number of included library resources were then compared to a baseline bibliography (produced in a previous semester, pre-implementation of the URC pilot) submitted by the course instructor. When compared to the baseline bibliography, the quality of bibliography contents produced by URC students improved by 18% and the use of library resources increased by 21%.

Another notable finding borne out of the random sampling showed students who incorporated library resources into their final speech outlines and bibliographies performed better on their final persuasive speeches than those who only used free, web-based resources. Students using at least one library resource scored 4% higher than the average for all student bibliographies and 7% higher than students using only web resources.

Students who utilized library subscription resources also performed better academically in the course overall than students who did not incorporate any library resources. In addition to the higher score on their persuasive speeches, students using at least one library resource scored on average 9% higher in the URC grades, final speech grades, and the overall course grades. For students enrolled in COMM 2200, a 9% improvement is equivalent to one letter grade.

Preparation for Research Makes a Difference
Collected performance data also showed that students who completed the ENGL 1020 composition course before taking the COMM 2200 public speaking course had higher overall grades and submitted higher quality research bibliographies. On average, COMM 2200 students who previously completed ENGL 1020 scored 4% higher in both bibliography quality and final course grades when compared to their classmates who had not completed ENGL 1020.

Unfortunately, 82% of the 240 students enrolled in our pilot study elected to take COMM 2200 before completing the ENGL 1020 course. We believe this is an important consideration in terms of academic advising and curriculum emphasis. In addition, we believe this could be a contributing factor to the poor student research performance both observed and obtained in this study.

Practical Implications/Value

This courseware pilot study provided a number of practical implications and suggestions for both the library and the university as a whole. For one, the authors believe the pilot results show that library instruction must be supplemented, not removed

from the course curriculum entirely. Of the students we surveyed during this project, 87% reported that the in-person, face-to-face library instruction session was helpful. It is our view that an online courseware suite, though valuable and helpful for content reinforcement, must support and supplement library instruction, not replace it altogether.

Secondly, based on our findings, we can reinforce the assertion that students seem to struggle most with understanding the concepts of information ethics, academic integrity, and evaluation of information sources. Information ethics and academic integrity in particular must be addressed in a project like this, regardless of the course in which the courseware package is embedded. Evaluation of sources for authority, credibility, and bias must also continue to be addressed within library instruction classes and semester-long courses, especially as information continues to become freely available online and as students insist upon relying on Google for research purposes. In the library, we can do our part by emphasizing this aspect of research more heavily within our library instruction sessions and by creating new approaches that target generational differences relating to information ethics.

Further-reaching, however, we strongly recommend the Communication Studies department require the graded evaluation of research sources cited in the bibliography component of student speeches. Our evaluation of the bibliographies was eye-opening, to say the least. Unless students receive positive reinforcement for careful evaluation and use of credible sources and/or negative reinforcement for sloppy evaluation and use of weak sources, their research behaviors will not change or improve.

Conclusion and Further Reading

Supplemental online information literacy courseware has incredible value and many potential uses. Results obtained in this pilot study show a positive correlation between the use of online information literacy courseware and improved academic performance for students in a general education course. However, our study design used online information literacy courseware to supplement one-shot instruction sessions; therefore, the authors are unable to measure the influence of the courseware and one-shot sessions separately—only in combination with each other. With adequate financial and personnel support, it is our view that online information literacy courseware demonstrates potential for becoming a useful instructional and outreach tool for academic libraries seeking an opportunity to make a measurable impact on student academic success.

Notes

1. For a full summary report, please visit our dedicated URL: http://jewlscholar.mtsu.edu/handle/mtsu/5055.

2. Allison D. Smith, *Results of Assessment of General Education Learning Outcomes, Academic Year 2013–2014, Subject Area: Writing* (English Department report, Middle Tennessee State University, 2014).

3. *Assessment of General Education Learning Outcomes, Academic Year 2014–2015, Subject Area: Oral Communication* (Communication Studies and Organizational Communication Department report, Middle Tennessee State University, 2015).

4. Jason Vance, *Faculty Feedback on Library Instruction: Fall 2014* (Walker Library report, Middle Tennessee State University, 2015).

5. Stephen Decker and Thomas M. Brinthaupt, "The Flipped Classroom," in *Recent and Projected Technology Trends Affecting Business Education*, eds. K. Virginia Hemby and Robert E. Grubb (Reston, VA: National Business Education Association, 2007), 245–258.

Academic Libraries' Impact on Community College Student Success

Katy Mathuews
Ohio University, USA

Brad Pulcini
Ohio Wesleyan University, USA

Abstract
While library impact studies at individual institutions have proliferated in recent years, it is also important to grow the literature on libraries' impact on a national level. This is particularly true in the community college realm where research on the impact of the community college library on student success has been limited. Using national datasets, this study examines the impact of various institutional expenditures and library use variables on full-time retention rates, part-time retention rates, and graduation rates of community college students. As in similar studies of four-year institutions, this study finds mixed results. Though several variables are statistically significant, no variable singularly has a large impact on student success.

Introduction
With the increasing trend to demonstrate the value of academic library efforts on institutional student success measures, studies to examine library impact have proliferated. However, the findings of many studies have been mixed or inconclusive. Additionally, the study of library impact on community college student success is largely absent from the literature. This study seeks to fill the gap of community college library impact studies. Using institutional expense data and library use data, the study explores the impact of institutional expenditures and library use on three student success outcomes: full-time retention rate, part-time retention rate, and graduation rate. While uncommon in studies at four-year institutions, part-time retention rate is included due to the frequency of part-time student enrollment at community colleges.

Literature Review
Since Oakleaf's[1] call to demonstrate the impact of academic library efforts on student success and institutional goals, many studies have explored library impact using quantitative methods, including multiple regression analysis. The studies have included institutional analysis using institutional datasets and national studies using publicly-available national datasets.

Some researchers looked at comparisons of library user and non-user student populations to gain an understanding of the impact of library use on student success outcomes at an institutional level. Jantti and Cox[2] compared student outcomes among library user and non-user populations. They found that students who use library resources have higher grades than students who do not use library resources. Primarily using log-in information and circulation data, Haddow and Jyanthi[3] and Haddow[4] used descriptive statistical analysis to analyze institution-level data to find that retained undergraduate students have higher levels of library use than students who are not retained. Several other studies used statistical analysis to examine the relationship between student GPA and library variables including circulation data, electronic resource usage, workshop attendance, and computer log-ins, among others. In two such studies, positive relationships between student GPA and various library use variables were found by Soria, Fransen, and Nackerud[5] and Wong and Webb.[6]

Expanding upon the institutional approach, researchers began to apply statistical analysis to large national datasets. Researchers also began to apply inferential methods to gain a better understanding of library use on student success. The results of these studies, however, showed mixed results. Mezick[7] used national datasets to examine 586 baccalaureate institutions. Primarily using expenditure data as a proxy, Mezick found positive correlations between

student retention and the independent variables of total library expenditures, materials costs, and serials costs. Emmons and Wilkinson[8] used Integrated Postsecondary Education Data System (IPEDS) retention and graduation rate data and library data from the Academic Library Survey (ALS), including circulation, reference transactions, volumes, materials expenditures, students receiving library instruction, and the like. They found a significant positive relationship between library staffing and retention and graduation rates.

Crawford[9] sought to examine institutional expenditures and library use data using IPEDS and ALS. Studying four-year colleges in Pennsylvania, Crawford used institutional expenditure data along with library use variables including circulation, interlibrary loan, gate count, reference transactions, and attendance at instructional sessions. Rather than list each library use variable separately, Crawford constructed a library use index that was made up of the library variables mentioned. Through regression analysis, Crawford did not find a significant relationship between the library use index and the dependent variables of retention and graduation rate. Crawford did, however, find significant relationships between the dependent variables and instruction, public service, academic support, student services, and institutional support.

Though the studies mentioned above took important steps in exploring the impact of academic libraries on student success, the results are mixed and often do not show significant relationships with library variables. Further, these studies only focus on four-year institutions. The limited amount of community college research highlights a gap that could be valuable to pursue. Community college students often face increased challenges compared to their four-year college counterparts. In fact, community college students constitute more than half of single parent students, students with disabilities, first-generation students, Hispanic students, and black students. Further, community college students are more likely to be of nontraditional age and attend part-time.[10] Due to these challenges, community college students are often retained at lower rates than the four-year counterparts at 59.9% and 79.9%, respectively. For these reasons, it is important to increase the literature focused on the impact of community college libraries on student success.

Methodology

The study uses data from the 2012 reporting cycle of the Integrated Postsecondary Education Data System (IPEDS) and the Academic Library Survey (ALS) provided by the National Center for Education Statistics (NCES). The dataset included all public two-year community colleges that completed the ALS, who participate in Title IV, and award associate's degrees. Institutions who reported a zero value for any variable were excluded to address the uncertainty of true reported zero values versus non-reporting of data. There were 762 institutions included in the analysis after accounting for zero or unreported values.

The dependent variables were full-time retention rate, part-time retention rate, and graduation rate. The full-time retention rate is the percentage of full-time students who enroll in a particular fall semester who are retained to the following fall semester as full-time or part-time students. The part-time retention rate is the percentage of part-time students who enroll in a particular fall semester and are retained as full-time or part-time students the following semester. The graduation rate is the percentage of students who begin in a particular fall semester and finish in 150% of the normal time-to-degree.[11]

The independent variables include the major institutional expenses including instruction, academic support, student services, institutional support, and other core expenses. Though reported by IPEDS, research expenses and public service expenses were not included due to the low instance or nonexistence of such activity in the community college environment. Library expenditures are included in academic support expenditures, so no separate library expenditure variable was included. Given the vast array of variables in higher education that may contribute to student success, the institutional expenditure variables were used as a proxy to simplify the model and allow for a more focused examination of library use variables. Additionally, all expenditure variables are presented per full-time equivalent (FTE) to account for varying sizes of institutions. Library use variables included general circulation, reserve circulation, presentation attendees, and number of reference transactions in the reported year. Since library use variables are not reported per FTE, we transformed these variables by dividing each library use variable by the institution's reported FTE. This approach ensured all variables were presented per FTE.

Table 1 Descriptive Statistics by Variable

	N	Minimum	Maximum	Mean	Standard Deviation
Full-time retention rate	762	14%	89%	57.09%	9.38%
Part-time retention rate	762	4%	87%	39.88%	10.31%
Graduation rate	762	3%	75%	21.56%	9.97%
Instruction expenses	762	$1,639	$14,393	$4,992.17	$1,560.36
Academic support expenses	762	$51	$5,176	$986.29	$549.62
Student service expenses	762	$287	$5,885	$1,319.37	$800.90
Institutional support expenses	762	$135	$6,921	$1,820.39	$855.37
All other core expenses	762	$3	$16,241	$2,018.29	$1,364.36
General circulation	762	.0357	74.1663	4.2653	6.1578
Reserve circulation	762	.0008	37.5183	1.5499	2.6488
Presentation attendees	762	.0101	10.2863	0.7227	0.6933
Reference transactions	762	.0001	53.8378	2.3023	3.8068
Gate count	762	.0269	10.4046	1.2863	1.0384

Statistical Methods

This study employs multiple regression analysis to examine the impact of the independent variables on full-time retention rate, part-time retention rate, and graduation rate. The regression models are demonstrated below where Y_1 is full-time retention rate, Y_2 is part-time retention rate, and Y_3 is graduation rate.

$Y1 = ß_0 + ß_1$Instruction expenses $+ ß_2$Academic support expenses $+ ß_3$Student services expenses $+ ß_4$Institutional support expenses $+ ß_5$All other core expenses $+ ß_6$General circulation $+ ß_7$Reserve circulation $+ ß_8$Attendance at presentations $+ ß_9$Reference transactions $+ ß_{10}$Gate count $+ ε$

$Y2 = ß_0 + ß_1$Instruction expenses $+ ß_2$Academic support expenses $+ ß_3$Student services expenses $+ ß_4$Institutional support expenses $+ ß_5$All other core expenses $+ ß_6$General circulation $+ ß_7$Reserve circulation $+ ß_8$Attendance at presentations $+ ß_9$Reference transactions $+ ß_{10}$Gate count $+ ε$

$Y3 = ß_0 + ß_1$Instruction expenses $+ ß_2$Academic support expenses $+ ß_3$Student services expenses $+ ß_4$Institutional support expenses $+ ß_5$All other core expenses $+ ß_6$General circulation $+ ß_7$Reserve circulation $+ ß_8$Attendance at presentations $+ ß_9$Reference transactions $+ ß_{10}$Gate count $+ ε$

Limitations

This study focuses on public two-year community colleges. Thus, this study is not generalizable to four-year institutions, independent community colleges, for-profit two-year colleges, or tribal community colleges. Further, the data included in this study is only representative of one reporting year, thus time series inferences are not possible. Finally, this study uses broad institutional expenditure categories and very basic library use statistics. The study does not

include more contemporary measures of library use such as electronic resource usage, space use, or technology usage as these measures are often not yet reported comprehensively.

Data Analysis

The regression analysis for graduation rate yielded an R-squared of .099. This means that our model explained only 9.9% of the variance. Results of the analysis can be seen in Table 2. Of the independent variables, instruction expenses, academic support expenses, institutional support expenses, reserve circulation, and presentation attendance resulted in statistical significance. Instruction expenses and institutional support expenses showed both a significant and positive relationship with graduation rates. However, all variables had extremely small coefficients with academic support expenses, reserve circulation, and presentation attendance, showing a negative relationship. Negative relationships are typically not what one would expect when considering variables that are logically associated with supporting students and their academic habits. Though unexpected, negative results have been found in previous studies.[12]

Table 2: Regression for Graduation Rate—150% of Normal Time

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Standard Error	Beta		
Constant	15.719	1.423		11.048	.000
Instruction expenses	.001	.000	.210	5.187	.000
Academic support expenses	-.002	.001	-.103	-2.782	.006
Student services expenses	.000	.000	-.012	-.297	.767
Institutional support expenses	.002	.000	.130	3.260	.001
All other core expenses	.000	.000	-.024	-.680	.497
General circulation	.053	.058	.033	.905	.366
Reserve circulation	-.369	.134	-.098	-2.748	.006
Presentation attendees	-1.738	.543	-.121	-3.203	.001
Reference transactions	.014	.096	.005	.141	.888
Gate count	.273	.369	.028	.738	.461

The regression analysis for full-time retention rate yielded an R-squared of .066. This indicates that our model explains 6.6% of the variance. The regression results can be seen in Table 3. Of the independent variables, instruction expenses, reserve circulation, and reference transactions were statistically significant. Again, however, the coefficients were extremely small. Only instruction expenses and reserve circulation showed a significant and positive relationship with full-time retention rate.

Table 3: Regression for Full-Time Retention Rate

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Standard Error	Beta		
Constant	56.621	1.363		41.555	.000
Instruction expenses	.001	.000	.092	2.222	.027
Academic support expenses	-.001	.001	-.041	-1.090	.276
Student services expenses	-.001	.000	-.062	-1.559	.119
Institutional support expenses	-.001	.000	-.049	-1.198	.231
All other core expenses	.000	.000	-.025	-.696	.486
General circulation	-.051	.056	-.034	-.917	.360
Reserve circulation	.756	.129	.213	5.873	.000
Presentation attendees	-.523	.520	-.039	-1.007	.314
Reference transactions	-.231	.092	-.094	-2.517	.012
Gate count	.453	.354	.050	1.280	.201

The regression analysis for the part-time retention rate yielded an R-squared of .067, indicating that our model explains only 6.7% of the variance. Regression results can be seen in Table 4. Of the independent variables, instruction expenses, student service expenses, and general circulation were statistically significant. Again, the coefficients were extremely small with student services expenses and institutional support expenses being negative while instruction expenses were significant and positive.

Table 4: Regression for Part-Time Retention Rate

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Standard Error	Beta		
Constant	36.599	1.497		24.451	.000
Instruction expenses	.001	.000	.216	5.231	.000
Academic support expenses	.001	.001	.027	.713	.476
Student services expenses	-.002	.001	-.178	-4.477	.000
Institutional support expenses	-.001	.000	-.073	-1.794	.073
All other core expenses	.000	.000	-.052	-1.452	.147

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Standard Error	Beta		
General circulation	.135	.062	.081	2.193	.029
Reserve circulation	.170	.141	.044	1.202	.230
Presentation attendees	.254	.571	.017	.445	.656
Reference transactions	.001	.101	.000	.010	.992
Gate count	.041	.388	.004	.106	.916

Discussion

Though this study found significant positive relationships between some independent variables and graduation rates, full-time retention rates, and part-time retention rates, the effect of those variables was extremely small. The study also found several independent variables to have a negative relationship with the dependent variables. This leaves us unable to draw any broad statements about the impact of the academic library on community college student success.

This study sought to increase the body of work focused on community college libraries. Several studies have focused on four-year college and university libraries with mixed results. To date, no study has shown extensively that independent library variables have sizeable significant impacts on student success outcome, such as graduation rate or retention rate. That was also the case in this study. Though some variables showed to be significant, their impact was extremely small. Size of the impact, however, may not entirely matter. Incremental impact may at times be small. It is worthwhile to consider what a "good" size of a coefficient might be instead of assuming the higher the coefficient the better.

Additionally, the R-squared values in each model are lower than we would like. Ideally, the larger the R-squared, the more appropriately the model explains the relationships between the independent and dependent variables. The complexity of the higher education environment, however, may make it challenging to build a model that considers every variable that may impact student success.

Conclusion

As explained above, community college students often face unique challenges compared to their four-year counterparts. It is important to grow the literature on what contributes to community college student success. Libraries, in particular, can lead the charge to examine their role in supporting community college students.

It may also be time to acknowledge the usefulness of qualitative studies to gauge the impact of libraries on student success. Though accountability and funding pressures prevalent in higher education today have put a spotlight on quantitative analysis, it may not be the best approach in all cases. Given the complexity of the higher education environment, it may simply not be possible to include every variable that may impact student success measures. It may be useful, then, to examine the insight qualitative studies can provide. A qualitative or mixed methods approach may be the appropriate perspective to help community colleges and their libraries assess the impact of library engagement on community college student success in a complex higher education environment.

Endnotes

1. Association of College and Research Libraries, *Value of Academic Libraries: A Comprehensive Research Review and Report*, researched by Megan Oakleaf (Chicago: Association of Research Libraries, 2010), http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/value/val_report.pdf.

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Do We Approve? New Models for Assessing Approval Plans

Sarah Tudesco, Julie Linden, and Daniel Dollar
Yale University, USA

Introduction

Approval plans are an important part of Yale University Library's collection development strategy for monographs. The library contracts with approval plan vendors and develops approval profiles to acquire books from hundreds of publishers, from several countries, in many languages, and across a wide range of subject areas.

Approval plan assessment has been a topic in library literature for several decades.[1] Many articles discuss methods for evaluating vendor performance.[2] Circulation statistics are a traditional and often-used measure of whether an approval plan is meeting its community's needs.[3] Cost data is another common metric, particularly for assessing the cost-effectiveness of approval plans within a library's overall collections budget.[4] As patron-driven acquisitions (PDA) became important to many libraries' collection development strategies, librarians undertook comparative assessments of PDA and approval plans.[5]

Yale Library's Collection Development department and assessment librarian teamed up to build an approval plan assessment model that builds on traditional approaches to add new assessment tools and ask new questions, and particularly to consider approval plans not in their silo, but in the broader ecosystem of monograph collection and use within Yale Library and in its primary resource-sharing network, Borrow Direct. This short paper describes key aspects of this project, which is a work in progress, as well as possible future directions for approval plan assessment.

Methods

The approval plan analysis was performed with data from the Voyager Integrated Library System, which was implemented at Yale in 2002. The data includes bibliographic and holdings information (what we bought), acquisitions data (how we bought it, who we bought it from, how much we paid), and circulation information (was it used, who used it). We designed the model to capture many aspects of the acquisitions workflow and to include circulation data, which is the most consistent measure of usage in the system.

1. Getting the data
   The data in the Voyager system is in an Oracle database. Using the Oracle SQL developer reporting tool, queries were developed and refined to capture the dataset used to perform this analysis.

   Data retrieval was done in stages:

   Stage 1—Orders: The acquisitions query retrieved all the purchase order line items identified as "Approval" or "Firm." This data includes detailed information including vendor, account code, order date, price, and receipt date.

   Stage 2—Bibliographic, Holdings, and Item Records: The query captured the bibliographic data (title, author, bibliographic format, language, publisher, publication date, country of publication) and holdings data (library, collection, call number) for all the approval and firm orders. The items data includes the item ID/barcode field that is necessary to connect to the circulation system.

   Stage 3—Circulation: The circulation query filtered through the log of circulation transactions, finding the items that matched the orders/bibliographic records already captured. The query captured the circulation date/time as well as the demographic information about the patron who borrowed the material.

2. Preparing the data
   Once the three queries were run, the resulting datasets were brought together to create a single dataset optimized for analysis. The goal for the project was to build a dashboard that can be used to monitor activities over time, so building in a mechanism to update the data was crucial to the success of the project.

Figure 1: Gathering data for analysis

Title	Call#	Vendor	Order Date	Circulation	Order Type	Query Date
Title 1	P 323	Amazon	7/15/2005	5	FIRM	6/30/2016
Title 2	HV 424	Yankee	8/15/2007	NULL	APPROVAL	6/30/2016
Title 3	B 456	Harras-sowitz	9/15/2014	NULL	APPROVAL	6/30/2016

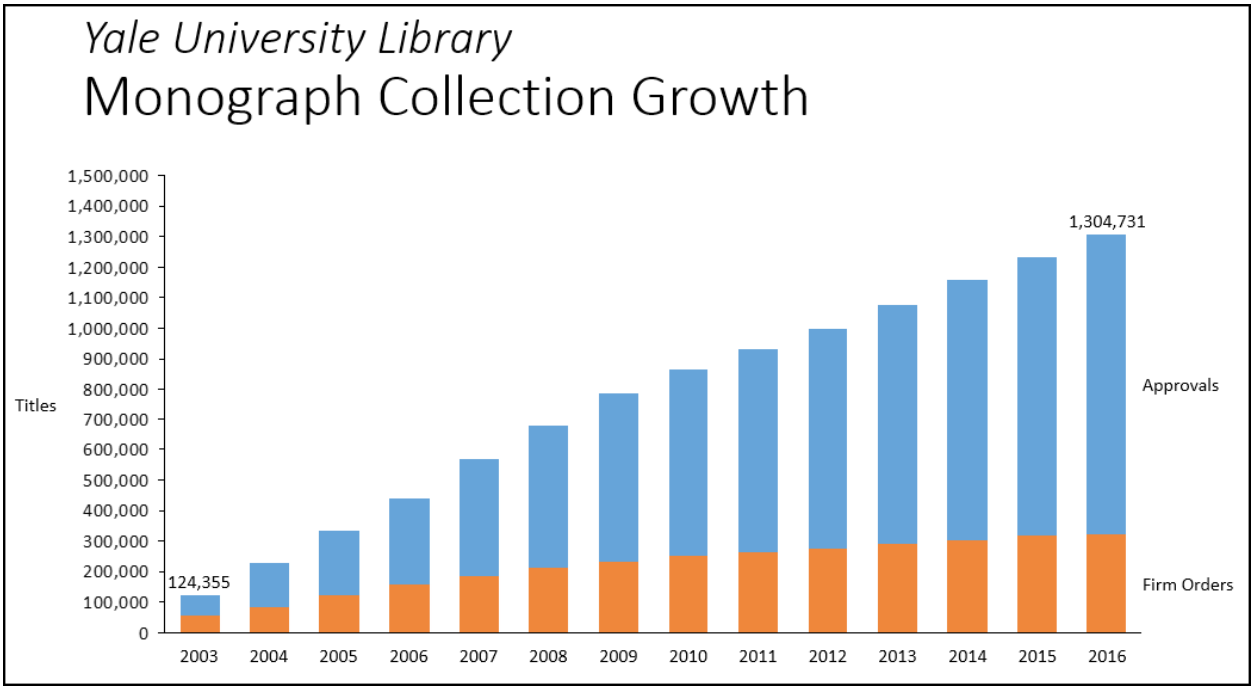
Example:

Here is an example of the unified dataset with key fields from the three queries used to build out the dataset.

Data Analysis and Visualizations

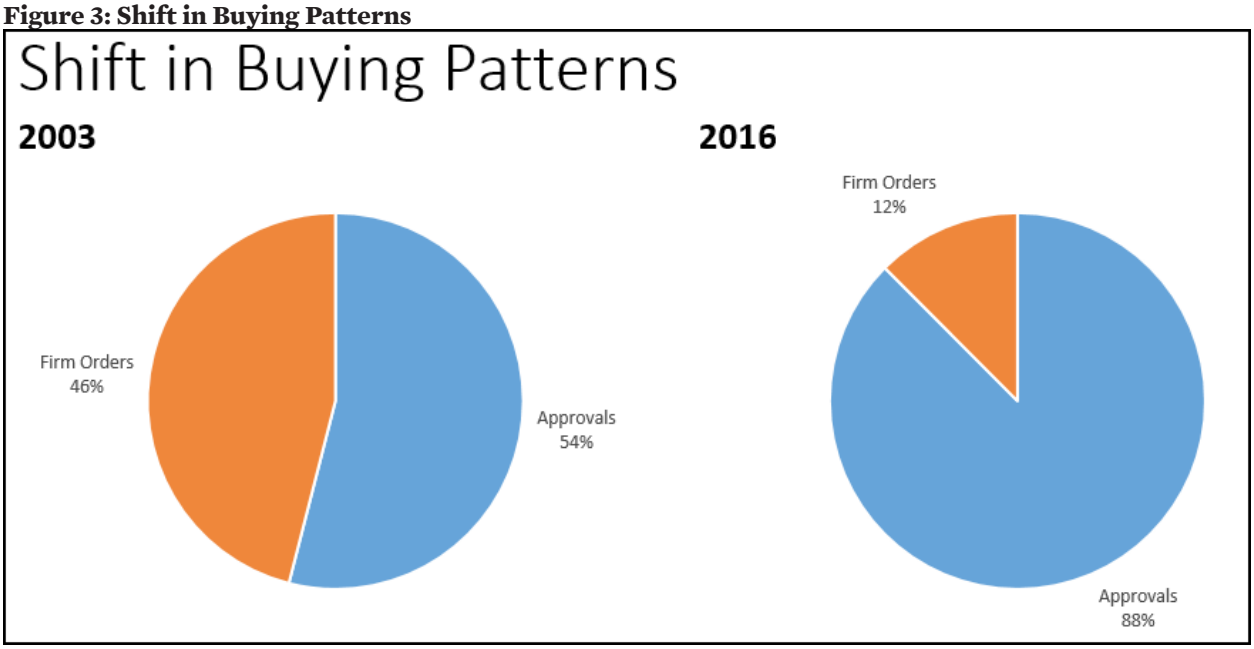
Because several Yale librarians have responsibility for monograph collection development in their assigned subject areas, it is important to summarize and communicate the results of the approval plan assessment data analysis with a wide range of stakeholders. The charts shown here are examples of data visualizations shared within Yale Library to help inform collection development decision making, to elicit questions and suggestions for further assessment work, and to foster a culture of assessment.

Figure 2: Monograph Collection Growth—Approval and Firm Orders



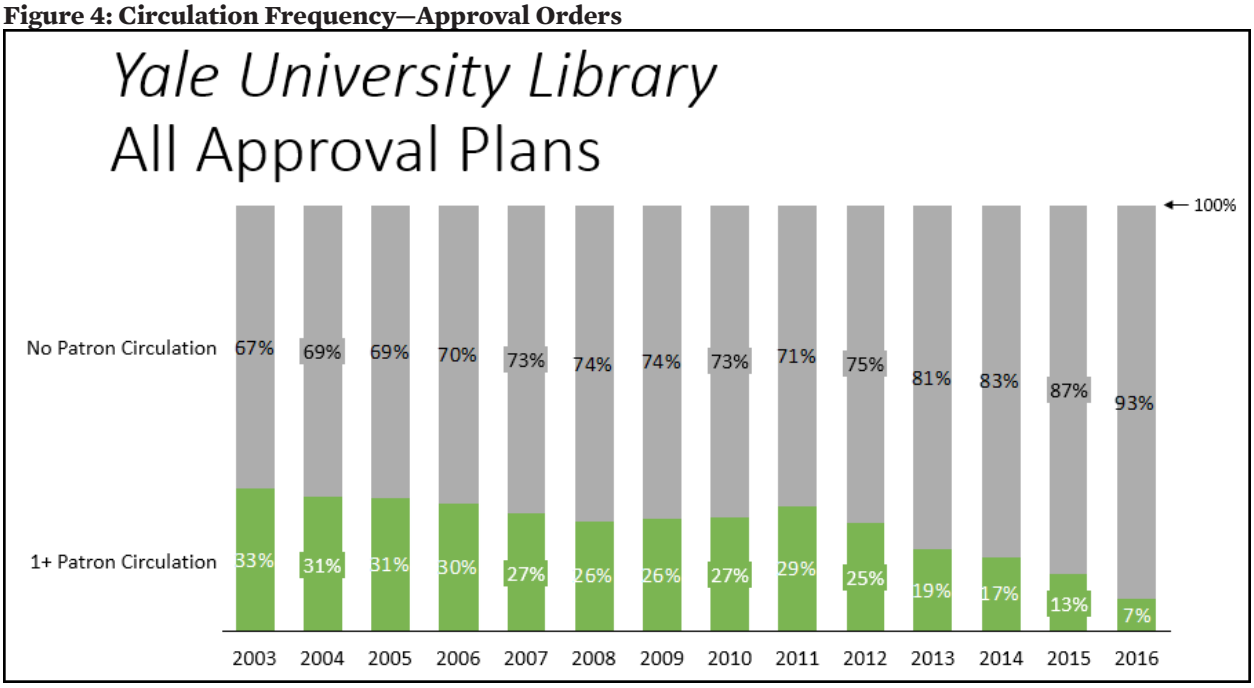
This chart shows not only how the collections have grown over the past fourteen years, but also how balance has shifted between the two primary methods of acquisition—firm order and approval. The next chart illustrates that shift even more starkly, with snapshots from the earliest and latest years in the timeline. Yale Library now uses approval orders for 88 percent of its monographic acquisitions.

Figure 3: Shift in Buying Patterns



When the circulation data is combined with the holdings data for approval items, the circulation activity starts to tell an interesting story.

Figure 4: Circulation Frequency—Approval Orders

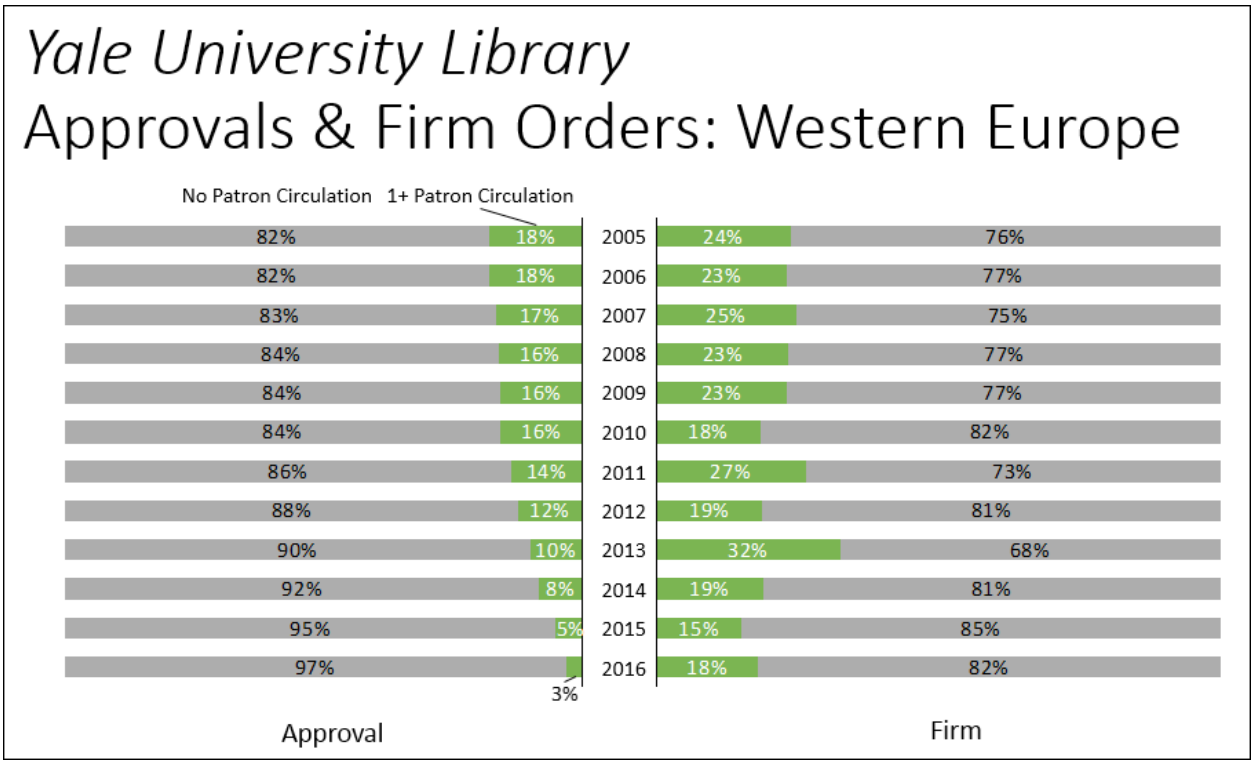


These patterns appear to align with other institutions' analyses of circulation shelf life.[6] The percentage of material that has been used by a patron is less than half, even when the books have been on the shelf for a significant period of time. This chart is a high level view—all approval vendors, all subject areas.

The detailed dataset allows us to isolate and explore specific pieces of the overall approval

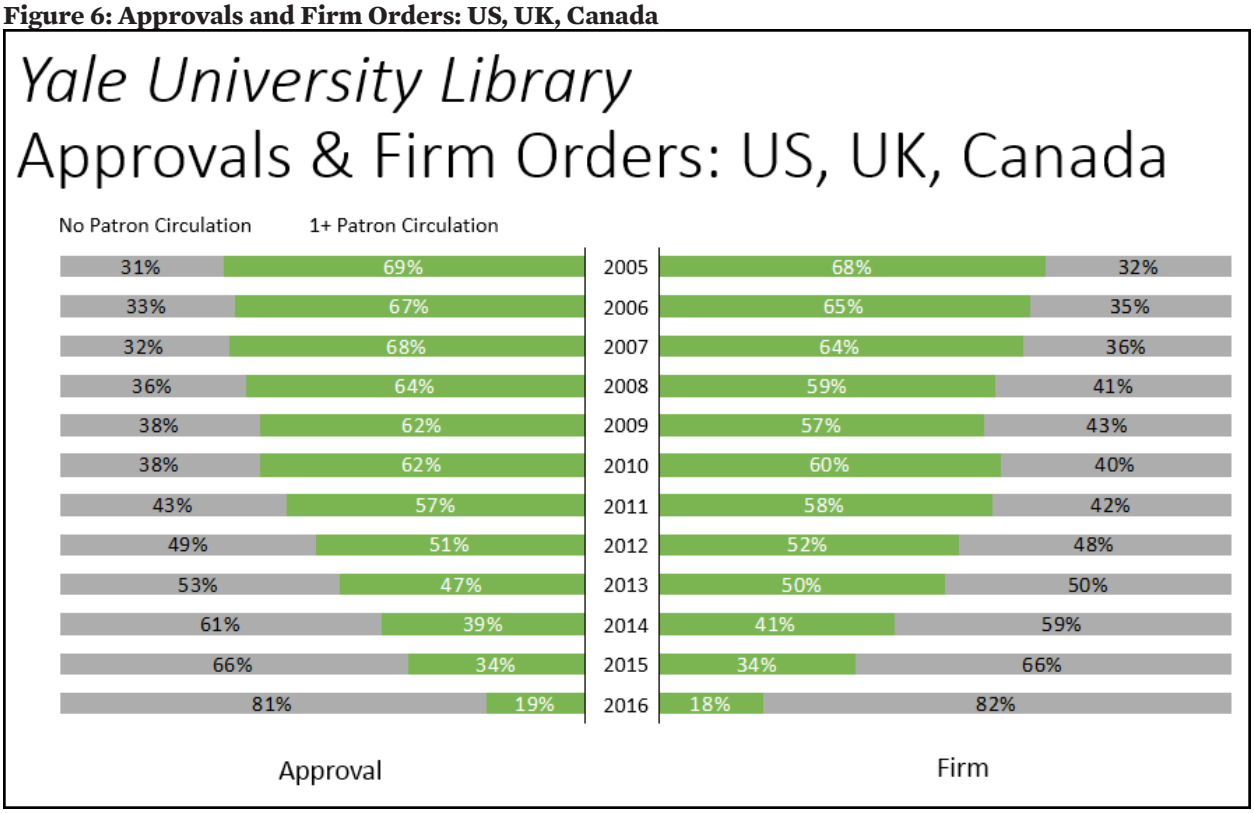
plan acquisitions program. This chart shows the circulation trends of books acquired from Western European vendors. While circulation is generally low—well under 50 percent—for both firm orders and approvals, it is clear that firm-ordered books consistently enjoy a higher circulation rate than approval books. The reasons for the difference are not explained by the data here, but can spark useful questions, such as: are the firm orders generated by patron requests (and therefore more likely to circulate immediately)?

Figure 5: Approvals and firm orders: Western Europe



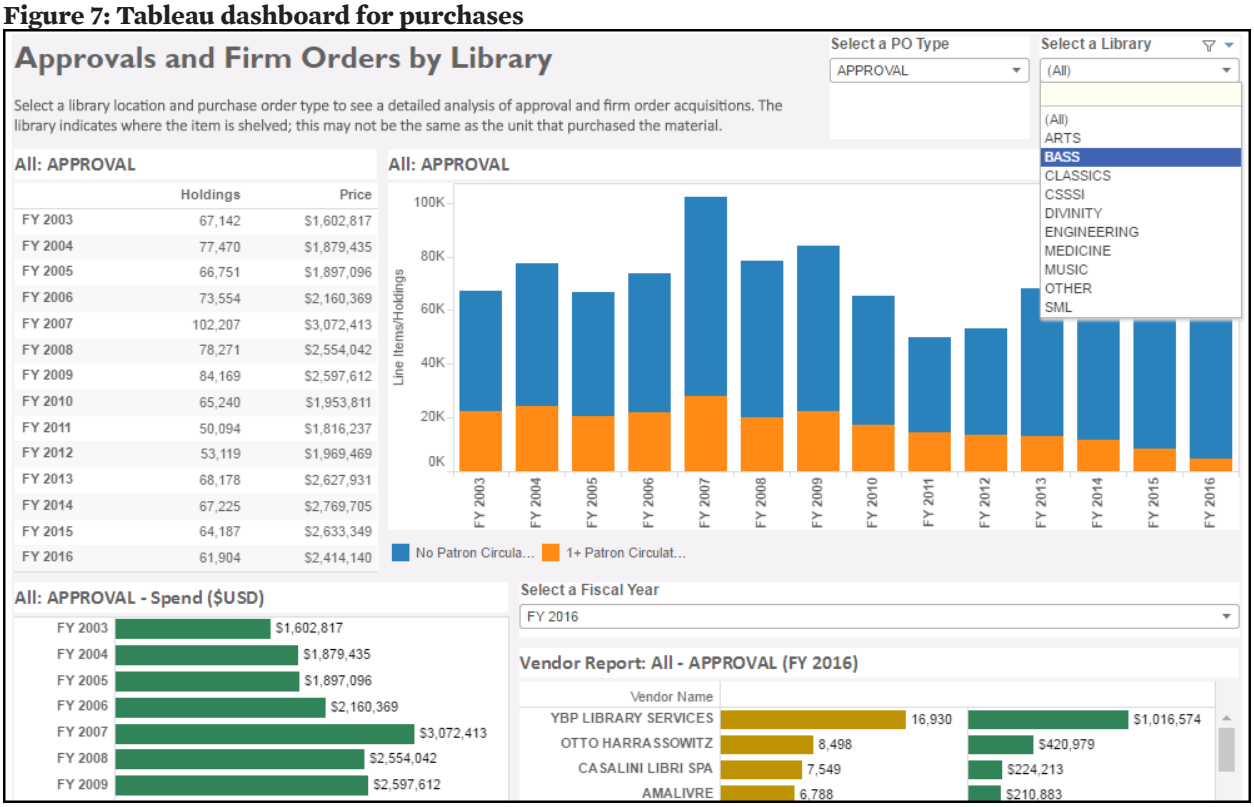
Approvals from US/UK and Canadian vendors show a different usage story. Nearly 70 percent of the material added to the collection via approval plan in 2005 has circulated. The butterfly chart shows near symmetry of circulation percentages of approval books and firm ordered books.

Figure 6: Approvals and Firm Orders: US, UK, Canada



Interactive Tableau dashboards allow collection development librarians to go beyond static visualizations to engage with the data. By developing interactive tools, the assessment librarian promotes a culture of assessment in which all librarians are expected to use data to inform decision making and to apply critical thinking to the data.

Figure 7: Tableau dashboard for purchases



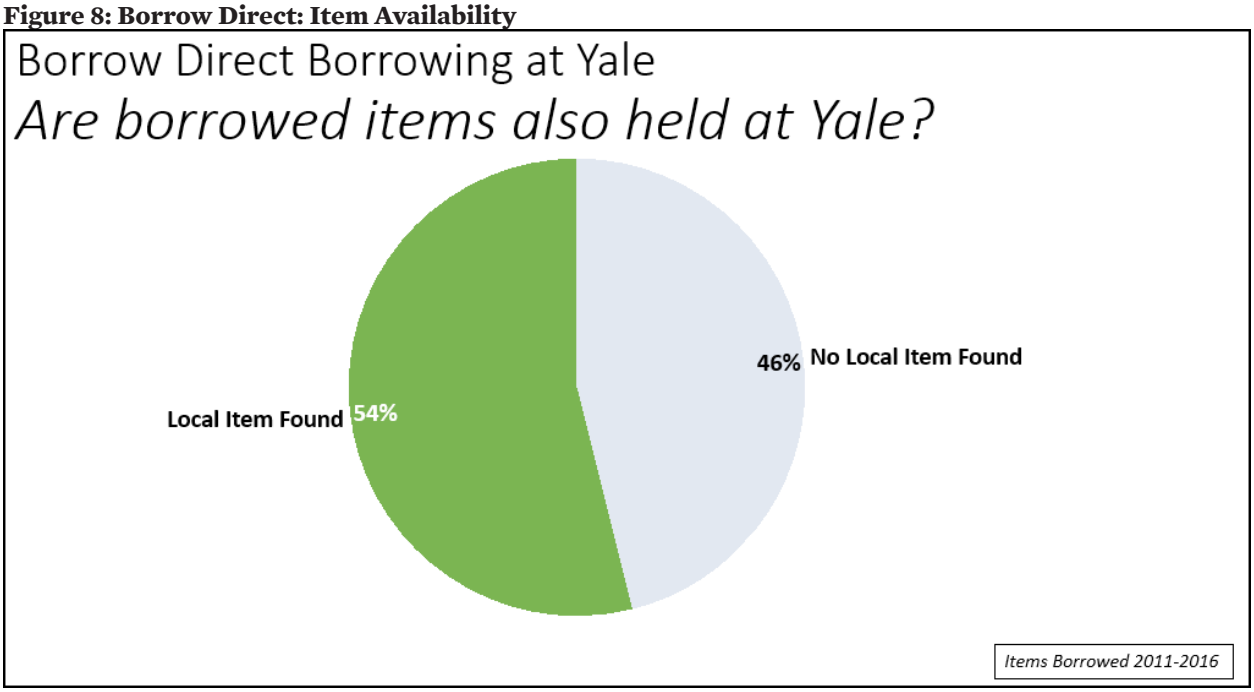
The dashboard shown here allows librarians to explore a variety of metrics in a compact and interactive presentation. Selection and filter options include purchase order type (approval or firm order), library (all or specific library), and fiscal year. When selections are made, the display refreshes to show holdings, expenditure, and vendor-specific data.

The rich dataset and the Tableau dashboards allow for deep and detailed assessment of approval plans. Yale Library is also assessing its approval plans in a broad context as the impetus for collaborative collections accelerates.

Yale Library's primary resource-sharing network is called Borrow Direct. It is a service of twelve "Ivy Plus" libraries.[7] Borrow Direct is popular with students and faculty because the turnaround time is fast and because users can request books that Yale holds if Yale's copies are missing or checked out.

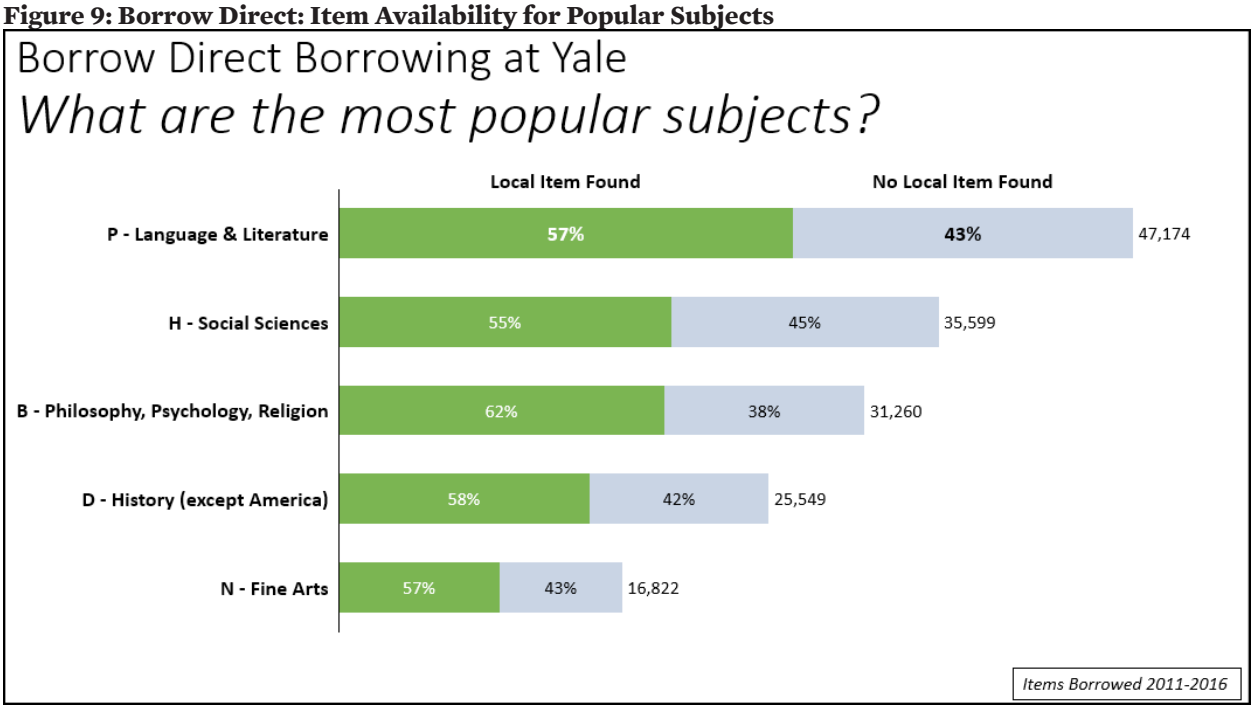
Indeed, the data show that more than half of Yale's use of Borrow Direct is to obtain copies of books already held at Yale; to put it another way, Borrow Direct is a "second copy" service.

Figure 8: Borrow Direct: Item Availability



That overall pattern holds true in broad subject areas. In literature, the social sciences, fine arts, and other subjects, more than half the books borrowed through Borrow Direct are also held at Yale.

Figure 9: Borrow Direct: Item Availability for Popular Subjects



Analysis of the 46 percent of borrowed materials not held at Yale can provide another lens on approval plan performance. For example, some of the books not held at Yale when they are borrowed through Borrow Direct are simply *not yet* at Yale—that is, another Ivy Plus library has received and cataloged the book sooner than Yale has.

As the Ivy Plus libraries work "toward fulfilling a vision of collection development and management that recognizes the partners' preeminent academic research and special collections as one great collection," Yale and the other Ivy Plus partners will want to understand overlap and divergence among their monograph collections, use of those collections locally and throughout the network, and how approval plans can be optimized to develop "collective collections."[8]

Further directions for assessing approval plans include:

- Analysis of patron purchase requests. Like circulation statistics, whether local or inter-institution, purchase requests are a direct expression of patron needs and expectations. Many patron requests are for very new books—in some cases, for books announced but not yet published. Rush requests take us out of our approval plan workflow into a more manual workflow. The effect of Amazon, not only as an enormous metadata source, but also in shaping expectations about rapid fulfillment, might be an environmental factor that pushes us to think differently about the role of approval plans in our collection development toolkit. Are there patterns in these requests that can inform approval plan modifications or adjustments to library workflows?
- Evaluation of the impact of e-preferred approval models. As Yale Library shifts some of its approval acquisitions to an e-preferred model, to what extent can the existing approval plan assessment model incorporate those materials, and what new or different metrics should be applied?
- Development of a predictive model for monograph circulation. Is it worth developing and testing models that would inform changes to approval plan profiles?
- Further analysis of the unique features of approval plans for foreign vendors. The approval plan assessment described here has focused on books and vendors in the United States, United Kingdom, Canada, and Western Europe. Do these models make sense for approval plans in other countries and regions, or for plans that are more tailored to a particular subject? What other metrics might be useful for such plans?

Endnotes

1. See for example Beau David Case, "Approval Plan Evaluation Studies: A Selected Annotated Bibliography, 1969–1996," *Against the Grain* 8 (1996): 18–24, doi:10.7771/2380-176X.2055.

2. See for example Jennifer Z. McClure, "Collection Assessment through WorldCat," *Collection Management* 34 (2009): 79–93, doi:10.1080/01462670902722213; Robert Alan, Tina E. Chrzastowski, Lisa German, and Lynn Wiley, "Approval Plan Profile Assessment in Two Large ARL Libraries: University of Illinois at Urbana-Champaign and Pennsylvania State University," *Library Resources & Technical Services* 54 (2010): 64–76, http://www.ala.org/alcts/sites/ala.org.alcts/files/content/resources/lrts/archive/54n2.pdf.

3. See for example Marcie Kingsley, "Circulation Statistics for Measuring Approval Plan Effectiveness," *Against the Grain* 8 (1996): 1, 16–17, doi:10.7771/2380-176X.2054; Denise Brush, "Circulation Analysis of an Engineering Monograph Approval Plan," *Collection Building* 26, (2007): 59–62, doi:10.1108/01604950710742095; James Cory Tucker, "Collection Assessment of Monograph Purchases at the University of Nevada, Las Vegas Libraries," *Collection Management* 34 (2009): 157–181, doi:10.1080/01462670902962959.

4. See for example Richard Entlich and Maureen Morris, "Tightening the Core: Using Circulation and Cost History to Reduce Spending on a Research Library's Central Approval Plan," in *Proceedings of the Charleston Library Conference* (2009), doi:10.5703/1288284314735.

5. See for example David C. Tyler, Christina Falci, Joyce C. Melvin, MaryLou Epp, and Anita M. Kreps, "Patron-Driven Acquisition and Circulation at an Academic Library: Interaction Effects and Circulation Performance of Print Books Acquired via Librarians' Orders, Approval Plans, and Patrons' Interlibrary Loan Requests," *Collection Management* 38 (2013): 3–32, doi:10.1080/01462679.2012.730494.

6. See for example J.P. Ladwig and Thurston D. Miller, "Are First-Circulation Patterns for Monographs in the Humanities Different from the Sciences?" *Library Collections,*

Acquisitions, and Technical Services 37, no. 3–4 (2013): 77–84, doi:10.1080/14649055.2013.10766352; Sheila Cheung, Terry Chung, Frederick Nesta, "Monograph Circulation over a 15-Year Period in a Liberal Arts University," *Library Management* 32 (2011) 419–434, doi:10.1108/01435121111158565.

7. As of this writing, the twelve Ivy Plus institutions that participate in Borrow Direct are: Cornell, Columbia, Harvard, Yale, University of Pennsylvania, Princeton, Brown, Dartmouth, Duke, Johns Hopkins, University of Chicago, and MIT. For an overview and history of the Borrow Direct service, see www.borrowdirect.org. Stanford has joined the Ivy Plus Libraries, but is not yet included in the Borrow Direct service.

8. "Ivy Plus Libraries Appoints Director of Collections Initiatives," press release, Yale University Library, July 15, 2016, http://web.library.yale.edu/news/2016/07/ivy-plus-libraries-appoints-director-collections-initiatives.

Mind the Gap: Using Patron Actions to Identify Holes in a Library's Collection

Qiana Johnson
Northwestern University, USA

Abstract

If you ask users about what collection resources they need for their research, often they seem to need access to everything. But is this a case of shooting for the moon or is there a demonstrable need for access to everything? Even if libraries wanted to, limited financial and space resources keep them from supplying every resource users may need. Libraries have done significant work to assess their collections based on the materials they have purchased or licensed. But how do libraries know what they do not have? Can the use of indirect observation methods determine users' most critical unmet collection needs? This lightning talk will discuss the pros and cons of various techniques for identifying unmet needs including interlibrary loan statistics, library catalog or discovery system searches, and turn-away statistics, among others.

Collection development is often a series of educated guesses about the research needs of faculty and students and the acquisitions of materials needed to support the curricular needs of the university. Libraries have a history of assessing the materials that have been purchased to determine if they are meeting the needs of their patrons. Less formalized work has been done to identify gaps in library collections. Libraries have examined requests for materials as well as anecdotal information from staff at service points about requested resources that were unavailable. Asking patrons about their resource needs through surveys or other techniques could lead to a large number of requests spread across a number of different subjects. But does that reflect actual research or curricular need—or more pie-in-the-sky dreaming? This paper outlines sources of information that can allow libraries to take advantage of user behavior to identify gaps in the collection.

Literature Review

The literature demonstrates a variety of techniques libraries have used to assess their services as well as their collections. One such method is examining responses placed into library suggestion boxes. Andrew K. Shenton outlined some of the advantages and disadvantages of gathering information through suggestion boxes. These disadvantages can range from ethical concerns of how the information will be used to what the suggestions are actually reflecting. He writes, "Furthermore, if suggestions do merely reflect dissatisfaction with the library, the ideas contributed may well be as much expressions of wants as actual needs, although, as Shenton and Dixon note, LIS commentators have for years debated the precise differences between the two concepts."[1] In their article, Cecile M. Farnum, Catherine Baird, and Kathryn Ball discussed some of the benefits of suggestion boxes as an assessment tool, including, "Since most libraries already have a suggestion box in place, it can be a low cost method of gathering user feedback. Surveys, by comparison, can be very expensive to administer."[2] They later identified the primary conditions under which the data gathered from library suggestion boxes would be used:

- Libraries are more likely to use the suggestion box as a gauge of user satisfaction and in decision making if the suggestion box is on their homepage.
- Libraries are more likely to use their suggestion box as a gauge of user satisfaction and in decision making if they post suggestion responses publicly.
- If more than one person is involved in responding to suggestions, the suggestion box is more likely to be used in decision making.[3]

Suggestion boxes have been demonstrated to be a low-cost tool for gathering user feedback. However, the feedback has most often been about services or facilities.

Libraries have frequently examined use of the collection to gauge how well it is serving its user population. George S. Bonn detailed a number of techniques libraries could use to evaluate their collections, including compiling statistics, checking lists, catalogs, and bibliographies, obtaining user

opinions, direct observation, and applying standards. Some of the statistics Bonn mentions reflect observations of user behavior—interlibrary loan requests and circulation.[4] Paul Metz and Charles A. Litchfield noted the number of use studies that had been generated in the library literature while also noting the difficulty in generating generalizable conclusions from the studies. In order to try to address the need for more generalizable information, they studied the use of materials by subject at the Virginia Tech Library. In the study, they hoped to answer the questions:

1. How do various kinds of use differ at the subject level? Specifically, how similar are in-library use and circulation patterns? How different is the use of current periodicals from other use?
2. How stable are circulation patterns, by subject, across a time period as long as five years?
3. How large a sample is the minimum size required to yield reliable estimates of use?
4. To what extent do differences in library holdings across subjects artificially affect the correlations among use measures differing in kinds of use measured, technique or measurement, or time period?[5]

Another use-based study was Karen C. Kohn's study focusing on the library's support of parts of the undergraduate curriculum. For this study, use was based on circulation. By assigning a call number range to a selection of undergraduate courses, Kohn examined the number of books the library owned in those particular ranges and circulation data about those ranges. After analyzing the data, she found a small number of courses for which the library had no materials supporting them. The majority of the courses, however, had an average of 175.15 books supporting them.[6] The information was not gathered with an eye to assessment, but "rather to enable our collection development activities to become better informed."[7] Like many other studies, collection information has often been gathered to learn about the collections themselves. Other usage studies have looked at particular parts of a library collection and measure use through different methods. Jane Kessler studied use of reference materials over the course of a fall semester. Use in this case was determined by the number of times an item was re-shelved. Unlike circulation statistics, re-shelving statistics are not able to capture multiple uses of an item before it is re-shelved.[8]

Another technique libraries have used in collection development has been citation analysis. In her paper, Linda C. Smith discusses the development of citation analysis and possible uses in libraries. She later goes on to discuss critiques of citation analysis ranging from the assumption that "citation of a document implies use of that document by the citing author"[9] to "all citations are equal."[10] Even with these critiques, she describes some uses of citation analysis, including collection development, primarily for journal collections.[11] Citation analysis has been used for collection development in particular subjects or looking at library support of particular types of students. Sherri Edwards used citation analysis to examine the University of Akron's polymer science collection, using it to gauge title dispersion, format of materials cited, and cost effectiveness of journals.[12] Reba Leiding examined the bibliographies of upper-level undergraduate papers to assess the library collection at James Madison University. She examined the types of sources cited over time and their availability at the library.[13]

Interlibrary loan borrowing statistics is another tool libraries have used to evaluate their collections. Gary D. Byrd, D. A. Thomas, and Katherine E. Hughes compared book acquisitions to interlibrary loan requests at three health sciences/medical libraries to examine if this information could be used to assess collection balance.[14] William Aguilar developed a ratio of library holdings to circulation and a ratio of library interlibrary loan borrowings and library holdings. With these ratios, he posits four rules about a library's collection and how a library might respond. Those responses range from purchasing additional materials to support a subject to determining if a subject is a "dead" subject and materials in this area should no longer be purchased.[15] More recent articles have been examinations of the use of circulation and interlibrary loan statistics by subject[16] and articles examining circulation and ILL data to assess how well library collections are filling user needs.[17]

Techniques for Identifying Collection Gaps

While much of the literature has addressed the various methods that can be used to assess materials that have already been acquired by the library, there has not been as much specifically written about identifying gaps in the collections. With a slight change in focus, many of the techniques used to evaluate an existing collection can be used to identify gaps. One such technique is looking at library catalog or discovery services search logs. One way libraries

can use these logs is by examining searches that revealed no results. These searches show resources that patrons were trying to access that the library did not have access to. Libraries may not want to acquire materials that were only searched for one or two times; however, titles that continue to come up may warrant examination by collection development librarians. Another technique that could be used with catalog search logs is a textual analysis of subject or keyword searches that produce few results. These searches could represent areas of new curricular or research interest at the university that have not been brought to the attention of the library. While catalog or discovery service logs can be useful for identifying holes in the collection, there are some caveats to keep in mind. Some of the zero result searches may be typos. Other zero or low-number result searches may indicate a misunderstanding of how the system can be searched as well as the types of materials that can be located through it. These searches may indicate more of a need for increased user instruction than a need for additional library materials.

Libraries have often used usage statistics for their electronic resources as a metric for determining whether or not to continue subscribing to a resource. These usage numbers, combined with other data sources, can give libraries the opportunity to identify changing needs. By examining usage numbers over years, libraries can see when minor fluctuations in use become marked decreases in use. This decrease can signal to the library that a closer look needs to be done at this resource. Marked decrease in circulation of materials in a particular subject is also a tool that can be used to identify parts of the collection that need to be examined more closely. Decreases in use of an electronic resource or decrease in a library's collection in a particular subject might say more about the particular resources themselves. However, by looking at this information together, libraries can get a picture of changes in research and curricular focus. Does a decrease in the use of a subject-specific electronic resource combined with a decrease in circulation of print materials reflect a decrease in the number of patrons these materials are supporting? Has the focus of research in this area changed such that materials libraries are currently collecting no longer meet the current research needs? While examining decreases in materials use will not provide libraries with a list of new titles to acquire or define new research areas of interest, it can identify parts of the collection where the library may want to take a closer look for possible adjustments to the collection strategy. Some things to keep in mind with examining usage numbers, particularly electronic resource usage numbers, are that a complete stoppage of use may reflect an access issue. If patrons are not able to access a resource, that will correspond with a lack of use. However, if access has been lost for several months and the library was not made aware of it, collection development staff may want to examine if there is a desire for this resource. Also, curricular requirements in a program may change and require less research from the students. These changes can manifest themselves in a decrease in usage of both print and electronic resources.

A related technique to examining usage numbers is citation analysis. Libraries can examine the materials cited in the bibliographies of faculty research, dissertations and theses, and undergraduate honors papers. Libraries have frequently used this information to gauge how well the library has supported student and faculty research by the number of materials cited that are owned or accessible through the library. By looking at materials that were not owned or licensed by the library, collection development staff can identify trends in frequently used titles or subject areas where the library's collection is not able to fully support the community's research needs. By looking at where faculty are publishing their research and determining if the library has an active subscription or license to the content, libraries can identify titles that they may want to add subscriptions to. By adding these subscriptions, the library provides access to faculty members who may want to study a journal before deciding to publish there. Subscribing to the journals where faculty frequently publish also makes sure that the library is preserving the scholarly output of their faculty. In order for this information to be most useful, citations will need to be analyzed for an extended period of time in order to determine if a resource was used for a single, specialized research project or if there is more widespread need for the resource.

Another source of information about gaps in the collections is interlibrary loan statistics. While ILL statistics have been used to look at the balance of a library's collection or how well it is supporting user needs, these analyses are reflective. By looking a bit closer at what is being requested, libraries can react to this information and identify materials that might be valuable to add to the collection. Interlibrary loan requests are concrete examples of materials that users wanted to access that the library did not

have. As with searches in the catalog or the discovery system, requests for materials through interlibrary loan that receive a small number of requests most likely reflect that patrons are being well-served by the materials that the library is collecting. Items, however, that have a large number of requests reflect a continuing need that the library is not serving. Unlike selecting materials in a subject hoping that they will fit the curricular and research needs of the patrons, with interlibrary loan requests, the library has a strong indicator that these materials are needed and wanted. While interlibrary loans can be particularly valuable for filling in collection holes on a title-by-title basis, subject analysis of materials that have been requested can help libraries identify areas where there is a need to increase focus. After examining the subjects of materials frequently requested through interlibrary loan, libraries can determine if the requests are for materials in a new area of research within the university. Are the requests in a growing subfield of a subject that the library currently collects in? In addition to gathering information about the subjects for materials being collected, information about who is producing that information can also be helpful. Are interlibrary loan requests coming in for subjects where the library is already strongly invested? If they are, are the requested materials clustered around particular publishers? Taking this information, libraries can make adjustments to their approval plans to include materials from these publishers, or collection development librarians can add analysis of these publishers into their title-by-title decisions. Examining both frequently requested titles and frequently requested subjects can give libraries a place to start in looking at how and why things might have been missed in other collection development efforts. Title and subject information gives the library targeted places to look at current collection development strategies in order to make adjustments.

Interlibrary loan statistics can be useful to libraries in filling collection gaps, but they should be used with care. If possible, libraries should try to determine if the requests reflect a short-term need. Were the materials requested for a class that will only be offered once? Were the materials supporting a visiting scholar? While it is important to understand if requests are being born of a short-term need, respecting patron privacy is also important. While interlibrary loan requests are beneficial for identifying patron needs, they will only reflect the needs of patrons who were willing to expend the effort to place the request. ILL stats will not give a picture of the material needs of those who opted not to use or did not know about the service.

Another useful gauge of patron need is turn-away statistics. By examining the journal titles that patrons tried to access, libraries can get a picture of resources that patrons might have wanted to access. Again, by looking at these statistics over time, libraries can begin to gauge the possible need to add subscriptions to these journals. While these statistics can be useful for identifying materials patrons had wanted to access, examining these statistics over time will be most useful to identify continuing needs as opposed to a short-term need that might be best met by interlibrary loans. Another question that collection development librarians will want to keep in mind is whether or not the attempt at access represents a “real” need or more of a curiosity because an article came up as a related article. Also, like with stoppages of usage, turn-away statistics may reflect content access issues. Sometimes access to resources can be accidently turned off and patron need for the resource is reflected in turn-away statistics. However, presence of turn-away statistics for materials the library should have had access to can be used to demonstrate continued patron need for the resource. Patron use of books through patron-driven acquisitions (PDA) can also be helpful for identifying holes in a collection. Collection development librarians can examine materials selected by subject, publisher, or other methods. The library can then work to determine if these types of materials would have come into the library through other methods such as the approval plans or through title-by-title selection. While PDA may be supplementing the materials that are already coming in, they may be materials that the library would have not known to collect. PDA gives patrons the opportunity to vote with their feet as it were.

As noted in many of the techniques possible for identifying gaps in the collection, many of them require the use of statistics over a number of years in order to identify long-term needs. Looking at the variety of sources for information about holes in the library’s collection, library staff will need to develop ways to prioritize which holes to fill. Will the library focus on filling holes in collections supporting larger departments? Or will the library focus on departments that are growing? Another strategy would be to focus on holes in collections supporting newer departments. Or the library can focus on disciplines or areas of focus in the university’s

strategic plan. These are just a few of the areas libraries could use to determine where to start. And once an area or two has been decided upon, many of these techniques, such as changes in usage patterns or examining interlibrary loan statistics, may benefit from conversations with patrons served by these collections. The identification of gaps can provide a conversation starter with patrons.

But some may be asking, is the effort to identify these holes worth it? Using these varied techniques can be labor intensive and often are only useful over the long term. Individually, libraries will never be able to meet every need. Wouldn't it be better to rely on interlibrary loans to meet those needs that the library collection budget does not? And even if libraries identify collection needs that they would like to fill, will there be funding in order to do that? This is where having a plan to prioritize which collection gaps the library would like to fill can be beneficial. If the library is able to identify collection gaps that, by filling them, would support university goals, a stronger case can be made for requests for additional funding. Or could libraries use information about decreasing use of particular parts of the collection to redeploy those financial resources to newer areas of research and curricular interest? With the various collection management statistics available—interlibrary loan statistics, electronic resource usage statistics, circulation statistics, and others—libraries can gauge how well the collection is meeting users' needs and identify collection gaps in an effort to put collection dollars where they are more needed. The use of these statistics combined with partnerships through library consortia for services such as reciprocal borrowing and interlibrary loan allow libraries to extend the resources they are able to offer to their patrons.

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Developing a Sustainable Collection Assessment Strategy

Michelle Leonard and Steven Carrico, Emeritus
University of Florida, USA

I. The Need for a Collection Assessment Strategy

Assessing collections is becoming increasingly important to academic libraries. Most college and university libraries spend a significant portion of their funds on online resources, often to license large journal packages and databases. In addition to online resources purchased independently, libraries provide e-books and other resources acquired from local consortial memberships, larger national consortia such as the Center for Research Libraries, and with partnerships such as HathiTrust. Another growing trend among academic institutions is for the libraries to acquire and offer users a wide range of online items made available from the Open Access (OA) and Open Educational Resources (OER) initiatives. By acquiring and making available to users a veritable glut of online resources that often are interdisciplinary, multidisciplinary, and in some cases transdisciplinary, academic libraries are stretching the parameters of what was once considered traditional collection building. This creates a challenge for librarians in large academic libraries as they define and assess the holdings or resources offered for a specific subject discipline (e.g., astronomy). Librarians must also wrestle with how to assess the cost benefits of a subject collection when often a large percentage of the library's material budget is used to purchase large journal packages and databases that support multiple subject collections. Thus, it is imperative for academic libraries to develop sustainable and comprehensive strategies for assessing collections of all sizes and subject areas, particularly as many libraries are dealing with restrictive material and resource budgets. The results of collection assessment studies can provide evidence to improve budget allocations, revise collecting policies, and develop more appropriate acquisitions priorities.

To meet this goal, the authors launched an assessment project to review one large subject collection located within the University of Florida's Marston Science Library. To simplify the process and make assessing a collection a more organized, standardized, and sustainable methodology, a step-by-step checklist was created by librarians at the University of Florida (UF). Part of the project also included performing a survey of faculty and graduate students from UF's Marston Science Library and Health Science Center Libraries. The findings to date of the pilot as well as the survey are included in this paper.

II. The Collection Assessment Project

The authors devised a collection assessment strategy and created a simplified "Checklist to Assess a Collection" as a guide to keep the project organized and on track. The checklist contains six phases, with each phase containing a varying number of steps to analyze in detail a collection and users (Appendix 1). One of the authors is a collection manager of multiple subject areas within the science library, including the multidisciplinary subject area of natural resources. Natural resources in this context includes incorporating sections of agriculture, ecology, fisheries (which is in the UF Department of Forestry), environmental sciences/policies, and the UF School of Natural Resources and Environment (Table 1). The subject area of natural resources was selected as an example for the project as it encompasses many call number ranges and subject headings. Gathering and analyzing data such as journal, database, or e-book usage for such a broad subject area can be very problematic.

Phase 1

Phase 1, "Identify users and user needs for subject areas," focuses on the user base (i.e., clientele served) that the collection supports. A broad and interdisciplinary subject area such as natural resources obviously supports many users from various departments and colleges at UF. It is not by accident the first phase of assessment begins with the user base, as the primary goal of collection development at UF is to serve its users. By keeping track of the number of faculty, researchers, and students—and monitoring their instructional and

research needs—an academic library can update or create relevant collection policies and more accurately distribute the materials budget across multiple subject areas.

Phase 2

Phase 2, "Define collection and budget profiles," comprises steps designed for librarians and collection staff to employ when delineating both the numeric count of tangible items held in a specific collection or subject area and the number of online resources being acquired to support the collection's primary user base. This phase includes steps for listing material budgets, research grants, and endowments allocated to support the collection. To assist in this phase of the project, a "Collection Profile and Resource Support Template" was constructed by the authors as a centralized place to keep the data as it is being collected (Appendix 2). The template was used to record and highlight many of the descriptive, numeric, and budgetary components of the natural resources collection. Although rather difficult to identify and gather, the template includes space to record the number of online resources received from large multidisciplinary journal packages databases, memberships, consortial deals, or acquired via Open Access.

During this phase, statistical information was gathered for both the physical and online resources supporting the natural resources collection. This data is the base for much of the qualitative assessment undertaken, with analysis performed using usage and circulation data pulled from vendor and the library's integrated library system (Ex Libris Aleph) reports. It should be noted that reports generated on the size of a collection and its holdings are separate from reports generated on costs or usage often provided by a library's Acquisitions Department or e-resources librarian. In many libraries, gathering numeric and cost information will require report generation from more than one area of operation.

Phase 3

Phase 3, "Conduct quantitative analysis," contains three steps for the quantitative analysis of a collection. In this phase, a collection manager will need to incorporate data from circulation studies for print and other tangible items held in the collection, cost figures for all resources spent on the collection, and usage statistics for online resources whether purchased or received from Open Access sources. As it can be rather labor intensive for library staff to gather usage and cost figures for a specific subject area or collection, it is advisable to request usage and cost reports from vendors whenever possible. Fortunately, many vendors and publishers do provide a variety of reports that compile usage and costs for the online resources provided to libraries. Due to limits found in prebuilt vendor reports, often the collection librarian or library staff must compile and sort the data to determine intricate cost per use and other detailed metrics for a targeted subject discipline or broad subject area.

The value in conducting usage and cost analyses is twofold: one, usage can show the value of a collection to stakeholders—for example, if the print or e-books in a subject area show high usage, the cost to purchase or license the content is easier to justify. Two, only by doing cost and usage evaluation can a library determine if the material budgets are being allocated correctly. Cost per use evaluations can be conducted by dividing the overall or specific title usage by the cost of the resource(s). It is also necessary to incorporate the cost figures for resources received in large journal packages and databases that serve multiple disciplines. Publishers can supply cost and usage figures for each title in a package, so it is possible, if sometimes labor intensive, to determine subject disciplines served by journals using subject designations or call number ranges. Subjects supported by various databases can also be tricky, since statistics vary from vendor to vendor and subject areas are often defined in broad scopes (e.g., engineering), not necessarily by specific subject disciplines (e.g., mechanical engineering). In these cases, it is best to designate the resource as "multidisciplinary" and make a narrative note of its importance to the subject collection.

Phase 4

Phase 4, "Conduct qualitative analysis," has only two steps, yet the importance of this phase cannot be overstated. While quantitative reports are derived from usage, circulation, title counts, and other numeric-based metrics, qualitative assessment takes the form of surveys, interviews, and user studies with the aim to gather user and usability feedback. During the assessment project, the authors conducted a qualitative survey[1] to determine how faculty, researchers, and graduate students access the science collection and the online resources being offered by the library. The 14-question survey included five questions focusing on the importance

of OA/ER in their disciplinary fields. The survey was created and made accessible to respondents for three months using the software Qualtrics. E-mail messages with links to the survey were distributed by the science librarian collection managers to their respective departments, although the authors cannot confirm how many departments or respondents received the e-mail solicitation.

The survey was begun by 68 users, but not all finished. A clear majority of respondents, 67% (n=42), came from UF faculty. To the question "How do you incorporate information from library resources in your research/scholarly activities? (select all that apply)," an overwhelming percentage of users selected the options "publishing in journals or books" (93%; n=51) or "grant activities" (82%; n=45), which is understandable as UF is a tenure-accruing institution and the science departments place a premium on grant writing for faculty. To the question "How do you incorporate library resources into instruction? (select all that apply)," both "class assignments" (60%; n=32) and "e-learning system" (59%; n=31) were by far the two most popular responses. This is also understandable, as the science libraries' course reserves system is heavily used by faculty and students. Three free text questions asked the users to provide feedback on the essential resources in their work. The first asked users to list the "most important journals provided by the libraries," the second asked them to list the "most important databases provided by the libraries," and the third asked them to list the "most important resources you would like to see the libraries provide." All three questions received a wide variety of responses but also many overlapping cited resources, both for what the libraries are providing and what the libraries are not providing. This information might be highly valuable to science librarians during selection or deselection projects and in selecting priorities for acquisitions.

The last five questions centered on obtaining feedback on resources being used that are acquired through Open Access (OA) and Open Educational Resources (OER). To the question "Do you use library provided OA/OER resources?" 51% of the respondents said no (n=23) and 49% said yes (n=22). Based on a 2015 study on usage statistics from OA resources being offered by the University of Florida Smathers Libraries (434,215 uses), one might conclude that the faculty and graduate students who do use open resources provided by the libraries use them repeatedly. The importance placed on open resources for some users of the collections is also apparent in the responses to the question "How important are OA/OER resources to your work or field of study?" Exactly 80% of the respondents either selected "extremely important" (20%; n=4) or "very important" (60%; n=12). Although the small number of responses to the OA/OER questions, or to the survey in general, does not provide sufficient sample size for scientific validity, the survey did provide useful information from users on how the collection is used and what resources are most valued.

Phase 5

Phase 5, "Revise parameters/fund management," is comprised of steps to revise collection-building efforts using the results of the first four phases. Therefore, Phase 5 is the practical and direct application of the collection profile review and assessment studies. It is anticipated the information and feedback garnered from the assessment project will provide more evidence in hand to assist the Marston science librarians as they address budget allocations and set resource priorities in the next fiscal year.

Phase 6

Phase 6, "Communicate to stakeholders," is a crucial element to any effective assessment strategy. An essential duty for collection librarians is to communicate information and results from assessment studies to stakeholders. There are many benefits to be gained by reaching out to stakeholders, particularly to the users themselves. Sharing survey results with users will encourage users to participate in future qualitative studies; and by reaching out to faculty, students, and researchers with information from assessment efforts, it can provide opportunities to discuss collection objectives, resource prioritization, and budgeting for a specific subject area.

To be an effective communicator requires that you know your audience and tailor what is presented accordingly; the presentation a librarian gives to faculty or students may differ in content and style to what is provided to administrators. It can be helpful to think of the presentation of assessment results as a story, and every successful story has these basic three components:

1. Be accurate and use evidence to tell the story of what happened, how it happened, why it happened, and what happens next.

2. Be clear in your message and determine how much evidence is enough.
3. Be concise and stay on message.

For academic librarians, it is likely that there will be three main audiences towards whom to target your presentation: library colleagues, library administrators, and institution administrators. When communicating with colleagues, it is permissible to provide lots of information and less background with a focus on more time for new information and what it means—putting content into context. When communicating with library administrators, it is recommended to use more story and data with explanations of key points and comparisons to collections at peer institutions. When communicating with institution administrators, it is best to provide a simpler story or overview and create a scaffold for more advanced understanding. Often it is advantageous to include comparisons to similar institutions, but note that institution administrators may have a different list of peer institutions than library administrators. And never include raw data in a presentation; create summarized tables, graphs, and figures for exactly the point being made and highlight only what the audience really needs to see. Many administrators only want to know how assessment findings are relevant and how the information gathered on a specific collection will benefit the institution or users. Constructing a compelling assessment story will hopefully gather support from all stakeholders.

III. Conclusion

The collection assessment project described in this paper was beneficial for many reasons. The first was the development of the "Checklist to Assess a Collection" as a simplified method to track and keep an assessment project on target. Second was the creation of the "Collection Profile and Resource Support Template," which offers collection managers a one-page method for recording cost and metrics, summarizing the physical and virtual attributes of the collection, and documenting the primary user base for the collection. Once filled out, the template can easily be shared with stakeholders, and for collection managers who spend only a portion of their annual assignments on collection building and assessment activities, the checklist and templates are especially helpful guides for a project that might take several weeks to complete.

Another value to performing a comprehensive assessment of a subject collection was the qualitative survey the authors conducted with library users. Useful information was gathered from the survey that has provided additional insight on users' preferences and views of the collection. While it is true that survey responses are subjective and not scientific by nature, qualitative results are meaningful to an assessment project. Supporting the users is a core mission of most library collections; thus, it is vital for librarians to conduct qualitative research and apply the feedback to improve the collection and the resources being offered users.

A final benefit gained from conducting this project is a better understanding of what is required in developing an effective collection assessment strategy. For an assessment strategy to be successful, it must be sustainable and comparable from one year to the next. The strategy should not be overly complicated to perform for collection librarians and staff, despite the fact that report generation and data sorting can be labor intensive. The methodology for gathering holdings and resource counts, cost and usage, and other data should be documented and repeatable, so specific subject collections or broad subject areas can be analyzed and compared across the library (STEM vs. humanities). In addition, a comprehensive collection assessment strategy should incorporate both quantitative and qualitative assessment strategies. Finally, an effective strategy needs to incorporate a phase for communicating information gathered during the assessment project. Assessment results should be presented in succinct, informative, and understandable ways to administrators, librarians, and other stakeholders.

For the authors, developing a checklist and template to use as project guides for collection assessment provided a methodology that will ensure an annual collection review and assessment is replicated across libraries for multiple disciplines. The results from annual assessment reviews will then become comparable and meaningful, and provide a sustainable assessment strategy to improve collection building and budgeting in the future.

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Table 1. Natural resources call number ranges based on CM liaison responsibilities

LC Range	Subject
GB 651-2998	Hydrology/Water Resources
GC-GE	Oceanography/Environmental Sciences/ Human Ecology
HC	Environmental Policy
QE	Geology
QL 386-394, 461-599	Entomology & Nematology
S	General Agriculture
S 590-599	Soil Sciences
SD	Forestry
SH	Fisheries
*excludes engineering	

Appendix 1. Checklist to Assess a Collection		
Phase 1	**Identify users and user needs for subject area**	
	a) College/department to support	☐
	b) Number of faculty	☐
	c) Number and type of students	☐
	d) Number and type of researchers	☐
Phase 2	**Define collection and budget profiles**	
	a) Summary statement/collection goals	☐
	b) Call number ranges/related subject areas	☐
	c) Budgets for monos/serials/other resources	☐
	d) Number of monos/serials/other resources	☐
	e) Resources received annually via:	☐
	i. Multidisciplinary packages and databases	☐
	ii. Open access/OER	☐
	iii. Memberships (e.g., HathiTrust)	☐
Phase 3	**Conduct quantitative analysis**	
	a) Circulation and usage stats	☐
	c) Cost-effectiveness studies (e.g., cost per use)	☐
	d) Open access/OER usage	☐
Phase 4	**Conduct qualitative analysis**	
	a) User surveys/interviews	☐
	c) Use studies	☐
Phase 5	**Revise parameters/fund management**	
	a) Set new objectives/reallocate budgets	☐
	c) Revise approval plan/dda profiles	☐
	e) Prioritize databases/resources and wishlists	☐

Phase 6	**Communicate to stakeholders**	
	a) Know your audience—tailor the message	
	i. Library colleagues	☐
	ii. College/university faculty and deans	☐
	iii. Students	☐

Appendix 2. Collection Profile & Resource Support Template

Subject Discipline:
Selector Liaison/Curator:
Fiscal Year:

Budget Center
Location/Branch:
Manager/Chair:

Funds managed or co-managed
Fund name(s):
Total allocation: $

Endowments:

Description of collection
Call number range(s):
Holdings Location(s):
Scope/Depth/Collection Level:
Languages:
Imprint years in holdings (print and online versions)
Percentage of print vs. online (monographs and journals)
Related subjects/interdisciplinary areas:
Approval plan and/or blanket orders:
Standing orders:
Just in Time/Use-Driven Acquisition plans: Type_____ Formats_____
Strengths/Weakness of collection:
Peer libraries/collection peers:
Grant activity:

Resources acquired through purchases
Number of print monographs:
Number of print serials (subscriptions) received:
Number of media (DVDs, music scores, mforms, etc.):
Number of e-books:
Number of online journals received through subscription or large packages:
Number of online journals received through memberships:
Number of databases:
Number of streaming videos:
Other:

Resources acquired through Open Access (include OER)
Number of e-books:
Number of online journals:
Other:

Number of online journals received through memberships
Number of databases:
Number of streaming videos:
Other:

Resources acquired through Open Access (include OER)
Number of e-books:
Number of online journals:
Other:

Applying the Principles of Total Library Assessment to Inform Sustainable Collection Development

Michael Luther and Ana Guimarães
Kennesaw State University Library System, USA

Abstract

In 2015, the assessment librarian and director of collection development at Kennesaw State University Library System collaborated on a pilot project to assess the print holdings of the collection. The project was designed to roll out over five years, during which time the project coordinators, with support from library liaisons and other essential personnel, would evaluate all monographic collections of the library system. During the pilot year, project participants assessed four ranges of call numbers associated with the anthropology, information systems, interdisciplinary studies, and sociology subject areas. These four subject areas served as a manageable test bed to evaluate the efficacy of this approach. The project was an attempt to apply principles spelled out in a 2016 journal article: "Total Library Assessment."

Introduction

Collection assessment and collection management are two sides of the same coin. Librarians select some materials and withdraw others, but based on what information? Should one use a single metric of value—circulation, for example—or a survey to gauge user satisfaction? Or, recognizing that any single metric can be reductive, even misleading, is it more appropriate to assemble a variety of data to deepen collection knowledge and foster wiser decision making?

Over a one-year period, the assessment librarian and director of collection development at the Kennesaw State University Library System (KSULS) collaborated on a pilot project to assess the print holdings of the collection. In cooperation with colleagues, the project coordinators assembled and organized diverse data from around the organization and presented it to four participating members of the Undergraduate Faculty Liaison Program. These liaisons represented the anthropology, information systems, interdisciplinary studies, and sociology subject areas. The Library of Congress Classification System was mapped to KSU subject areas (for example, sociology was mapped to H, HM-HT, and HX). Participating liaisons completed reports that analyzed relevant data and recommended a future course of action for the collection. In future years, the project coordinators hope to incorporate a weeding phase in which liaisons use the gathered information to recommend a list of titles for withdrawal.

This project was an attempt to apply principles and methods spelled out in "Total Library Assessment" (TLA), a 2016 article published in the *Journal of Library Administration*. Libraries are complex organizations, consisting of diverse functions. Any claim to have assessed a library must in some way account for this complexity. To do otherwise is akin to going to the doctor for a physical, having your blood pressure checked, and being issued a clean bill of health (or not) on the basis of the results. A thorough investigation of a collection requires multiple tools and multiple research methods. It also requires an understanding that library assessment as commonly practiced seeks answers to a fairly short list of fundamental questions.

Background

Prior to 2013, a collection assessment project of this scale and complexity would not have been possible. For one, there was no assessment librarian to dedicate the required time, thought, and energy to such a large and complex endeavor. Secondly, there was no collection development program as such. There were able librarians who selected materials, but the hiring of a full-time collection development librarian allowed the structure, organization, and functional cohesion that would eventually make comprehensive collection assessment possible.

The year 2013 also saw the creation of a library liaison program. In addition to departmental outreach and specialized reference and instructional services, liaisons are responsible for monographic selection within assigned subject areas. Well-

defined roles for assessment and collection development in combination with a liaison program provided necessary infrastructure to conduct collection assessment.

KSU's monographic collection is small in comparison to universities of its size, consisting of approximately 416,838 volumes. Yet even this modest collection must compete with other priorities, namely, seating. Current enrollment is about 35,000 students, placing KSU in the top 50 public institutions in the nation.[1] Enrollment encountered a large surge during the 2014–15 academic year, when KSU consolidated with the former Southern Polytechnic State University, bringing 6,200 new students and over 118,528 new volumes to the university.

Relevant Literature

"Total Library Assessment" posits that every assessment consists at minimum of a target, a question, and a method. The target could be something fairly small like the online chat service, or something large and complex in its own right like the collections of the library. For any given target, an assessment librarian may pose one or more questions relating to its use, the manner of use, how it is perceived, how it compares to peer libraries, if it is cost-effective, if it is efficient, and if it is having impact. Though this list is probably incomplete, it covers the bulk of the questions that assessment librarians regularly ask. Some questions are simple to answer and some are difficult, but it is important to understand that a convincing answer to one question makes no compelling statement about the other questions. Circulation (usage) could be going up while satisfaction with the collection (perception) is going down. Or perhaps both circulation and satisfaction are going up but there is no evidence of appreciable impact. Conversely, compelling evidence about the impact of your collection makes no statement as to its use or the ways in which it is used. All of this is to say that the questions are independent. After target and question, the final piece is method. A method is simply the means of asking a question and it can make a big difference in the answer that one receives.[2]

TLA also suggests various means to expand the reach of assessment and cover more ground. One way is to plot projects along an assessment timeline that is three to five years into the future rather than limiting one's attention to the current year. Another is to distribute in some degree the role of assessment. The project implemented at KSU employs both methods.[3]If all of a library's assessments target the instruction program, or investigate only the question of satisfaction, or exclusively apply survey methodology, this leaves a great many stones unturned. TLA hopes to inform a well-rounded assessment program that acknowledges and attempts to integrate diverse and potentially competing streams of information.

Perhaps the best recent example of similar work was published by Madeline Kelly of George Mason University in 2014. The author organized a variety of assessments into three tiers, each representing an increasing level of investigation.[4] These tiers were "stackable" in the sense that every step up included the tools and assessments of the lower tiers but added additional ones. If the university offers only a bachelor's degree in a discipline, a tier 1 level assessment is appropriate, but a PhD program would require a tier 3 level of investigation.

The most striking difference between the models at KSU and George Mason is the degree of project centralization. The George Mason approach gathers input from liaisons but in large part is implemented by a single individual, whereas the approach presented here is distributed among liaisons by design. This is in accord with the goals of the two projects. Collection assessment at George Mason was driven in large part by the desire to "Achieve Carnegie Very High Research classification."[5] At KSU, the goals were more pragmatic: to apply data-driven decision making to the selection and withdrawal of library materials.

Methodology

The collection assessment project integrates three functions of the KSULS: Assessment, Collection Development, and the Undergraduate Faculty Liaison Program. The plan was designed to be modular, meaning it was assembled from discreet parts, each able to stand on its own. This provides library professionals a working model that can be built on as time, capabilities, and new assessment tools become available.

Data Types

To answer different questions about a target (in this case, the target is a subset of the monographs collection) requires different sorts of data.

- Use: The question of use may readily be answered with circulation statistics and ILL

titles lent to other libraries. Going forward, we hope to look at in-house use as well.
- Satisfaction: To address the question of satisfaction, liaisons reviewed LibQUAL+® data to see how the relevant user subgroup compared with all respondents in terms of their responses in the information control dimension. Liaisons also surveyed their faculty to determine levels of satisfaction with subject specific collections.
- Need: Liaisons examined the question of need in three ways. First, they pored over comments submitted by LibQUAL+ respondents from the corresponding user subgroup. Second, they surveyed their faculty on the extent to which library collections were meeting their research and teaching needs. Third, liaisons reviewed ILL books borrowed from other libraries, the belief being that a book lent out is a measure of use, but a book borrowed in is a measure of need.
- Authority Metrics: The question of authority refers to how well the collection complies with some standard or authoritative judgment. Liaisons consulted the Bowker Book Analysis System to review core title lists and compare them with library holdings. Bowker provides a percentage of core titles held by LC range as well as a title-by-title display of titles held and not held. Liaisons also used the Thomson Reuters InCites™ tool to identify the top 25 journals in a subject area and then determined the library's coverage for each.
- Benchmarking: The question of benchmarks was not part of the pilot year. In the future, the KSULS hopes to license the OCLC WorldShare® Collection Evaluation product for this purpose.

Timeline

The assessment cycle unfolded over a thirteen-month period beginning June 1, 2015 and concluding June 30, 2016. The cycle involved three phases. In Phase 1, the project coordinators worked with partners from the Technical Services, Virtual Services, and Access Services units to acquire and format data for participating liaisons to evaluate. This is a complex task requiring consistency and clear communication and so it was imperative for this function of collection assessment to be centralized, as opposed to the liaisons acquiring this data directly. Once library data was gathered and formatted, it was shared with participating liaisons via the library intranet, which is built in Microsoft SharePoint.

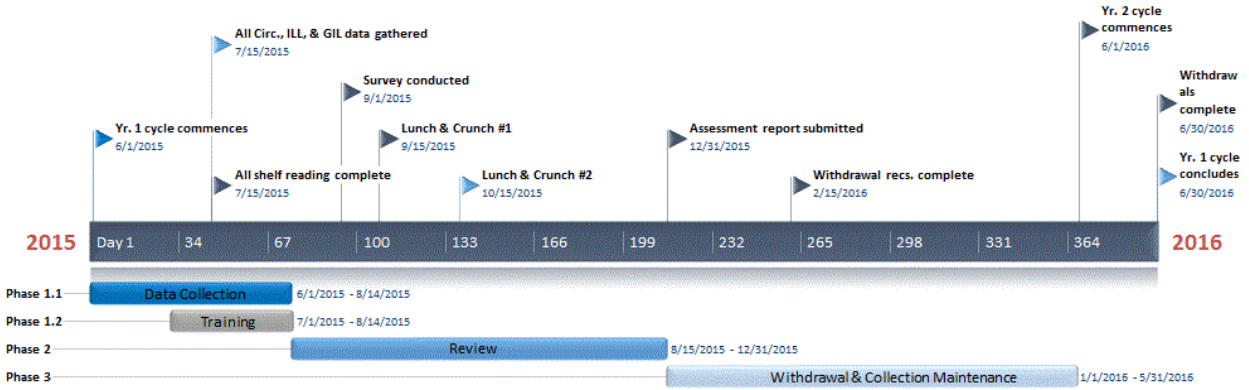
Phase 1 also included a training component. Project coordinators, participating liaisons, and other personnel attended a meeting informing them what they could expect over the coming year, their responsibilities, and what resources were available to help them.

Phase 2 occurred during the fall semester and was the review phase. Participating liaisons worked with the project coordinators to complete an assessment report for the call number range or ranges associated with their subject area. The report, consisting of twelve sections (discussed below), brings together a wealth of data from around the organization and provides the liaison with a chance to review the data, make sense of it, and plot a future course of action. Twice during Phase 2, participants met for "Lunch 'n' Crunch" sessions, where they gathered to complete their assessment reports under the guidance of the project coordinators.

Phase 3 took place in the spring semester and was focused on collection maintenance. Weeding projects fell heavily on access services personnel to physically remove materials from the shelf and on technical services personnel to remove the materials from the catalog. Due to this potential burden, lists of recommended withdrawals provided by the liaisons were held in reserve for future weeding projects. Though competing priorities interfered with the creation of these lists in the pilot year, all of the pieces are in place to do so in the future, pending the establishment of a set of guidelines.

The three phases of the assessment cycle complete an assessment year (see Figure 1). Within five years, the KSULS hopes to have assessed the entire monographic collection. At this point, the five-year cycle repeats, meaning that assessment for any subset of the collection would never be more than five years old.

Figure 1: 13-Month Collection Assessment Cycle



Results

In the fall semester of each assessment year, participating liaisons will create a report for their designated part of the collection. The report consists of 12 sections.

- **Section I: Who has a stake in this collection?** The purpose of this section is to identify other liaisons and graduate librarians (based on their collection areas) who have a stake in the collection. For example, the sociology report references the Master of Social Work program and the political science department. This report also includes enrollment numbers for each, providing a sense of weight for each stakeholder.
- **Section II: What are the recent investments in this collection?** In section II, the liaison inputs dollars spent during the past five years along with number of items purchased. Liaisons are also encouraged to spell out collection strategies that they have pursued.
- **Section III: Describe the collection.** In this section, the liaison describes the physical holdings of the collection. This includes item counts by relevant LC range, average publication date, physical location, and percentages of holdings published in the past 5, 10, 15, 20, and 25 years. In the future, we plan to gather similar information for e-books in this section as well.

Table 1: Table Age Summary (Section 3C)

LC Range	% <5 Yrs.	% <10 Yrs.	% <15 Yrs.	% <20 Yrs.	% <25 Yrs.
H	4.8%	11.2%	17.2%	25.1%	36.8%
HM	7.2%	14.8%	21.3%	27.8%	37.0%
HN	2.6%	7.7%	12.5%	19.1%	28.1%
HQ	4.5%	10.3%	16.2%	23.2%	35.7%
HS	4.2%	4.2%	6.3%	12.5%	25.0%
HT	5.7%	15.9%	24.3%	30.4%	36.9%
HX	0.6%	1.8%	3.3%	5.0%	11.4%

- **Section IV: What is the usage of this collection?** Section IV captures collection usage in terms of circulation statistics for each relevant LC range. The liaison also determines a ratio for the percent of the collection used and unused in the past five years. Section IV also includes numbers lent out using ILL and consortium borrowing. The collection assessment plan interprets a book lent out through ILL as a type of circulation, whereas a book borrowed in through ILL is a type of need. In the future, we plan to collect in-house use and e-book use statistics in this section as well.
- **Section V: What are the existing needs?** Section V captures numbers for relevant monographs borrowed in through ILL and the consortium borrowing program. Also included within this section are results from a survey of faculty on their collection needs for teaching and research.
- **Section VI: Are users satisfied?** Here, liaisons report results from survey items pertaining

to faculty satisfaction with subject specific collections. Liaisons also look at LibQUAL+ results to determine how collection satisfaction differs between the relevant subgroup and all respondents. The sociology liaison compared respondents who reported as humanities and social sciences with all LibQUAL+ respondents and discovered much lower adequacy means for the subgroup than for all respondents.

Table 2: Comparison of Adequacy Mans for Humanities/Social Science Respondents vs. All Respondents (Section 6B)

Item	Question Text	Adq. Mean	Overall Adq. Mean	Differ-ence	n
IC-1	Making electronic resources accessible from my home or office	0.13	0.58	-0.45	214
IC-2	A library web site enabling me to locate information on my own	0.23	0.50	-0.27	199
IC-3	The printed library materials I need for my work	0.33	0.62	-0.29	172
IC-4	The electronic information resources I need	0.48	0.79	-0.31	707
IC-5	Modern equipment that lets me easily access needed information	0.29	0.52	-0.23	211
IC-6	Easy-to-use access tools that allow me to find things on my own	0.26	0.48	-0.22	209
IC-7	Making information easily accessible for independent use	0.36	0.52	-0.16	163
IC-8	Print and/or electronic journal collections I require for me work	0.37	0.65	-0.28	246

- **Section VII: Identify areas of relative strength and weakness.** Using the Bowker Book Analysis tool, a library may compare its holdings against a list of core titles to determine where the collection is strong and where it weak. The tool gives a quantitative analysis as well as a list of core titles held and not held.

Table 3: Bowker Book Analysis for Sociology Ranges (Section 7A)

LC Classification	Core Titles in Library	Core Titles NOT in Library	Total # Core Titles	% of Core Titles Held
(H1-99)Social sciences (General)	**0**	**0**	**0**	**0.00%**
(H1-99) Social sciences (General)	34	52	86	39.53%
(HM401-1281)Sociology (General)	**0**	**0**	**0**	**0.00%**
(HM1-434) Sociology (General)	107	171	278	38.49%
(HM435-477) History of sociology. History of sociological	1	12	13	7.69%
(HM481-554) Theory. Method. Relations to other subjects	11	28	39	28.21%
(HM621-656) Culture	5	19	24	20.83%
(HM661-696) Social control	4	8	12	33.33%

- **Section VIII: How does the collection compare with that of our peers?** The plan for this section is to use OCLC's WorldShare tool to compare portions of the library's collection to like portions at peer institutions. To date, our library has not acquired this tool.
- **Section IX: Journal analysis.** Section IX uses the Thomson Reuters InCites tool to determine

the top 25 journals for a specific subject area. The liaison then documents our coverage for these top journals.

Table 4: Top 5 Sociology Journals by InCites™ Impact Factor with Library Coverage (Section 9A)

Rank	Journal Title	Provider(s)	Dates	Impact Factor	E, Print, Both	Abst. or FT
1	AMERICAN SOCIOLOGICAL REVIEW	SocIndex w/ Full Text	2/1/1936-one year ago	4.390	E	FT
2	Annual Review of Sociology	JSTOR; JStage	1/1/1975-1/31/2009; 1988-present	4.080	E	FT
3	AMERICAN JOURNAL OF SOCIOLOGY	SocIndex w/ Full Text	1/1/1990-one year ago	3.545	E	FT
4	ANNALS OF TOURISM RESEARCH	Science Direct	1973-Present	2.685	E	FT
5	Sociological Methodology	JSTOR; Sage Journals	1/1/1969-8/31/2012; 8/1/1999-present	2.450	E	FT

- **Section X: Database analysis.** Section X is reserved for a database analysis, but this is one module that we did not tackle in the pilot year.
- **Section XI: Librarian stakeholder feedback.** The liaison shares completed sections I through X with all stakeholders including fellow liaisons and graduate librarians. Their observations, comments, and concerns are recorded here.
- **Section XII: Goals and recommendations.** Based on information captured in the previous sections, the liaison spells out goals and recommendations for the coming five years.

Every section of the report has a place for comments so that the liaison can keep track of their observations as they go. These comments are helpful when writing the goals and recommendations section.

Conducting multiple microanalyses of a collection can yield very interesting results. For example, the Collection Age Summary in Section III found that, for the HX range of the LC classification system, which covers socialism, communism, and anarchism, only 11.4% of the KSULS's holdings had publication dates within the last 25 years (see Table 1). Similarly, thanks to the journal analysis section (IX), the sociology liaison discovered that the library was not providing access to the five most recent years of the third most highly ranked sociology journal. A Bowker analysis of HM 435–477, the History of Sociology, found that the library held only one of thirteen core texts in this area, probably unacceptable for a department of 402 majors and a variety of related graduate programs (see Table 3). Conducting the analysis in sections I–XII fosters rich collection knowledge.

Conclusion

The approach to collection assessment as described in this paper is not intended to end the conversation but rather to start one. Nor is it expected that another library could adopt this approach wholesale. The assessments were designed to be highly integrated and the nature of integration dictates that context (perhaps more so than content) is king. By engaging the liaisons so closely, the collection assessment plan aids the synthesis of facts and the creation of deep collection knowledge by the individual who needs it most: the librarians who are building the collection one resource at a time. The pilot year was a success but it will require several years to work out the kinks and to fully work these processes and workflows into the library culture. By doing so, the project coordinators believe that the library will have the capacity to provide more value to the Kennesaw State University community.

Notes

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Continuous Usability Testing: The Importance of Being Iterative When It Comes to Assessment and Development of the Library's Digital Services

Anneli Friberg
Linköping University, Sweden

Introduction

The interest for user experience (UX) and usability in libraries has grown rapidly over the past years and has now become an essential tool for developing and assessing a library's digital services and physical spaces. It is necessary, though, to recognize that UX incorporates much more than just usability. Norman and Nielsen[1] summarize user experience as something that "encompasses all aspects of the end user's interaction with the company, its services, and its products" and continues:

> The first requirement for an exemplary user experience is to meet the exact needs of the customer, without fuss or bother. Next comes simplicity and elegance that produce products that are a joy to own, a joy to use. True user experience goes far beyond giving customers what they say they want, or providing checklist features. In order to achieve high-quality user experience in a company's offerings there must be a seamless merging of the services of multiple disciplines, including engineering, marketing, graphical and industrial design, and interface design.[2]

Furthermore, they state that it is important to separate the overall user experience from usability, since the latter "is a quality attribute of the UI [user interface], covering whether the system is easy to learn, efficient to use, pleasant, and so forth."[3]

At Linköping University Library (LiUB), we are slowly moving towards a "culture of usability" where users are being observed interacting with both physical and virtual spaces, the way Godfrey[4] advocates, but this paper will only focus on the library's online presence. The main objective of this paper is to argue for continuous usability testing as a part of regular library activity.

Usability testing within the library sector is nothing new per se, but it is usually done in the process of launching a new or redesigned website/UI or implementing a new library system. Most often, it has a distinct focus on web development and is not so much used to develop other services or physical spaces. This is confirmed in numerous articles and UX-blog posts and articles by, for example, Gasparini,[5] Godfrey,[6] Broadwater,[7] and Dominguez, Hamill and Brillat.[8] Sometimes the tests are not conducted by library staff, but by external consultants. Our approach, however, is to use an in-house, continuous process which is applied not only to the library's website structure, but also to other digital services such as the search box on the library start page and link resolver user interface and the link resolver icon in the discovery tool.

Rettig asks whether such a thing as "grassroots UX" exists in libraries. She wonders if "the UX hopeful, [who] do not have the mandate or team or job title," can find "ways to apply UX methods to smaller-scale, day-to-day work in the library?"[9] I am inclined to say that it is possible. A UX perspective can and should be integrated in any development project, big or small. The UX philosophy does not have to be initiated as a top-down initiative, and in a sense, LiUB's systematic way of doing usability testing started out as a grassroots initiative.

Context

Linköping University (LiU) is one of 16 universities in Sweden. LiU has four campuses in three cities (Linköping, Norrköping and Stockholm) and has four faculties: Science and Engineering, Medicine and Health Science, Arts and Science, and Educational Sciences. LiUB consists of four physical libraries, one on each campus, with approximately 90 staff members in total.

In order to make sure that LiUB contributes in a useful and valuable way to student learning and research, we have tried to find different ways to understand our users' needs and behaviour. We use our insights to improve the digital library in order to provide a user-friendly and intuitive way for students

and researchers at LiU to access the information they need for their studies and research.

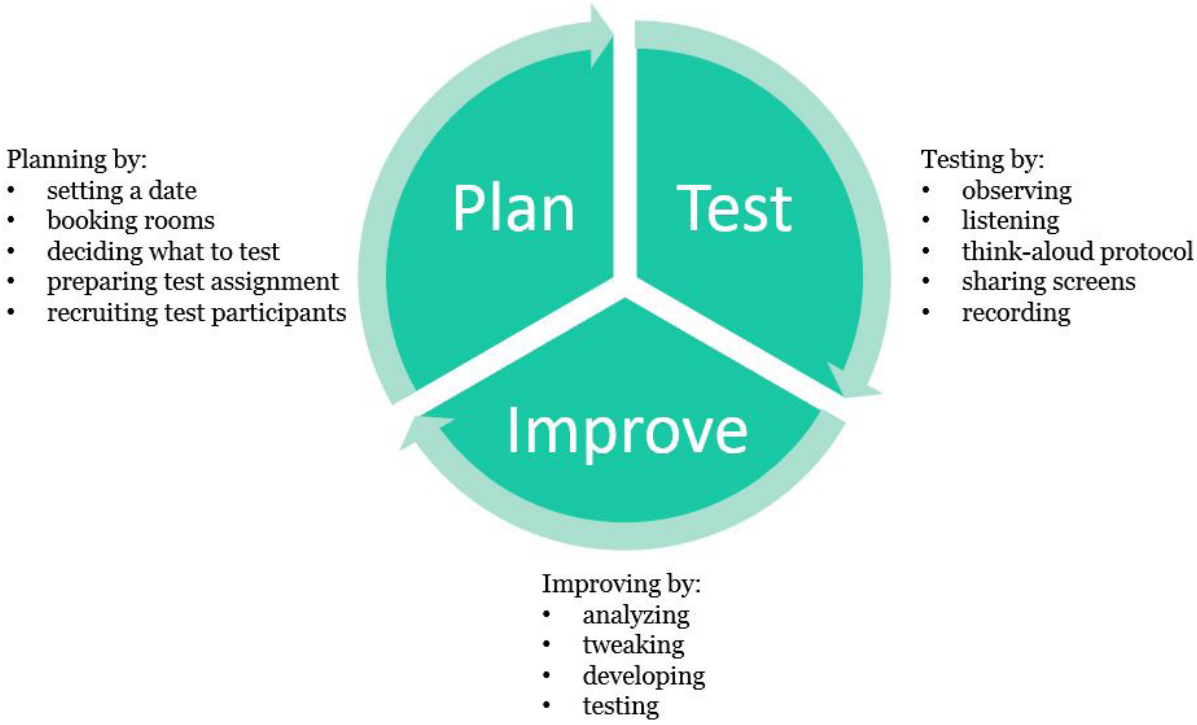
The groundwork for the library's systematic user involvement was done within a web strategy project in 2014. Throughout the project, we had the opportunity to test different methods for collecting user data. During this time, we also formed a usability team at the library. The team consists of five people (three of whom are librarians), including myself, with different skills and roles such as system manager, computer programmer, webmaster, UX expert, and cognitive scientist. Over the last 24 months, the usability team has gathered once a month to do testing. The advantage of having a permanent usability team is that the library does not have to mobilize a team whenever the need occurs. This approach is also advocated by Nichols, Bobal and McEvoy:[10]

> A permanent usability team allows an organization to build expertise and tackle more usability projects than ad hoc teams. Having a usability team already in place makes it more likely that usability studies will be done on projects that may otherwise have been overlooked because of the 'burden' of asking staff to be part of another project on top of their already busy schedule.

The LiU Library Experience

The web strategy project in 2014 established usability and user benefits as central to the continuous web development process. In order to accomplish a user-centered library website we decided to find a doable model for user involvement. The book *Rocket Surgery Made Easy: The Do-It-Yourself Guide to Finding and Fixing Usability Problems* by Steve Krug[11] became our inspiration. Our workflow is illustrated in Figure 1.

Figure 1 Workflow for usability testing at LiUB



When we first started, we asked ourselves how many test participants were needed. According to Nielsen, five users are enough when doing usability testing, because then "you almost get close to user testing's maximum benefit-cost ratio."[12] Steve Krug on the other hand claims that three users are good enough for "the do-it-yourselfer," considering "you're not interested in what it takes to uncover most of the problems; you only care about what it takes to uncover as many problems as you can fix."[13]

As we evidently belong in the category of "do-it-yourselfers," we started with three test participants per session during the first year. The previous semester we decided to increase the number to four users per session, since we thought we had the capacity to expand. Although, after our last evaluation we decided to go back to only three users again, since it was difficult for me as facilitator, but also for the observers, to stay focused and perceptive with four users and to get enough time for summarizing and debriefing. Krug made a list of arguments why three test participants are enough, and after trying with four, I am willing to agree. Some of Krug's reasons are:[14]

- The first three users are very likely to encounter many of the most significant problems related to the tasks you're testing.
- Finding three participants is less work than finding more.
- Testing with three users makes it possible to test and debrief in the same day.
- When you test with more than three at a time, you often end up with more notes than anyone has time to process—many of them about things that are really 'nits.' This can make it harder to see the most serious problems—the 'can't see the forest for the trees' effect.

For the tests, we use randomly chosen employees and/or students as test participants. In my experience, engaging face to face is the most successful way to recruit users. For example, I usually recruit students I meet in the library. Regarding employees, we always recruit research or teaching staff, such as PhD students, lecturers, university teachers, and professors. My experience is that most students and employees I ask are willing to help us as long as they can find the time for it. They all want to be part of a process that aims to improve the user experience.

When it comes to deciding what to test, we make a preliminary plan at the beginning of each semester. This plan sometimes changes during the semester. What we actually test depends on different projects in progress at the library. We never test systems or interfaces that we cannot alter or modify ourselves to some extent.

We conduct usability testing monthly during each semester, which gives us approximately eight test sessions per year. This enables an agile and iterative approach to assessing the users' experiences of the digital library as well as helping in the development of our digital services.

On the test day, the usability team divides into two groups in two different locations: a test room and an observation room (see Figure 2). The facilitator and one observer go to the test room, while the rest of the team goes to the observation room. Often the latter are accompanied by other observers and stakeholders; sometimes they are colleagues from other departments within the university, such as the division for IT Services, and sometimes they are external, such as librarians from other universities.

Figure 2: Observation room (left) and test room (right)

We combine different methods like observation, think-aloud protocol, and capturing screen activity. By using different practices that complement each other, we avoid the uncertainty of using just one method. One of the benefits of triangulation of data is that we get a more complete picture of the usability issues that need to be addressed.

Each test person is given a specific assignment based on a common user scenario for the service to be tested. The test person attempts to complete the assignment while thinking aloud. If needed, the facilitator encourages the test participant to think aloud and describe what he/she is trying to do. At the same time, the team in the observation room records what the test person says and does. We use Camtasia to record screen activity, and we set up an Adobe Connect meeting to share screens between the test room and the observation room. Obviously we do not record anything without permission from the users. Before we begin the test session, the test participant signs a written consent.

After the test, the facilitator and observer from the test room join the rest of the usability team in the observation room and a debriefing session starts. We then collect and discuss the usability problems we have noticed and put them together in an aggregated list of feasible improvements. We also prioritize the things on the list.

After each test session, the usability team starts to improve the things listed. Depending on what the problems are and what has to be done, we involve different colleagues outside the usability team. The recordings have proven valuable for the analyses and developments in between the test sessions. They are an essential complement to the observers' notes.

Another valuable complement is so-called guerrilla testing, which we do sometimes in between the monthly test sessions. This type of testing is both agile and flexible. It is a "low cost method of user testing. The term 'guerrilla' refers to its 'out in the wild' style, in the fact that it can be conducted anywhere..."[15] When we perform guerrilla testing, we approach people in the library and ask them to give quick feedback. This fits well with our thinking that some testing is better than no testing.

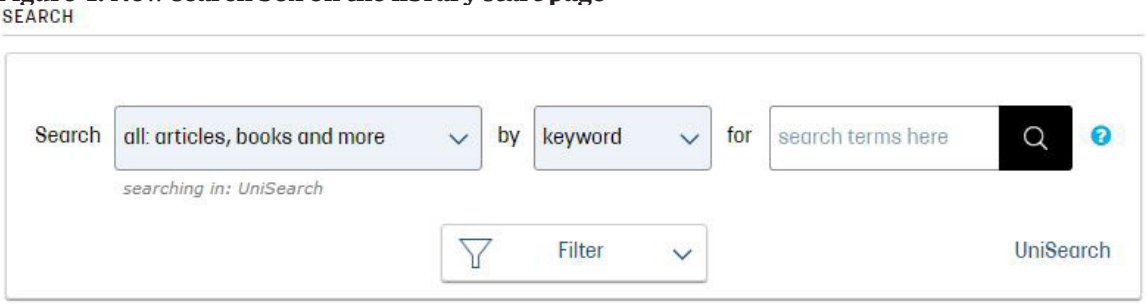
Outcomes

The improvements we have made as a result of what we have seen during our usability testing ranges from very small terminological changes to more structural changes on our website. One of the first things we tested was the information architecture for a new library website. For that, we used a tool called Treejack. We did one test session with students and one with employees. This enabled us to get valuable feedback on the site structure.

For several years, we had a tabbed search box on the library start page (see Figure 3). Last year we decided to renew the design, inspired by the design of the search box on the MIT Libraries website. Before we launched the new search box (see Figure 4), we made a prototype that we used to perform both regular usability testing and guerrilla testing. The feedback we got gave us useful input to the design process.

Figure 3: Old search box on the library start page

Figure 4: New search box on the library start page



We have also tested different features and new services for the discovery tool, such as a new search service for e-publications. We tested this service twice—once with undergraduate students and once with PhD students. In addition to getting feedback on what adjustments to make, we also learned that undergraduate students have quite a different attitude to journals than PhD students have. We have seen this in other situations, for instance when doing interviews as part of the web strategy project in 2014, but seeing this again during usability testing confirmed our previous insights.

Things we have also tested and improved are terminology, holdings information, and link resolver user interface. Sometimes we make changes and then we do a new round of testing, but more often we get indirect feedback on changes we have done while testing new things.

A bonus effect is that LiUB's work has been noticed and recognized outside of the library, which has helped change the image of the library. Additionally, usability testing is an excellent way to make our services more visible to users.

Conclusion

A vast understanding about our users is the foundation of any user-centered development. By combining qualitative and quantitative methods and applying a UX-perspective we are better equipped to meet our users' changing needs and behaviour. It allows a more agile workflow. The trick is to keep it simple. We do not consider ourselves researchers. What we do are continuous modifications based on input we get from real users. Our motivation is to enhance users' experiences of the library's digital services.

Based on our experiences from the last 24 months, we have found that systematic usability testing can and should be a part of the regular library activity and that it can encompass so much more than just the website structure. The key to success is the model itself, particularly when it is carried out monthly during the academic year. By involving real users continuously, we avoid getting stuck in our own internal assumptions of how users interact with the library's digital services.

Endnotes

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Measuring Impact of Liaison-Faculty Relationships: A Multi-Factor Assessment Framework

Lisa R. Horowitz, Courtney Crummett, and Tracy Gabridge
Massachusetts Institute of Technology, USA

Abstract

Over the past decade, liaison librarian practice at the MIT Libraries and elsewhere has evolved from a collections and reference focus towards user-focused roles of outreach and instruction, similar to roles described in ARL's report, "New Roles for New Times: Transforming Liaison Roles in Research Libraries." Traditional assessment practices for liaison work, such as counting reference transactions or instruction sessions, or evaluating collections coverage, cannot capture the impact that strong relationships with university communities have on their teaching, learning, and research activities.

Through assessment of activities intended to enrich relationships between liaisons and faculty, this study evaluated the impact of liaison librarian outreach. A mixed-methods assessment process used desired outcomes, objectives, measures, targets, and results to generate a multi-dimensional view of liaison work that neither depended solely on traditional kinds of inputs and outputs, nor on surveys or focus groups to generate data. The study focused specifically on relationships that were developed between liaisons and new faculty. Of twelve measures addressing three objectives, the MIT Libraries were able to show impact for nine, while gathering useful benchmark data for the rest. The results of the assessment were then used to further improve liaison practice. Implementation of this assessment has proven especially valuable when what is being measured (in this case, relationships) is intangible and hard to quantify.

Introduction

Liaison librarian practice at the MIT Libraries has been evolving away from a collections and reference focus towards user-focused roles of outreach and instruction over the past decade, similar to roles described in ARL's report, "New Roles for New Times: Transforming Liaison Roles in Research Libraries."[1] Traditional assessment practices for liaison work, such as counting reference transactions or instruction sessions, or evaluating collections coverage, do not capture the impact that strong relationships with university communities have on their teaching, learning, and research activities.

This article describes a mixed-methods assessment process that was used to increase understanding of the impact of liaison librarian outreach activities. The extendable and repeatable assessment framework uses desired outcomes, objectives, measures, targets, and results to generate a multi-dimensional view of liaison work that neither depends solely on traditional kinds of inputs and outputs, nor on surveys or focus groups to generate data. The results of the assessment illustrate the impact that a set of faculty-liaison practices has on faculty and library services. Details of the assessment and the assessment framework demonstrate how it can be adapted for other kinds of assessment.

Background

The MIT Libraries support a community of about 11,000 students, of which 40% are undergraduates and 60% are graduate students. They are taught by a faculty of about 1,000 and a staff of about 9,000. In 2010, the MIT Libraries implemented a system-wide reorganization, one aspect of which brought the liaison librarians into a single department, spanning all library locations and all academic disciplines. At that time, liaison librarian position descriptions were updated to emphasize new and existing roles, such as outreach to MIT communities. In the first year, the department developed shared principles for liaison work that crossed disciplines and subject specialties.

As part of that effort, the liaison department considered the kinds of practices all liaison librarians use, despite the high variability of the research and teaching approaches across the discipline-based communities they serve. Coming together as a team, they began to build common practices such that each liaison librarian no longer had to invent an approach on their own. One area the department tackled first was the practice of contacting new faculty. The

institute welcomes between 40 and 50 new faculty each year.

Prior to the reorganization, liaisons' practices of contacting new faculty were inconsistently implemented. There was no systematic way to learn of new faculty appointments across all academic departments, and liaisons conducted a variety of outreach activities to establish contact. The newly organized department implemented a common approach in order to build a strong, relationship-focused practice for faculty. A list of new faculty is now routinely acquired from the MIT Office of the Provost and a list of activities and resources (sample e-mails, possible discussion points, etc.) were created to enable the liaisons to approach this task consistently. Additionally, a minimum set of expectations was developed. Each of the 23 librarians with liaison responsibilities at the time of the study was expected to:

- Contact every new faculty member in the liaison's assigned departments, labs, or centers
- Make an effort to learn about the new faculty member
- Try for a face-to-face meeting, with at least one follow-up message if initially unsuccessful

Methodology

An assessment process in the MIT Libraries has come to involve a cyclical series of steps originally based on the Balanced Scorecard[2] system that follow the initial **goals** of a project or service, identify the **objectives** that are to be assessed, determine what **measures** illustrate success in achieving the objectives, define **targets** for each measure, and then select tools to capture the data. These are the steps involved in developing this multi-factor framework for assessment.

In October 2010, assessment of the impact of MIT Libraries' liaisons' practices for connecting with new faculty began with an emphasis on desired outcomes based on the minimum liaison responsibilities just described. Noting that the liaison responsibilities were just that, a set of activities required of the liaisons but disconnected from any desired outcomes or impact, the assessment group—comprising the head of the liaison department, two liaisons, and the assessment librarian—began by asking about the goals of the service. Why was contacting new faculty important? What would the faculty gain from these contacts, and how would relationships improve? The group identified three desired **goals** for contacting new faculty:

1. To increase the faculty member's awareness of library services that would help them in their research or teaching
2. To form a productive relationship with the libraries from the start, and to bridge their experience from a previous institution to MIT so they can return to their research more quickly
3. To contribute to having informed, aware students by enabling informed, aware faculty

With these goals, the assessment group was then able to brainstorm and define three specific **objectives** that could be accomplished to achieve each goal (Figure 1). The main objective was to establish ongoing, reciprocal relationships with the new faculty. By doing so, liaisons would increase faculty awareness of library services, and, in turn, would learn more about what the new faculty members needed in order to configure appropriate services to support them well.

Figure 1

Objectives
1. Establish ongoing reciprocal relationships with faculty
2. Increase faculty's awareness of the services that can help them in research and teaching
3. Learn more about new faculty needs to improve our liaison work and services to them

The assessment group then examined each objective to identify measures that would indicate success. In order to corroborate and confirm findings, multiple measures were chosen that together would offer a fuller indication of impact. Measures needed to accomplish three things:

1. Have an obvious connection to the objective to illustrate achievement of that objective.
2. Have a clear action that would indicate success.
3. Approach the objective from different perspectives, showing how both faculty and liaisons would be impacted by success.

The group developed, refined, and finalized sets of measures that filled these criteria for each of the three objectives (Figure 2). For example, one indicator to confirm that liaisons had established ongoing reciprocal relationships with faculty might be the percentage of new faculty who proactively made contact or followed up with their liaison within one year. Evidence that liaisons were learning more about new faculty needs to improve services would include a number of proposed new services or activities that resulted from contacts with new faculty. (For a complete list of measures, see Figure 2.)

Figure 2

Objectives	Measure
1. Establish ongoing reciprocal relationships with faculty	Percent of new faculty contacted in their first year
	Percent of contacts that resulted in a reply from the new faculty member
	Percent of contacts resulting in face-to-face meetings
	Number of new faculty who proactively make contact or follow up with their liaison within one year (not counting initial contact back and forth)
	Percent of librarians who feel that they have an ongoing relationship with the new faculty member
2. Increase faculty's awareness of the services that can help them in research and teaching	Percent of new faculty who use library services for research or teaching purposes within their first years of research at MIT (1–3 years)
	Percent of new faculty who have shared library services with students
	Number of courses in which librarians are invited to participate with new faculty
	Percent of faculty who consider library services important or essential to their research and teaching
	Percent of new faculty aware of their liaison
3. Learn more about new faculty needs to improve our liaison work and services to them	Number of proposed new or changed, major or minor initiatives or activities that resulted from contacts with new faculty
	Percent of librarians who say they have made collections decisions based on what was learned about new faculty member

Objectives	Measure
	Percent of face-to-face meetings with faculty that resulted in the librarian's following up with additional information
	Percent of new faculty whose liaisons reported learning about them

The next step in the assessment framework is always one of the most difficult in any assessment process when benchmarks or previous assessment does not already exist: defining a level of achievement, a target, for each measure that would illustrate that the objective was accomplished. Because the liaison department was a new department and this work was a new type of assessment, targets were established based on informal and anecdotal data, such as discussions with the liaison librarians, past experience, results of previous surveys, etc. For example, for the measure "percent of contacts resulting in face-to-face meeting," the group developed a target of 40% based on prior liaison experience and the understanding that faculty have many demands on their time. A complete list of specific targets can be found in Figure 3.

Figure 3

Objectives	Measure	Target
1. Establish ongoing reciprocal relationships with faculty	Percent of new faculty contacted in their first year	100%
	Percent of contacts that resulted in a reply from the new faculty member	60%
	Percent of contacts resulting in face-to-face meetings	40%
	Number of new faculty who proactively make contact or follow up with their liaison within one year (not counting initial contact back and forth)	25%
	Percent of liaisons who report having an ongoing, reciprocal relationship with the new faculty member	No target set
2. Increase faculty's awareness of the services that can help them in research and teaching	Percent of new faculty who use library services for research or teaching purposes within their first year of research at MIT (1–3 years)	95%
	Percent of new faculty who have recommended library services to students	15%

Objectives	Measure	Target
	Number of courses in which librarians have engaged in subsequent conversations about new opportunities for library instruction	2
	Percent of faculty who rate library services important or essential to their research and teaching	75%
	Percent of new faculty aware of their liaison	No target set
3. Learn more about new faculty needs to improve our liaison work and services to them	Number of proposed new or changed, major or minor initiatives or activities that resulted from contacts with new faculty	4
	Percent of librarians who say they have made collections decisions based on what was learned about new faculty member	80%
	Percent of face-to-face meetings with faculty that resulted in the librarians following up with additional information	50%
	Percent of new faculty whose liaisons reported learning about them	100%

The actual results would eventually be weighed against those targets thoughtfully. Having a reflective discussion before and after gathering the data allowed the assessment group to consider what "impact" really meant, and the results of this study would then establish benchmarks for future assessment.

The importance of determining targets cannot be understated. The number itself has almost no value in and of itself; it is the *conversation,* the *reflection,* and *discussion* that leads to a target that is most important, as it manifests the values that underlie the anticipated outcome, and how much effort should be and is expected to be spent to reach that target.

With all three major aspects of the framework established, the assessment group was able to draw up an implementation plan that identified tools. The tools selected to gather data for each of these measures varied. The group's intent was to identify as few tools as possible that could gather the most information, while simultaneously asking the least from faculty, as they were least likely to respond to a lengthy survey or an interview request. Three tools were identified, and measures were adjusted if needed to get the most out of the tool.

The first tool was the new faculty contact worksheet (Appendix A). In the first six months, each liaison was asked to fill out a worksheet that captured some elements of their meetings or contacts with faculty, as well as the preparation involved. These worksheets were submitted to the head of the liaison department to collate and evaluate. The data from the new faculty contact worksheets would be compiled to determine six of the identified measures.

At no time was the aggregated data from the new faculty contact worksheet ever used to evaluate an individual liaison. Because each liaison had varying numbers of new faculty, different kinds of relationships with individual faculty, and strengths in how they worked, this exercise was not intended to appraise their work as individuals. Instead, data was collected to determine how well liaisons as a department were impacting the teaching

and research work of faculty. This was important to reiterate to the staff to reduce any hesitancy in supporting the assessment project and in encouraging the new practices.

As work proceeded in this assessment, one issue arose: liaisons did not have a common understanding of what defined an "ongoing relationship" with faculty. To generate that agreed understanding, liaisons participated in a group activity in which they characterized their faculty relationships to provide feedback about what constitutes an "ongoing relationship," as well as to illuminate their perceptions about how relationship-building was going. This activity served as the basis for a liaison follow-up worksheet (Appendix B).

The liaison follow-up worksheet was sent to liaisons after one year. On this worksheet, liaisons reported any further developments of their relationships with these particular faculty members, and they described any new or revised services that were built on their new knowledge of these faculty. The liaison follow-up worksheet would compile data on five of the identified measures.

At the end of the first year, the head of the liaison department sent a brief e-mail survey (Appendix C) to the new faculty about their use and needs for library services. The questions were based on the initial three objectives for contacting new faculty (see Figure 1). The brief e-mail survey compiled data for three identified measures, overlapping some of the others, giving a contrasting faculty perspective.

In a fortunate circumstance, the assessment group was able to glean additional data from the 2011 MIT Libraries Survey,[3] administered triennially. Questions were asked about faculty awareness and use of library services, as well as the importance attributed to these services. The Office of Institutional Research that administers that survey was able to generate a subset of aggregated results that applied to only the new faculty in our study, which could then be compared to the responses from the new faculty survey.

Results

The assessment group applied the multifactor framework to the liaisons' outreach towards the 44 new faculty and tallied the results. The multifactor aspect of the framework offers several viewpoints for each objective, encouraging thought about each one. Overall, the project to implement new faculty contact practices that impacted library services was successful according to the results (see Figure 4). Out of twelve targets set, nine were met or exceeded, showing that the new faculty-contact practices led to relationships with new faculty that the department could agree were robust, and had an impact on library services and on the faculty's teaching and research activities. For the three targets that were not met, the assessment has established benchmarks from which to thoughtfully improve the practice.

Figure 4

Objectives	Measure	Target	Result
1. Establish ongoing reciprocal relationships with faculty	Percent of new faculty contacted in their first year	100%	100% (44/44)
	Percent of contacts that resulted in a reply from the new faculty member	60%	66% (29/44)
	Percent of contacts resulting in face-to-face meetings	40%	48% (21/44)
	Number of new faculty who proactively make contact or follow up with their liaison within one year	25%	61% (27/44)

Objectives	Measure	Target	Result
	Percent of liaisons who report having an ongoing, reciprocal relationship with the new faculty member	No target set	48% (21/44)
2. Increase faculty's awareness of the services that can help them in research and teaching	Percent of new faculty who use library services for research or teaching purposes within their first year of research at MIT (1–3 years)	95%	83%° (out of 12 respondents)
	Percent of new faculty who have recommended library services to students	15%	47% (out of 12 respondents)
	Number of courses in which librarians have engaged in subsequent conversations about new opportunities for library instruction	2	3
	Percent of faculty who rate library services important or essential to their research and teaching	75%	59%*° (out of 12 respondents)
	Percent of new faculty aware of their liaison	No target set	92%* (out of 12 respondents)
3. Learn more about new faculty needs to improve our liaison work and services to them	Number of proposed new or changed, major or minor initiatives or activities that resulted from contacts with new faculty	4	5
	Percent of librarians who say they have made collections decisions based on what was learned about new faculty member	80%	33%° (14/44)
	Percent of face-to-face meetings with faculty that resulted in the librarians following up with additional information	50%	61% (27/44)

Objectives	Measure	Target	Result
	Percent of new faculty whose liaisons reported learning about them	100%	100% (44/44)

**59% on targeted survey of new faculty responding to "How important are these services to your research or teaching activities?" on 2011 MIT Libraries Survey. Filtered for new faculty responses, 92% responded important or essential to "how important is each for your research or coursework?" on a variety of specific library services. Both represent a sample size of about 12 respondents.*

º This target was not met.

The assessment group showed good intuition about how many faculty would respond to liaison contacts and how many would agree to a face-to-face meeting, resulting in targets that were easily met. More surprising was how many faculty proactively contacted their liaison librarian again within the first year. It is interesting to note that while liaisons assessed that they had ongoing, reciprocal relationships with almost 50% of the new faculty, they also reported that more than 60% of the faculty had contacted them within their first year of arriving at MIT. Despite that higher rate of contact by faculty to their liaison, this did not correlate with interpretation by liaisons as a sign of a well-established, reciprocal relationship. This may indicate that this metric was not a realistic measure of an ongoing, reciprocal relationship.

For the objective of increasing the awareness of new faculty to services that are useful to them, the results were mixed, both from the perspective of getting results lower than expected, as well as some contradictory data from the different tools. The faculty survey data show that 83% of new faculty use library services for research or teaching purposes within their first few years of research at MIT, which is below the target of 95% despite the fact that 100% of new faculty were contacted with some sort of e-mail regarding library services. That could simply be that those faculty are not aware that they are using online library services, or that they really do not use journal articles, other library materials, or other library services at all due to the nature of their discipline or their current research.

Of more concern is that faculty did not rate the library services as important as anticipated (59% versus the target of 75%). These results did differ from a similar question posed on the MIT Libraries' triennial survey where 92% of new faculty rated specific library services as important. Of course, there are two important issues here. First is the tiny sample size. Only about 12 faculty members responded to each of the two surveys (it is unknown if these were the same 12). Although this is 27% of the total, usually considered a responsible response rate for faculty, it cannot be said to be representative of the total 44. Second, the questions on the two tools were different, and it is therefore impossible to compare the results explicitly.[4] However, these results do show the need for further investigation.

Efforts to establish a strong set of work practices in contacting new faculty did enable the liaisons to learn more about faculty needs and to address those needs proactively by adjusting or advocating for changes in services. Contacting new faculty did lead to new instructional opportunities and many new faculty indicated that they were actively telling their students about library services as a result of librarian outreach. There were five instances of new or different services—such as hosting a new kind of event with the community, developing a proposal to change a materials delivery policy, and changing an instructional approach for a class. On another measure, as expected and in alignment with the 100% target set, all liaisons did report taking steps to learn about the new faculty's research interests. Additionally, after the initial contact, they took the opportunity to follow up with additional information to about 60% of the new faculty, whether or not they had a face-to-face meeting.

One target that was not met was related to adjusting our collection practices due to new faculty research interests. The assumption made in setting that target was that the majority of new faculty contacts would result in an adjustment to collection practice. Because we are a major research institution, though, it is actually likely that our selection practices are essentially stable across collections in those areas,

and that only minor tweaks based on new faculty research areas would be required.

This assessment project was useful for giving the liaison department some insights into its operational effectiveness as well as the impact of its work on library services. It proved valuable for investigating the intangible measure of "relationship building," and stimulated ideas for further improving new faculty contact practices in particular, and outreach practices in general. Having a common set of practices and expectations for contacting new faculty provided a useful structure to encourage liaisons to do this work. By having a common framework, liaisons had a structured way to share their ideas and tactics for relating to new faculty, which can inspire and enrich the activities of their liaison colleagues. Even though the needs of new faculty vary significantly across disciplines, having a common set of practices and expectations can still be put into place effectively without negatively affecting an individual's custom approach to their faculty community. At the same time, while the results of this assessment project have been useful towards understanding aspects of operational effectiveness, what is very important is how the data is used to improve those operations going forward.

Conclusions and Next Steps

This assessment was done about five years ago. The department continues to gather data about initial contacts with new faculty. Having liaison librarians fill out information regarding their contact with each new faculty member reminds them of best practices around this infrequent task. The data gathering now includes questions to gather intelligence about the needs and pain points for new faculty. The department collates and shares that information with the rest of the library system to inform the improvement or development of library services.

However, this level of assessment effort, using the multi-factor framework with its many objectives, measures, and tools, proved too time-consuming for ongoing practice. Since then, we have expanded the contact practices to new post-docs, and new librarians use the practices to meet their entire faculty. In the meantime, since the report from the Task Force on the Future of Libraries[5] has been written, our intent is to generate new assessment based on issues identified during implementation of these directions.

The most commonly used tools to explore the impact of liaison work as described in the literature are surveys or interviews that seek to understand how aware or how satisfied faculty are with library liaisons or library services. While that data has utility, it does not allow for understanding which specific liaison practices are most effective at generating positive outcomes such as increased use of the library, better instruction engagement, and stronger relationships. Assessment that forces us to find ways to measure intangible results can provide more interesting data than satisfaction, and in turn, those outcomes might lead to real library impact, such as faculty and student productivity and success, and even as MIT's mission states, "to bring knowledge to bear on the world's great challenges."[6]

lisah@mit.edu, crummett@mit.edu, tag@mit.edu

Endnotes

1. Janice M. Jaguszewski and Karen Williams, *New Roles for New Times: Transforming Liaison Roles in Research Libraries* (Washington, DC: ARL, 2013), accessed September 28, 2016, http://www.arl.org/storage/documents/publications/nrnt-liaison-roles-revised.pdf.

2. "Balanced Scorecard Basics," Balanced Scorecard Institute Strategy Management Group, accessed August 15, 2016, http://balancedscorecard.org/Resources/About-the-Balanced-Scorecard.

3. "Assessment in the MIT Libraries: 2011 Library Survey," MIT Libraries, accessed November 18, 2016, http://libguides.mit.edu/assessment/2011librarysurvey.

4. From the New Faculty Survey: How important are these services to your research or teaching activities? (Did not ask for a rating for each service). From the 2011 MIT Libraries Survey: How important is each [of the following LIBRARY SERVICES] for your research or coursework? (Listed each service and asked for a rating for each).

5. Institute Task Force on the Future of Libraries," MIT Ad Hoc Task Force on the Future

of Libraries, last modified 2016, accessed November 17, 2016, https://www.pubpub.org/pub/future-of-libraries.

6. "About MIT," accessed November 17, 2016, http://www.mit.edu/aboutmit/.

Appendix A: New Faculty Contact Worksheet

New Faculty Contact Worksheet

To be filled out for each new faculty member

Faculty Member Name: _____

Liaison Name: _____

Month of Initial Contact: _____

Have you had contact with this new faculty member? Yes: _____ No: _____

Notes:

Did you receive a reply from the faculty member? Yes: _____ No: _____

(if applicable)

If they didn't reply to your first contact, did you follow-up?
Yes: _____ No: _____

Did you hold an in-person meeting? Yes: _____ No: _____

Did you follow-up to provide the new faculty member additional information (i.e., either after the meeting or after the initial e-mail contact if no meeting was held)?
Yes: _____ No: _____

Did you take some action to learn about the faculty member during this process?
Yes: _____ No: _____

Appendix B: Liaison Follow up Worksheet

Administered six months after the end of the academic year in which initial contact was made with the faculty member.

Questions:

- Faculty member name
- Has this faculty member contacted you since your initial contact?
- If applicable, please list any new courses in which you are engaged as a result of your work with this faculty member.
- Based on your knowledge of and contact with this faculty member, have you advocated for any new library services or changes to existing services? If yes, please describe.
- Have you made any collection development recommendations or decisions as a result of what you learned about this new faculty member?
- How would you describe the relationship you have with this faculty member now?
- Please note: We recognize that it's not necessary to create an in-depth relationship with every faculty member, but are interested in understanding the nature of the relationships we are forming with our communities. Do you feel you have an ongoing, reciprocal relationship with this faculty member at this point?

Appendix C: New Faculty Survey

The MIT Libraries offer many services, such as course reserves, access to electronic articles, book delivery, etc.

1. Have you used any MIT Libraries services for research or teaching support since your faculty appointment?

    Yes/No

2. How important are these services to your research or teaching activities?

    Not Important

    Somewhat Important

    Very Important

    Essential

    No Opinion

3. Have you recommended any MIT Libraries' services to students?

    Yes/No

    Notes

Calculating the REACH of Engaged Librarians: A Lesson in Poka-Yoke Error Proofing

Sarah Anne Murphy
The Ohio State University, USA

Abstract

Purpose: Consistent capture and recording of data facilitates analysis saves individuals tasked with assessment a considerable amount of time and frustration. This paper illustrates the application of poka-yoke principles to the design of The Ohio State University Libraries' REACH database, a system used to centrally gather the instructional and programming activities of the university's liaison librarians and determine the success of the libraries' engaged librarian initiative. Poka-yoke is a Japanese term for error proofing and is a concept applied in LEAN manufacturing to ensure that a process or procedure cannot be performed incorrectly. Applied in the service sector, poka-yoke functions to make a "product or process resistant to factors beyond its control."[1]

Design/Methodology/Approaches: The REACH database uses branching logic to collect data related to four essential engaged librarian activities: credit course instruction, where a librarian is the instructor of record for a full semester; course-related instruction, where a librarian is invited to give a guest lecture for a class; library-sponsored programs and workshops; and library orientations or tours not affiliated with a specific Ohio State class. To achieve poka-yoke, the assessment librarian engaged database stakeholders early in the design process to reduce librarian reporting burden by first identifying ways to simplify the data collection form and then identifying mechanisms to join existing university systems, such as the master schedule of classes, to the database.

Findings: Each class taught at the university is assigned a unique five-digit class code. Poka-yoke was achieved by requiring librarians to enter the five-digit class code when recording credit course and course-related instructional activities. The REACH database not only simplifies, but also facilitates more accurate and robust reporting, as librarians no longer need to input information such as the approximate number of students enrolled in a course or the primary instructor of record for a course. This information may now be pulled directly from other information systems on campus and joined with the database. Reporting burden has also lessened as poka-yoke allowed university libraries to aggressively simplify its data input forms from approximately 45 fields to five to fourteen fields depending on the activity selected.

Value and Impact: Ohio State's engaged librarians have several diverse responsibilities and are frequently pulled in many opposing directions throughout their day. This means recording data regarding their daily activities is often a challenge and an afterthought. The application of poka-yoke principles has yielded a twofold benefit for this project, by reducing librarian's reporting burden and by improving the accuracy and quality of the data collected.

Purpose

Anyone who regularly works with library instruction and engagement data understands that data is inherently messy and that a data collection system is only as strong as the integrity of its inputs. Opportunities to inconsistently interpret data collection fields and incorrectly enter data persist, even after library faculty and staff collaboratively establish definitions for these fields, receive training on the system, and practice entering data into the system for over a year. These inconsistencies cost individuals tasked with assessment a considerable amount of time and frustration as data must be cleaned and the intent of individuals entering data must be confirmed before analysis can begin.

To facilitate the consistent capture and recording of library instruction and engagement data, and thus analysis, The Ohio State University Libraries applied poka-yoke principles to the design of the REACH database, a locally established system used to centrally gather the instructional and programming activities of liaison librarians and determine the

success of the libraries' engaged librarian initiative.[2] Poka-yoke is a Japanese term for error proofing and is a concept applied in LEAN manufacturing to ensure that a process or procedure cannot be performed incorrectly. Applied in the service sector, poka-yoke functions to make a "product or process resistant to factors beyond its control."[3]

Poka-yoke is achieved in several ways. For example, if a machine must be manually calibrated to produce a specific output, a company may require the equipment operator to calibrate the machine using a specific part or sequence of steps. This will allow the machine operator to quickly and accurately reset the machine. An inaccurately reset machine will automatically shut down to prevent an error—whether minor or catastrophic—from occurring. We regularly encounter poka-yoke in our daily lives as engineers design products to keep us safe. If you fail to place your car in park before turning your car off, you will not be able to take your key out of the ignition. When you turn on the self-cleaning feature of an oven, it will lock. Poka-yoke principles not only error-proof systems, they also improve the quality of work output, and reduce the time wasted on reworking, rejecting, or replacing incorrectly manufactured products.

Poka-yoke principles in the service sector can both improve customer satisfaction and customer interactions by minimizing errors made by both service providers as well as customers. Poka-yoke fail-safes may be applied both prior to and after a service encounter, addressing potential errors in performing a task, the treatment of the customer, or the tangible elements of the service.[4] In a library environment, tangible elements of a service might include providing quiet study spaces, or an appropriate number of group study rooms for students to reserve during peak hours. When a fine approval process is inconsistently managed, a task error may occur. Another library task error might occur when an interlibrary loan request for an online journal article that is already owned by the library is not promptly denied or is denied without providing the patron a direct link to the available content. Correctly handling the ILL process saves both the library money and the patron time. Treatment errors happen when interactions between library staff and patrons break down. Failure to respectfully de-escalate conflict with an angry patron represents one treatment error libraries may address by training staff. Such training may be provided using a combination of scripts and other cues, to help library staff better discuss sensitive topics with patrons and avoid miscommunication.

Chase and Stewart note that "while the 'customer is always right,' he or she is also frequently error-prone." Errors occur when customers fail to adequately prepare ahead of time for the service encounter; during the encounter, because of "inattention, misunderstanding, or simply a memory lapse"; and following the encounter, when evaluating their experience and providing feedback.[5] Reference librarians coach students to forward a copy of their syllabus, an assignment, and any research already completed prior to a consultation to proactively address preparation errors. Having possession of this information before an appointment allows a librarian to research the topic and adjust the reference interview. A prepared librarian is better positioned to assist the patron with un-surfacing the information he or she will need to complete a project. Encounter poka-yokes include everything from the buzzing sound that reminds retail consumers to remove their credit card from a chip reader, to phone menus that use branching logic to ask customers a series of questions and then forward them to the service provider who is best equipped to handle their transaction. University libraries train circulation employees to request a university e-mail address and other information when a driver's license rather than an official university-issued ID is used to check out books. This training ensures that the correct patron record is used for the transaction. Post encounter, or resolution poka-yokes in libraries include systems to promptly and properly acknowledge donors, solicit feedback, and follow up on feedback provided.

Design/Methodology/Approaches

The REACH database represents university libraries' second attempt to record library liaisons' instructional and programming activities. It succeeded the TEACH database and the PROGRAM database, two independent systems the libraries introduced in July 2012 and January 2013 respectively. The TEACH and PROGRAM databases were intended to simplify the gathering of ARL and AAHSL instructional statistics across the institution and also collect data that administrators anticipated would inform the libraries' engagement activities (Appendix A and B). TEACH asked librarians and staff to answer a series of 31 open- and closed-ended questions for five defined instructional activities: course-related instruction, credit courses, online learning object or programs, orientation or tours,

and workshops (Table 1). PROGRAM captured information documenting programs, exhibits, and non-instructional tours planned and given by library employees. This system included fourteen questions ranging from the number of program attendees or tour participants to whether a program supported one of the libraries' vision statements and the university's "Excellence to Eminence" values or "Discovery Themes."[6]

Table 1. Definitions of activity types listed in TEACH and PROGRAM databases

Database	Type of Activity	Definition
TEACH	Course-related instruction session	• One-time bibliographic instruction sessions for credit courses taught by others • Assignment-based instruction sessions
TEACH	Credit course	• Entire course for which the librarian is the instructor of record
TEACH	Online learning object or program	• Established instructional content or assignments that can be repeatedly used in courses. (e.g., NetTutor online tutorials or Make the Leap program)
TEACH	Orientation/Tour	• Examples: first-year or international student orientations to library resources, tours in the Thompson library, sessions for new graduate students in a specific discipline
TEACH	Workshop (continuing education)	• Session that was developed for a group (internal to OSU or external), but is not related to a credit course offering. (e.g., Refworks Basics Workshop)
PROGRAM	Program	• Independent library program not associated with a specific class
PROGRAM	Exhibit	• Library sponsored exhibit or display
PROGRAM	Tour	• Library tours not associated with a specific class

By October 2013, it was clear that confusion over where and how to record data persisted among library faculty and staff and that streamlined reporting was needed to improve the quality of the data collected. The libraries' assessment coordinator, in partnership with the head of the teaching and learning department, designed an assessment project with the intent to simplify and align reporting requirements by redesigning the TEACH and PROGRAM databases. After obtaining sponsorship from the associate director for research and education for the project, volunteers were recruited from the libraries' teaching and learning committee to serve on the redesign team, along with a representative from the libraries' IT department. Team members were asked to:

- Identify reporting requirements and questions of interest
- Identify opportunities to leverage pre-existing university data
- Determine mechanisms to combine TEACH and PROGRAM database fields
- Develop a prototype for a revised data collection mechanism
- Solicit feedback from the teaching and learning committee
- Revise the prototype and work with IT to identify the best platform for the database
- Share the redesigned TEACH and PROGRAM database with faculty and staff and solicit feedback
- Incorporate feedback and suggestions into the redesign

- Launch the redesigned database

The team reviewed each field in the TEACH and PROGRAM database installations, and quickly recognized an opportunity to apply poka-yoke principles to the project. Data input into several TEACH and PROGRAM database fields was either not used for analysis, or could be sourced more consistently and accurately from other central university systems. Some data, such as instructional focus of a session, was determined to be more effectively gathered and followed up on using other techniques, such as curriculum mapping. The team also questioned whether requiring data be input for online learning objects and programs constituted double reporting, since these numbers were often pulled from systems such as Google Analytics and then re-entered into TEACH. Since library faculty and staff functioned both as service providers and as internal customers of these tools, several task, encounter, and preparation errors could be addressed during the project.

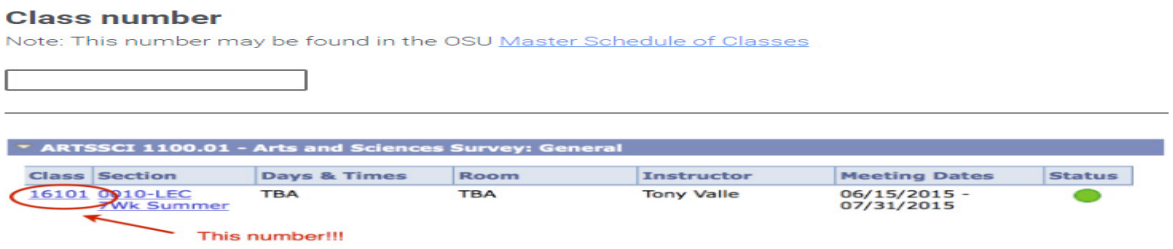
Through discussion, and the design of multiple prototypes, the team addressed task and encounter errors by reducing the number of activity types librarians and staff were asked to provide data for in both database systems from eight to four:

- Credit course
- Course-related instruction session
- Library program or workshop
- Orientation or tour

This change could improve consistency of reporting by combining fields and reducing the granularity of definitions for activity type. The team then further explored reducing task errors and simplifying data collection using branching logic. Branching logic directs flow through a survey or other data collection system based on how a respondent answers a question. Many of the questions in the original TEACH and PROGRAM databases were not relevant for all activity types. Several fields did not require a response. By not requiring information for select activity types, such as a credit course number for course-related instruction, data could be missing, or entered incorrectly, compromising analysis. Incorrectly input data was particularly an issue after the university changed its course numbering system from three digits to four following a quarter to semester conversion project. By applying branching logic to the redesigned database, librarians and staff would only view those questions that were relevant for the selected activity type. Branching logic offered designers the opportunity to further reduce their reporting burden, as well as establish required fields as appropriate for each activity type.

The team noted an additional opportunity to reduce task errors occurring when credit course and course-related instruction sessions data was collected after recognizing that data for questions such as the number of learners, or whether the course was a distance learning, freshman seminar, or honors course could be harvested from existing university systems. Each course section at the university has a uniquely assigned class number that is listed in the master schedule of classes.[7] If the redesigned database required librarians and staff to provide the unique five-digit class code for credit course and course-related instruction sessions, instead of the course number, the libraries would be able to centrally pull elements such as the name of the primary instructor of record for a course, and join this information to the data entered by a library employee (Figure 2). Having this information would further reduce reporting burden, as librarians and staff would then only need to provide data for five to seven fields, rather than 31, depending on whether the credit course or course-related instruction activity type was selected.

Figure 2. Example of class number for Arts and Sciences 1100.01, a freshman survey class with several sections taught by various instructors each semester

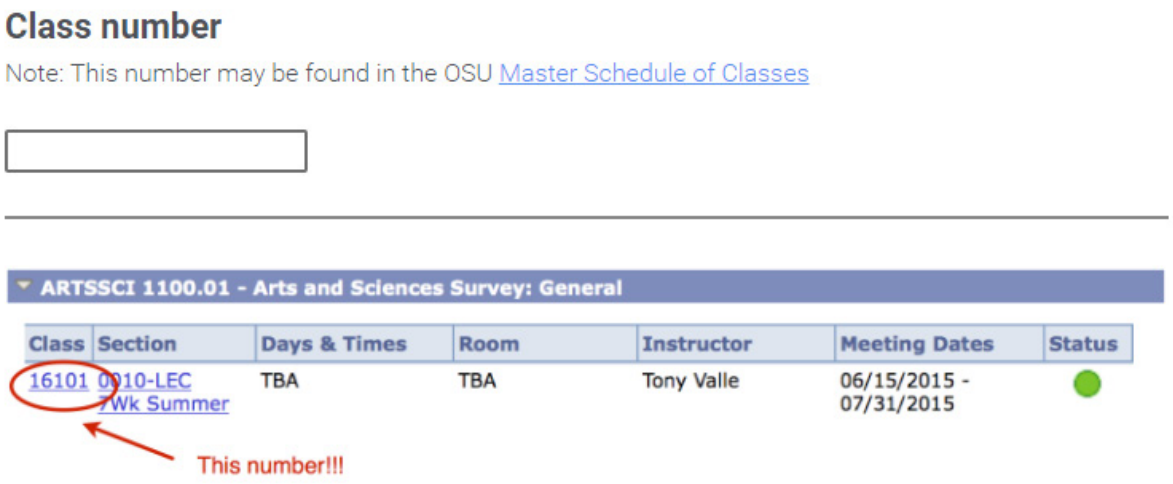


Once the team finished gathering requirements and testing prototypes, it worked with the libraries' IT department to determine whether existing platforms could be used to host the revised database, or if programmer time was needed to implement the team's vision. IT suggested using a Qualtrics survey to gather the data, since Qualtrics offers branching logic and the ability to export data in .csv format. The assessment coordinator could then harvest the collected data quarterly and combine it with relevant data hosted in other central university systems using Access, Tableau, and other tools. The project team accepted this solution, and recommended the revised database be renamed REACH, to reflect that the data gathered was intended to help the libraries articulate the impact of its instructional and programming outreach across the campus. The assessment coordinator then set up the survey and created a Tableau dashboard to summarize and push the raw data back to librarians and staff[8] (Appendix C).

Findings

The REACH database achieved poka-yoke using several techniques, such as simplifying the data collection instrument and requiring librarians and staff to enter the five-digit class code when recording credit course and course-related instructional activities. The redesign addressed several task, preparation, and encounter errors that occurred when librarians and staff input data into the previous two systems. As REACH was configured in Qualtrics, additional fail-safes, such as adding a direct link to the university's master schedule of classes to the field requesting a class number, were identified per the suggestion of the project team. A screen shot showing which number to enter in this field was also added and the assessment coordinator set Qualtrics to both force a response and require exactly five characters for the class number field (Figure 3). These three actions not only addressed task and preparation errors that occurred when using the previous data gathering systems, but nearly eliminated the need to clean data before analysis.

Figure 3. Qualtrics survey question for class number, with direct link to the master schedule of classes and a screen shot showing the number librarians and staff need to enter into this field



REACH now facilitates more accurate and robust reporting. Librarians and staff no longer need to guestimate the number of students enrolled in a class, as this number is now harvested from other central university systems. Critical information about an instructional session may no longer be omitted or errantly input. This saves the assessment coordinator valuable time by virtually eliminating the need to clean data. Using poka-yoke, the project team significantly reduced reporting burden, by aggressively simplifying its data-input form from 45 to five to fourteen fields, depending on the activity type selected.

Value and Impact

Ohio State's engaged librarians have several diverse responsibilities and are frequently pulled in many opposing directions throughout the course of their work. Recording data regarding their daily activities is often a challenge and an afterthought. Poka-yoke offers the assessment community several principles and techniques for improving the quality

and accuracy of data collected from librarians and staff. Poka-yoke applied to data collection systems facilitates analysis and may help libraries better articulate their impact. Poka-yoke also has the potential to improve the experience of individuals tasked with collecting library data, by simplifying their data entry experience and reducing their reporting burden.

Poka-yoke principles and techniques may be applied to any library system or service. By introducing fail-safes to product or service design, much frustration can be avoided and a better quality product or result may be achieved. Poka-yoke applied to data gathering systems in particular can effectively address data input errors, facilitate downstream analysis, and improve reporting. While "designing poka-yokes is part art and part science," the time required to investigate and address both service and customer errors is a valuable investment.[9]

Notes

1. Richard B. Chase and Douglas M. Stewart, "Make Your Service Fail-Safe," *MIT Sloan Management Review 35*, no.3 (April 15, 1994), http://sloanreview.mit.edu/article/make-your-service-failsafe/.

2. The Ohio State University Libraries, "A Framework for Engaged Librarianship: Building on Our Strengths," accessed September 21, 2016, https://carmenwiki.osu.edu/download/attachments/37010332/Engaged+Librarian+Document.pdf?version=1&modificationDate=1362663472574.

3. Chase and Stewart, "Make Your Service Fail-Safe."

4. Ibid.

5. Ibid.

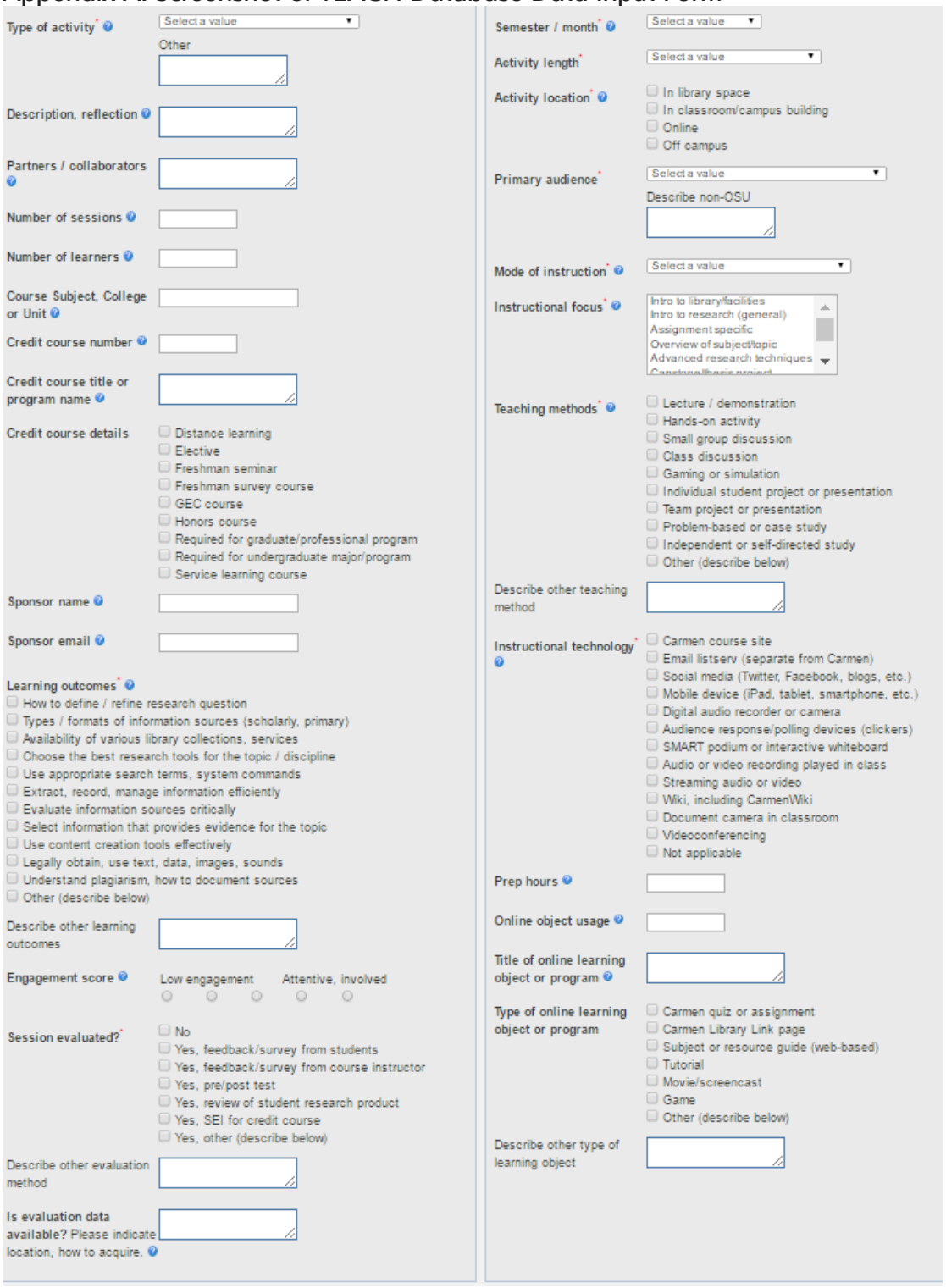
6. The Ohio State University, "Ohio State Vision, Mission, Values, and Goals," accessed September 21, 2016, http://oaa.osu.edu/vision-mission-values-goals.html; The Ohio State University, "Discovery Themes," accessed September 21, 2016, http://discovery.osu.edu/.

7. The Ohio State University, "Master Schedule of Classes," accessed September 21, 2016, https://courses.osu.edu/psp/csosuct/EMPLOYEE/PUB/c/COMMUNITY_ACCESS.CLASS_SEARCH.GBL.

8. The Ohio State University Libraries, "REACH Database," accessed September 21, 2016, http://go.osu.edu/REACH-Dashboard.

9. Chase and Stewart, "Make Your Service Fail-Safe."

Appendix A. Screenshot of TEACH Database Data Input Form



Type of activity* Select a value
Other
Description, reflection
Partners / collaborators
Number of sessions
Number of learners
Course Subject, College or Unit
Credit course number
Credit course title or program name
Credit course details
- Distance learning
- Elective
- Freshman seminar
- Freshman survey course
- GEC course
- Honors course
- Required for graduate/professional program
- Required for undergraduate major/program
- Service learning course

Sponsor name
Sponsor email

Learning outcomes*
- How to define / refine research question
- Types / formats of information sources (scholarly, primary)
- Availability of various library collections, services
- Choose the best research tools for the topic / discipline
- Use appropriate search terms, system commands
- Extract, record, manage information efficiently
- Evaluate information sources critically
- Select information that provides evidence for the topic
- Use content creation tools effectively
- Legally obtain, use text, data, images, sounds
- Understand plagiarism, how to document sources
- Other (describe below)

Describe other learning outcomes
Engagement score — Low engagement … Attentive, involved
Session evaluated?*
- No
- Yes, feedback/survey from students
- Yes, feedback/survey from course instructor
- Yes, pre/post test
- Yes, review of student research product
- Yes, SEI for credit course
- Yes, other (describe below)

Describe other evaluation method
Is evaluation data available? Please indicate location, how to acquire.

Semester / month* Select a value
Activity length* Select a value
Activity location*
- In library space
- In classroom/campus building
- Online
- Off campus

Primary audience* Select a value
Describe non-OSU
Mode of instruction* Select a value
Instructional focus*
- Intro to library/facilities
- Intro to research (general)
- Assignment specific
- Overview of subject/topic
- Advanced research techniques

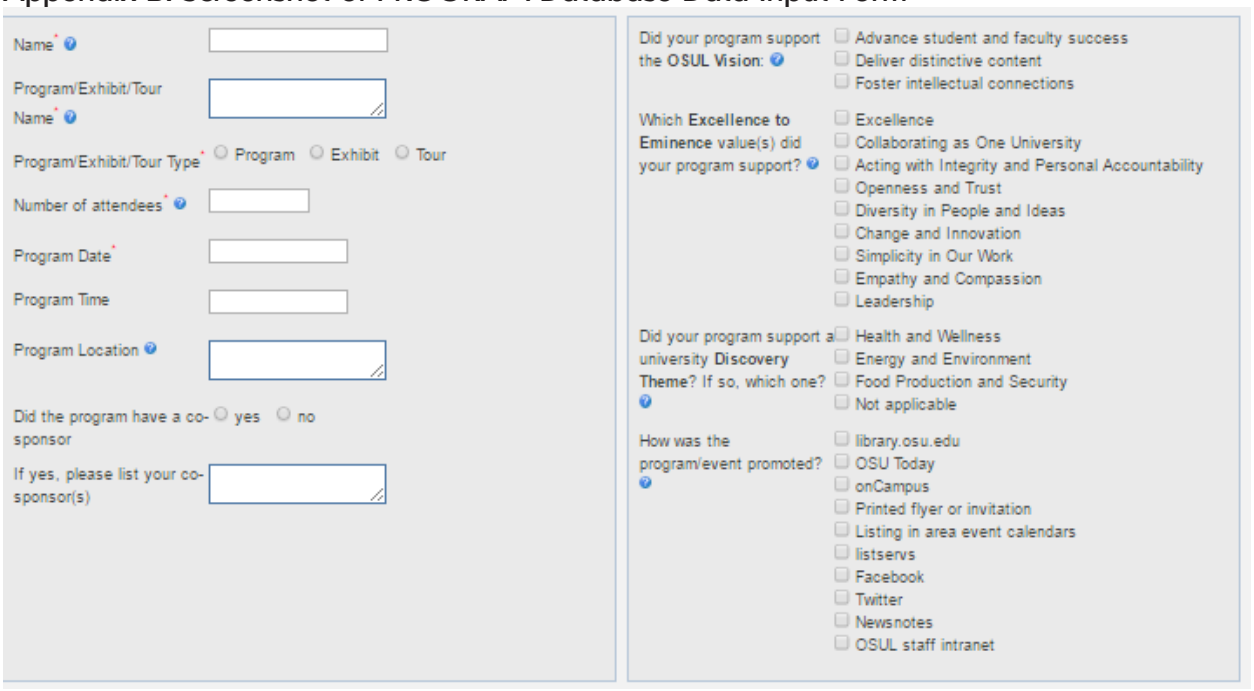
Teaching methods*
- Lecture / demonstration
- Hands-on activity
- Small group discussion
- Class discussion
- Gaming or simulation
- Individual student project or presentation
- Team project or presentation
- Problem-based or case study
- Independent or self-directed study
- Other (describe below)

Describe other teaching method
Instructional technology*
- Carmen course site
- Email listserv (separate from Carmen)
- Social media (Twitter, Facebook, blogs, etc.)
- Mobile device (iPad, tablet, smartphone, etc.)
- Digital audio recorder or camera
- Audience response/polling devices (clickers)
- SMART podium or interactive whiteboard
- Audio or video recording played in class
- Streaming audio or video
- Wiki, including CarmenWiki
- Document camera in classroom
- Videoconferencing
- Not applicable

Prep hours
Online object usage
Title of online learning object or program
Type of online learning object or program
- Carmen quiz or assignment
- Carmen Library Link page
- Subject or resource guide (web-based)
- Tutorial
- Movie/screencast
- Game
- Other (describe below)

Describe other type of learning object

Appendix B. Screenshot of PROGRAM Database Data Input Form



Name*

Program/Exhibit/Tour Name*

Program/Exhibit/Tour Type* ○ Program ○ Exhibit ○ Tour

Number of attendees*

Program Date*

Program Time

Program Location

Did the program have a co-sponsor ○ yes ○ no

If yes, please list your co-sponsor(s)

Did your program support the **OSUL Vision**:
- ☐ Advance student and faculty success
- ☐ Deliver distinctive content
- ☐ Foster intellectual connections

Which **Excellence to Eminence** value(s) did your program support?
- ☐ Excellence
- ☐ Collaborating as One University
- ☐ Acting with Integrity and Personal Accountability
- ☐ Openness and Trust
- ☐ Diversity in People and Ideas
- ☐ Change and Innovation
- ☐ Simplicity in Our Work
- ☐ Empathy and Compassion
- ☐ Leadership

Did your program support a university **Discovery Theme**? If so, which one?
- ☐ Health and Wellness
- ☐ Energy and Environment
- ☐ Food Production and Security
- ☐ Not applicable

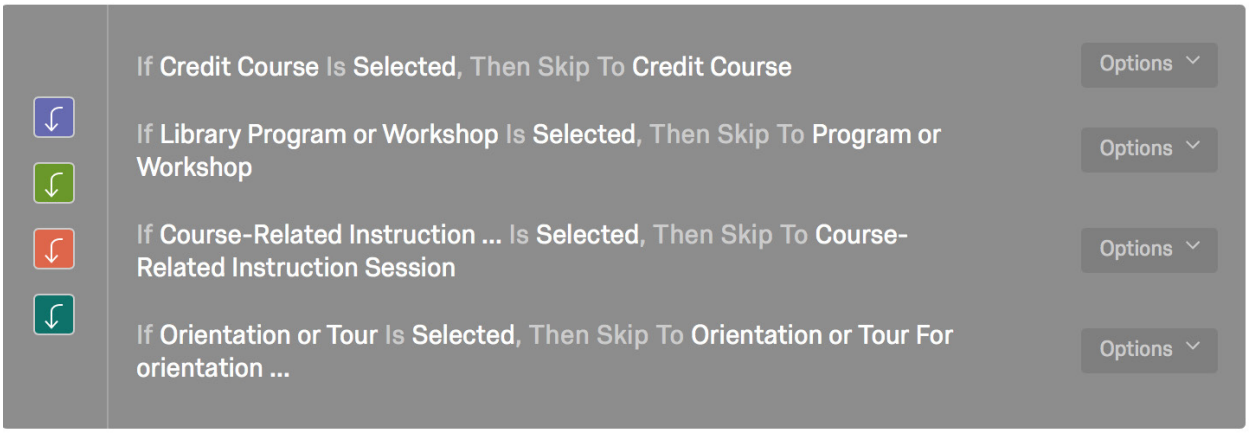
How was the program/event promoted?
- ☐ library.osu.edu
- ☐ OSU Today
- ☐ onCampus
- ☐ Printed flyer or invitation
- ☐ Listing in area event calendars
- ☐ listservs
- ☐ Facebook
- ☐ Twitter
- ☐ Newsnotes
- ☐ OSUL staff intranet

Appendix C. REACH Database

1. Your OSU email address
Such as name.12345@osu.edu

2 Select one

- Credit Course
- Course-Related Instruction Session
- Library Program or Workshop
- Orientation or Tour

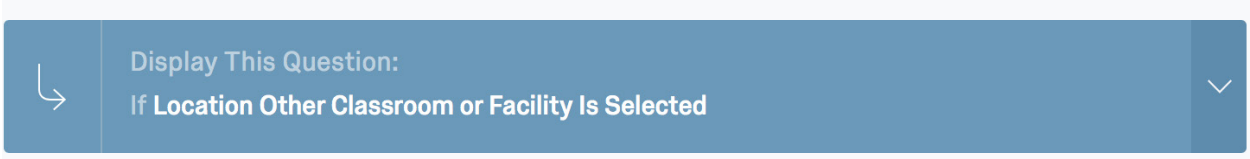


Credit Course
1. Class number

This number may be found in the OSU Master Schedule of Classes. For four-digit class numbers, insert a '0' before the first number (e.g., 1234 = 01234).

2. Location

Displays a list of library classrooms. This list also includes Online, as well as Other Classroom or Facility as options.



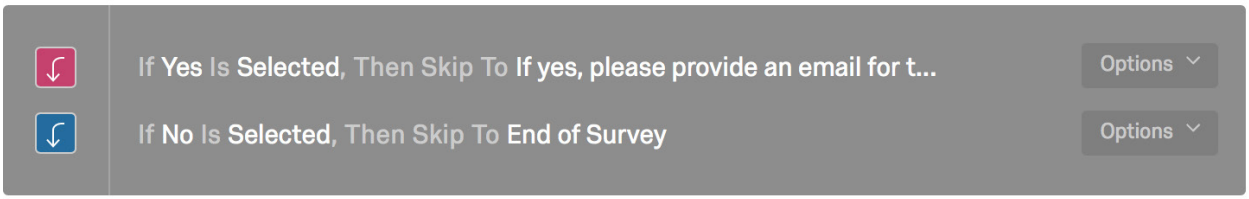
3. If other, where was this activity taught?

Please list the building and room number.

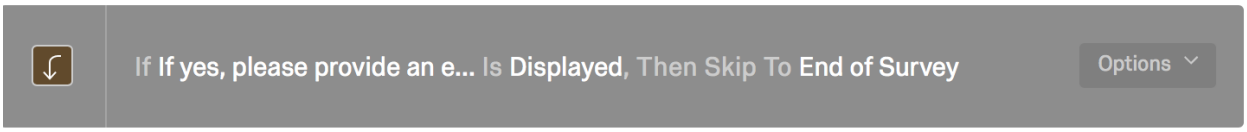
4. Did you co-teach this activity with another library employee?

Please submit only one record per co-taught activity

- Yes
- No



5. If yes, please provide an email for the individual you co-taught this activity with?



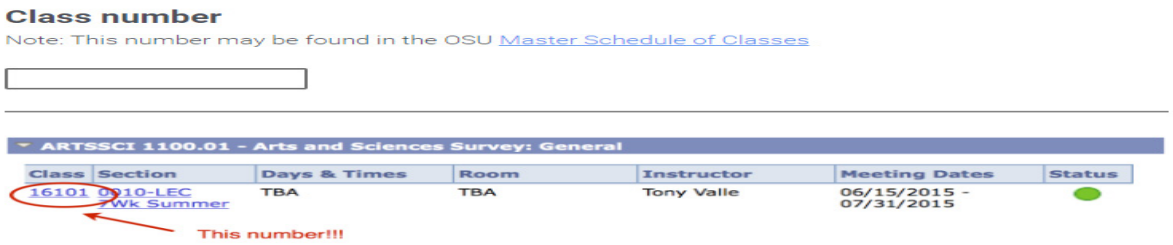
Course-Related Instruction Session
1. Date of instruction session

mm/dd/yyyy

If multiple sessions were taught, please provide one entry for each session. If you were an official instructor for the course, please stop and use the credit course section of the database to record your information.

2. Class number

This number may be found in the OSU Master Schedule of Classes. For four-digit class numbers, insert a '0' before the first number (e.g. 1234 = 01234).

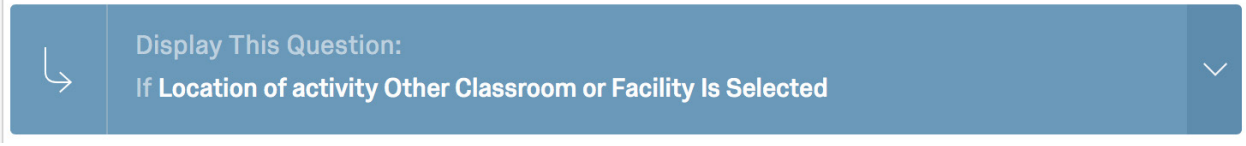


3. Length

- 25% of the class session
- 50% of the class session
- 75% of the class session
- 100% of the class session

4. Location of the activity

Displays a list of library classrooms. This list also includes Online, as well as Other Classroom or Facility as options.



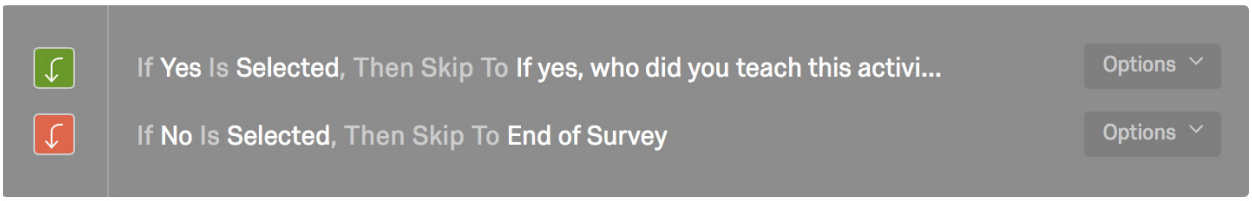
5. If other, where was this activity taught?

(Please list the building and room number)

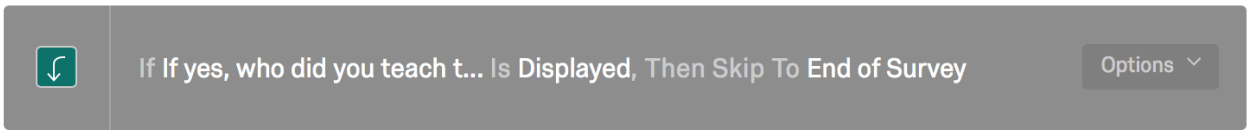
6. Did you co-teach this activity with another library employee?

Please submit only one record per co-taught activity

- Yes
- No



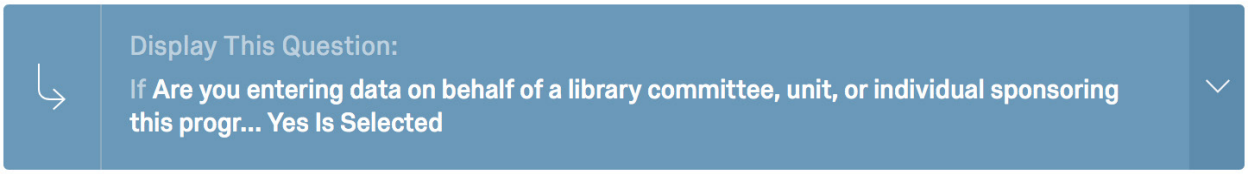
7. If yes, who did you teach this activity with?



Program or Workshop

1. Are you entering data on behalf of a library committee, unit, or individual sponsoring this program or workshop?

- Yes
- No



2. Please enter the name of the library committee, unit, or individual who sponsored this program or workshop.

3. Title of program or workshop

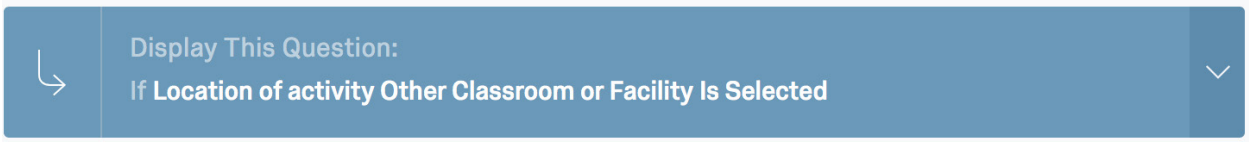
4. Date of program or workshop - mm/dd/yyyy

If a multiple day program, or event, please provide one entry for each day of the program or event

5. Number of attendees

6. Location

Displays a list of library classrooms. This list also includes Other Classroom or Facility as options.

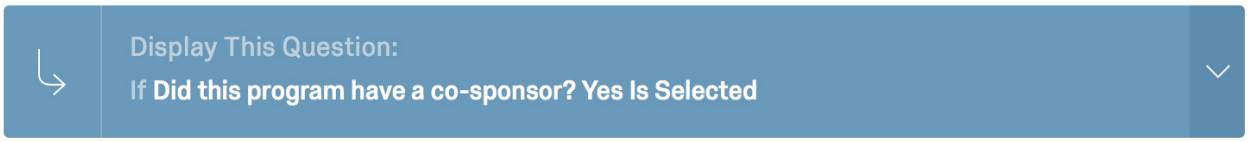


7. If other, where was this program held?

If on campus, please list the building and room number

8. Did this program have a co-sponsor?

- Yes
- No



9. If yes, please list your co-sponsors

Please place a ; between co-sponsors

10. Which Vision of University Libraries did your program support?

(Select all that apply)

- Advance student and faculty success
- Deliver distinctive content
- Foster intellectual connections

11. Which University Values did your program support?

(Select all that apply)

- Commitment to Excellence
- Collaboration as One University
- Acting with Integrity
- Personal Accountability
- Openness and Trust
- Diversity in People and Ideas
- Change and Innovation
- Simplicity in Our Supporting Processes
- x Not applicable

12. Did your program or workshop support a University Discovery Theme? If so, which one?

(Select one)

- Energy and Environment
- Food Production and Security
- Health and Wellness
- Humanities and Arts
- x Not applicable

13. Did your program or workshop support a University Discovery Theme Focus Area? If so, which one?

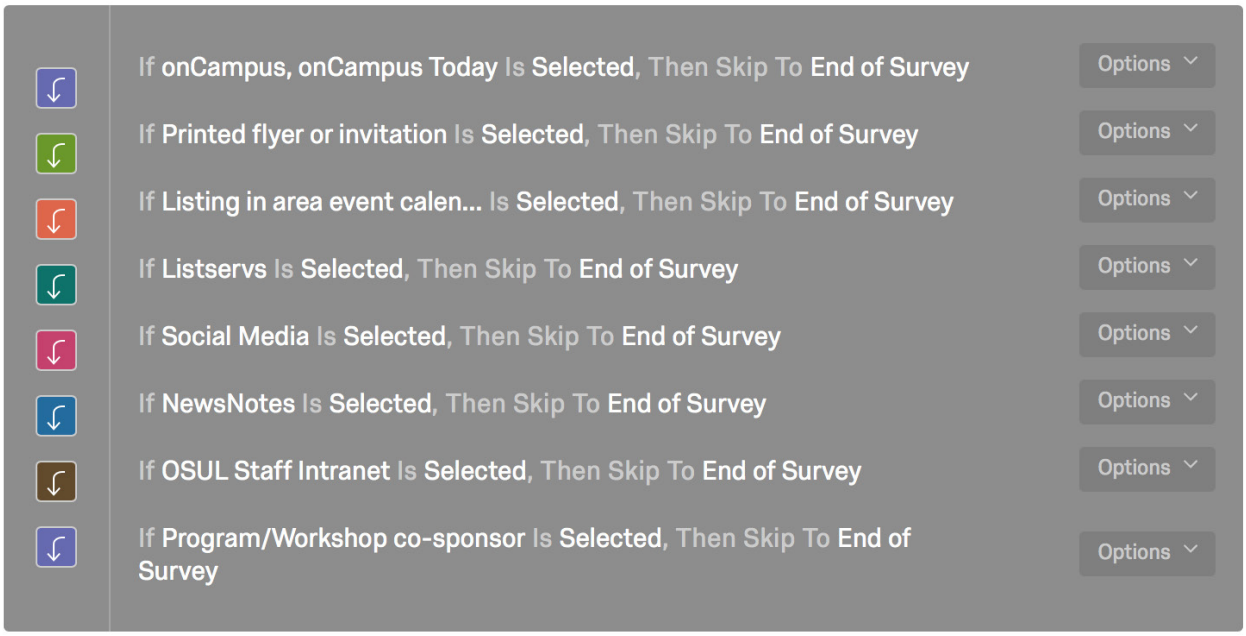
(Select one)

- Brain Injury
- Data Analytics
- Foods for Health
- Food and Agricultural Transformation
- The Humanities and the Arts
- Infectious Diseases
- Materials and Manufacturing for Sustainability
- Sustainable Materials and Resilient Economy

14. How was this program or workshop promoted?

(Select all that apply)

- OnCampus, OnCampus Today
- Printed flyer or invitation
- Library website
- Listing in area event calendars
- Listservs
- NewsNotes
- OSUL Staff Intranet
- Program/Workshop co-sponsor
- Social media



Orientation or Tour
For orientation or tours for general groups (e.g., orientation for new graduate students in the College of Veterinary Medicine or International Student Orientation). If you give a tour for a specific class, please record this tour under one-shot instruction.

1. Date of orientation or tour

mm/dd/yyyy

2. Name of individual or group requesting orientation or tour

3. Please provide an email for the primary individual or group who requested the orientation or tour.

4. Primary audience

- OSU Undergraduate
- OSU Graduate
- OSU Faculty/Staff
- Non-OSU

5. Number of participants

6. Location of orientation or tour

Displays a list of all OSU library locations.

Display This Question:
If **Location of orientation or tour Other location Is Selected**

7. Please note the location of the orientation or tour

8. Length of orientation or tour

- Less than 30 minutes
- 31 to 60 minutes
- more than 60 minutes

ARL's Leadership and Career Development Program: An Incubator and Catalyst for Leadership Development

Carlette Washington-Hoagland
University of Iowa, USA

Mark A. Puente
Association of Research Libraries, USA

Abstract

For many years, library literature has been predicting a mass exodus of positional leaders from the library and information science (LIS) workforce as a product of age demographics and impending retirements. Furthermore, the seemingly intractable problem of the lack of diversity in the LIS workforce has resulted in numerous programs and strategies that aim to increase the number of individuals from historically underrepresented or marginalized populations in the professional workforce. Most of these efforts, however, have focused on entry-level professionals and increasing the number of diverse individuals within professional ranks of the workforce. The Association of Research Libraries (ARL) Leadership and Career Development Program (LCDP), established in 1997, has been unique in its approach since its inception in that it has focused on mid- to late-career LIS professionals from historically underrepresented groups. In its earliest years, the goal of the LCDP was to develop and encourage these professionals to consider pursuing leadership (director) roles in ARL member libraries. Later program iterations focused on mid-career professionals and on the development of leadership skills across multiple dimensions with additional focus on areas of strategic importance for the Association.

In October 2014, ARL initiated a comprehensive, longitudinal assessment of the LCDP with the goal of ascertaining the effect of the program on its participants and on the research library community. This yearlong process involved determining and evaluating multiple scales—using both quantitative and qualitative data—as indicators of the efficacy of the training methodology and the perceived impact of the experience on former participants. This paper describes the principle drivers behind the assessment as well as the methodology used to measure the program's success. The results of the assessment will help to inform the design of future iterations of the LCDP, and will provide a framework by which other leadership development trainings can be developed and assessed. Historically, assessing the effect of leadership development training in any context has been difficult at best. The LCDP assessment offers a systematic approach to measuring the efficacy of specific program components in spite of design changes to the program made through the history of the program. Moreover, the instrument allows for a comprehensive assessment of the program based on perceptions about the experience, as well as external factors.

Introduction

Program History

The history of the ARL's Leadership and Career Development Program (LCDP) extends nearly two decades. The program began as a yearlong pilot project in 1997, funded by a grant award from the US Department of Education (Higher Education Act Title II-B) and the Institute for Museum and Library Services (IMLS). The pilot project was highly successful and garnered association-wide support; membership dues were slightly increased to partially fund the continuance of the program. As a result, the LCDP was officially added to ARL's cadre of diversity programs and resources the following year.

Over the years, the program has continued to evolve to keep pace with the changing demands and expectations of library users, the landscape of higher education, and changing strategic priorities of the Association. Modifications were made to both program goals and structure based on feedback from fellows and supporters of the program (i.e.,

the program selection committee, speakers, ARL Diversity Committee members, library directors who supported participants from their home institution, and mentors). In 2007, a number of modifications were made to the program design: (a) the timeline was extended from one year to 18 months; (b) instructional components were broadened to provide opportunity for meaningful exposure to and experience with the strategic issues shaping the future of research libraries; and (c) the mentoring component was expanded to include a personalized site visit to an ARL institution.

Current Program Components

Initially, the goal of the LCDP was to prepare more senior librarians from traditionally underrepresented racial and ethnic minority groups to take on top-level roles in ARL libraries. Today, the program continues as a leadership incubator or catalyst designed to prepare mid-career librarians from culturally diverse backgrounds to serve increasingly diverse learning communities in libraries. The latest iterations (2011 and 2013) of the LCDP contained the following core components:

1. Orientation: Introduction to the program, cohort building, self-evaluation, and personal career planning
2. Two multi-day institutes
    a. Training on identifying, developing, and conducting research
    b. Major strategic issues currently shaping the future of research libraries
3. Career-coaching relationship: each fellow is paired with an ARL library director or a senior staff member
4. Supplemental support: online discussions and webinars related to the ARL strategic directions
5. Site visit to career coach home institution: opportunity to see firsthand the inner workings of a complex organization
6. Closing event and poster session: opportunity to share research findings with library directors, senior staff members and the broader ARL community

The program was designed to provide a diverse set of developmental experiences and opportunities for participants: mentoring by leaders in the profession; pursuit of a research project and the opportunity to present and/or publish the results; increased visibility in the profession; and a cohort of supporters invested in the future success of their classmates. Over the last 18 years, ARL has graduated 150 LCDP fellows.

Drivers for and Goals of the Study

This assessment of the LCDP is part of a more comprehensive review of all ARL diversity programs and their impact on the Association's diversity recruitment and leadership development efforts. This is the third overall assessment of the LCDP: 1998, 2007, and 2015. The goals of this project were:

1. To assess graduates' overall perception of the program
2. To assess the overall impact of the program on graduates' career development over time

Success Indicators

1. Long lasting professional and personal relationships
2. Access to a range of career development resources
3. Development of individual leadership attributes and methods for their implementation
4. A growing pool of racially diverse librarians prepared and challenged to take on new leadership roles in research libraries

A timeline was created for the project that details the steps in the development and implementation of the assessment and is provided in Appendix A. LCDP graduates were invited to participate and given two weeks to respond to the survey. A screenshot of the opening page of the survey, developed in SurveyMonkey, is provided in Appendix B. The text to the e-mail invitation to participate in the assessment is found in Appendix C. Tables containing the quantitative data (survey results) can be found in the final appendix (D).

Methodology

Study Population

The survey was distributed to the total population of 140 LCDP graduates with a loss of ten in the population due to attrition.

Distribution of LCDP graduates by cohort

Sequence	Class/Cohort	Year	# Graduates
First	Inaugural	1997–1998	21
Second	Millennial	1999–2000	18
Third	New Century	2001–2002	20
Fourth	Intentional Visionaries	2003–2004	22
	No program	2005–2006	
Fifth	Renaissance Class	2007–2008	20
Sixth	Vanguard Class	2009–2010	10
Seventh	Luminary Class	2011–2012	18
Eighth	Phoenix Class	2013–2014	21
TOTAL Number of LCDP Graduates			**150**
(Less attrition/10)			**140**

Instrument Design: Online Survey
ARL recruited a visiting program officer (VPO)—an alumnus of the LCDP—to conduct the assessment in fall of 2014. The first drafts of the survey were developed with the input from Dr. Dorothy Persson, a retired librarian at the University of Iowa with subject specialty in psychology and education. The instrument was later reviewed by Dr. Tim Ansley, associate professor and DEO of Psychological and Quantitative Foundations at the University of Iowa. The survey is composed of 30 quantitative questions and six qualitative questions, broken down into the following categories:

Operationalization of Variables
Profile of Population
- General information (Q1–Q11)
- Demographics (Q33–Q35)
- Post-graduate education (Q12–Q13)
- Professional engagement (Q23–Q29)

Overall Perception of Program
- Relevance/importance of program components and activities (Q14)
- Relevance/importance of structured learning activities (Q22)
- Relevance of career coach/mentoring relationship (Q14c; Q19–Q21)

Career Development
- Career status (Q10–Q11)
- Post-graduate education (Q12–Q13)
- Professional engagement (Q25–Q26 and Q28)

Program Impact
- Overall impact (Q15–Q16; Q30)
- Research project (Q14c; Q17–Q18)
- Program components and activities (Q14)
- Career coach/mentoring relationship (Q14d; Q19–Q21)

Pretest: Online Survey and Follow-up Discussion
The survey was pretested online by 11 LCDP graduates on June 11, 2015, followed by a focus group discussion with a subset of those program alumni held on June 27, 2015. A representative from seven (minus 2001–2002) of the eight cohorts participated in the pretest activities.

Pretest Participants

Pretest Participants	
1 representative	Inaugural, 1997–1998
1 representative	Millennial, 1999–2000
0 not represented	New Century, 2001–2002
1 representative	Visionary, 2003–2004
NA no program	2004–2005
2 representatives	Renaissance, 2007–2008
3 representatives	Vanguard, 2009–2010
2 representatives	Luminary, 2011–2012
1 representative	Phoenix, 2013–2014
11 (8 of 9 cohorts)	

Revisions were made to the survey based on feedback from the pretest. The finalized survey was distributed to 140 LCDP graduates on September 19, 2015, and closed on October 19, 2015. A total of 72 surveys was completed, representing a 51.4% response rate. Perhaps not surprising is the fact that the distribution of data is overrepresented by the more recent Vanguard (2009–10) and Phoenix (2013–14) graduates; and unrepresented by Millennial (1999–00) and New Century (2001–02) graduates. See Appendix D, Table 3.

Findings

Respondent Profile

Pre-LCDP

Eighty-one percent of the respondents learned about the LCDP via word of mouth—from past LCDP participants (30%), a library dean/director (26%), a colleague from another library or profession (25%), or e-mail/Listserv (24%). However, when asked who initially encouraged their application to the program, 31% self-nominated. Fewer were encouraged to participate in the program by their library director/dean (25%) or their supervisor (14%). See Appendix D, Tables 1–2.

When respondents applied for the fellowship, they self-identified as female (83%), black/African American (43%), Asian/Asian American (25%) or Hispanic/Latino (21%). They had 4–7 (46%) or 8–11 (32%) years of library experience in an academic library (94%) and of those, 78% were employed in ARL member libraries. While participating in the program, they held mid-career non-management (68%) or mid-career management positions (21%); fewer worked in upper management (11%) or administration (0%). See Appendix D, Tables 11, 12, 6, 7, and 5.

Although most had no postgraduate education (53%) beyond the Master of Library Science degree (MLS), 47% had completed a second master's degree (26%), a PhD (6%), graduate course work without a degree objective (15%), a certificate program (3%), or engaged in other postgraduate work (7%). Respondents were also professionally very active or active (68%) and engaged in a variety of activities for advancement—service to home institution (93%), service to professional organizations (83%), delivered presentations (85%), and produced scholarly publications (58%). However, fewer engaged in scholarly research (44%). See Appendix D, Tables 8–10.

Post-LCDP

Today, 42% of the respondents work in upper management (24%) or administration (18%); fewer respondents (36%) are in mid-career non-management (28%) or mid-career management positions (8%). They have continued to be professionally very active or active (69%) and engage in a variety of activities for advancement—service to home institution (92%), service to professional organizations (79%), deliver presentations (79%), and produce scholarly publications (54%). Interestingly, their engagement in scholarly research (44%) has remained unchanged, and low relative to all other activities. See Appendix D, Tables 7 and 9–10. Respondents fell into three categories relative to years of library experience: 8–11 (24%), 12–15 (25%) or 16+ (49%). However, 11% fewer

are employed in an ARL member library (67%) but rather, public (3%), community college (1%) or special libraries (7%). And 6% are no longer employed in a library setting. See Appendix D, Tables 4–6.

Goal 1: Perception of Program

Core Program Components and Activities

Unlike online activities (44%), respondents identified the following program components as very important or important to their overall development: (1) multi-day institutes (94%), (2) site visit (82%), (3) self-assessment (77%), (4) mentoring relationship (72%), and, to a lesser degree, the (5) research project (56%). See Appendix D, Table 14.

Program Curriculum

Overall, respondents strongly agree or agree that the curriculum was well developed (89%) and adeptly delivered (94%). The variety of learning activities (92%) and cohort structure helped them to better engage in the learning process (92%). One LDCP alumnus commented, "It was a great opportunity to connect and create relationships with academic librarians; I am renewed by their presence and perspectives, [which collectively], is of benefit to the entire cohort." Respondents noted that "[the curriculum] provided opportunities for deeper understanding; I rely often on skills and knowledge gained through the fellowship; and I still refer to my notebook." See Table 15.

Issues/Concerns

The respondents clearly viewed the mentoring relationship as a key component of the fellowship. Some notable comments include:

> [A] tremendous mentor; great learning and reflective experience; wouldn't change anything about it; excellent relationship; great mentor; always responsive; extremely pleased with [my] coach; we got along well; mentoring extremely positive—we discussed each other's expectations at the beginning of the program; mentor was great; really great career coach; my mentor was actively engaged with helping me get tenure; always responsive when I needed help; made our time together a priority; always there for me.

Conversely, some of the more notable comments were not favorable:

> My mentor was too busy to meet with me; I had almost no contact with my mentor; my mentor spent extremely little time interacting with me; mentors need to carve out time to meet on a periodic basis; ...the program organizers should ensure that both career coach and mentor have [adequate] time to commit [to] the mentoring relationship.

Only 53% of the respondents strongly agree or agree that their mentor was invested in their success, while even fewer indicated that their career coach continues to support their success (27%). Nevertheless, 54% of the respondents strongly agree or agree that their career coach provided constructive feedback and was available when needed for support (62%). See Appendix D, Table 16.

In particular, respondents indicated confusion with regard to their role in and responsibilities associated with the mentoring relationship:

> I had no idea of what to ask my mentor or what to expect from him; I tried many strategies but never had the coaching relationship I wanted or needed; I don't recall any parameters or expectations of the relationship being set. I had no idea of how to get the most out of our [career coach/ mentoring] relationship—[needed] more formal instructions or guidelines for both parties with concrete examples of ways to interact or goals to work toward.

Others recognized a need for cultural competency training: "I was the one to challenge my mentor to recognize diverse perspectives; [my] mentor needed cultural competency training."

Solutions

Respondents recommend "...periodic check-ins" with the career coach and mentee throughout the fellowship; this could expedite the identification of problems and hopefully bring about timely intervention and/or resolution that might otherwise undermine the entire fellowship experience. Others suggested the possibility of "engaging members of the cohort" in the problem-solving process. Respondents strongly agree or agree that the mentoring relationship could benefit from: (1) a facilitated workshop on the mentoring relationship (68%)—where expectations of both parties are discussed—and, (2) more structured time to interact with their career coach: more consistent interaction (59%) and more dedicated time set aside to interact

(58%). See Appendix D, Table 17. Respondents voiced a need for some assurance that the career coaches truly value diversity, and suggested the addition of content on race and gender to be added to the curriculum. Participants would also like the mentors to be more engaged in the research component of the program and to extend the curriculum to include an online intensive workshop on survey design and research methods between institutes.

Goal 2: Impact of Program

Origin of Impact and Advancement

Seventy-six percent of the respondents capitalized on their experience as fellows to advance their careers during the program (50%) or soon after (26%) they graduated. They could recount many examples of accomplishment, including, but not limited to: "A promotion; my first management position at a library; took on a more advanced position at my library; enrolled in graduate school; developed new programs; and became dean or AUL." See Appendix D, Table 21.

Forty-four percent of the respondents indicated that their research project led to opportunities that extended beyond the fellowship (i.e., formal presentations; workshops; poster sessions; scholarly publications; advance degrees, tenure, faculty collaborations; successful grant applications; promotions; new research opportunities; and a new job). See Appendix D, Table 19. Others credited their research project for "heightening their professional standing among colleagues with regard to their area of study; and that it enabled them to speak more authoritatively about emerging trends in ARL libraries." Respondents expressed appreciation for their ability to make important connections through networking—" it increased my involvement in professional associations; and it has helped me find a trajectory for my career, which may not translate into a higher level position but [rather] finding ways to lead from where I am."

Impact on the Fellow

Sixty-nine percent or more of the respondents point to certain personal experiences as a fellow to demonstrate the impact of the LDCP. For example, when asked, participants strongly agree or agree the fellowship helped: "me to step out of my comfort zone (78%); deepen my commitment to long and short term personal and professional development (78%); see life as a journey and pursue new opportunities as they arise (76%); achieve one or more of my career goals (72%); discover untapped leadership skills (71%); become more confident in my leadership ability (75%), become more confident in my ability to lead from any position in an organization (69%); become more self-aware (75%), become more reflective in the decisions I make (75%), build a useful knowledge base I can readily access at any point to facilitate my career development (69%), and to form a strong network of colleagues (76%)." One LCDP fellow summed up the experience in the aggregate by saying, "The networking opportunities have been phenomenal and access to them have proved invaluable." However, fewer respondents strongly agree or agree the fellowship helped to establish connections that helped them achieve one or more of their career goal/s (57%). See Appendix D, Table 18.

Issues and Concerns

More than half (56%) of the respondents' research projects did not lead to opportunities beyond the fellowship. See Appendix D, Table 19. When asked for an explanation, "respondents pointed to a need for additional training on how to conduct scholarly research and a dedicated support person (and/or career coach) to help navigate the research process."

Since completing the LCDP, 56% of the respondents indicated that one or more major life-changing events—an experience that changes a person's status or circumstances—had an impact on their career development. Top barriers included: relocation/ new job/transferred; marriage; divorce; birth of child/custody; death; illness (self or loved one); graduate school; and layoff. See Appendix D, Table 20. Others pointed to "significant reductions in library budgets that led to limited funding allocated to professional development." A need was expressed for greater support or more of a commitment from their sponsoring institution by way of a bridging component to facilitate the transition back to the home institution, one that takes advantage of newly acquired skills.

Final Thoughts

Overall, respondents learned transferrable skills—personal, intellectual and experiential—that they leveraged throughout their career for advancement, be it along a traditional career trajectory or at the individual level for personal development. The LCDP was an empowering experience. It provided a unique opportunity for self-reflection—the discovery, recognition, or awareness of personal strengths—the

confidence to take on more challenging leadership opportunities, and a dedicated group of colleagues invested in their success. The cohort structure was fundamental to this experience. It provided a sense of belongingness for the fellows: unquestionable acceptance, and the opportunity for motivation and renewal through sharing experiences and working through issues. Even though some respondents questioned the mentors' commitment to diversity, the vast majority viewed the mentoring relationship to be an essential component of their leadership development, and suggested a variety of ways to enhance it. There is no accounting for when a major life event will occur or its subsequent impact. However, the respondents persevered and were able to reengage in their continued development. In summary, the LCDP provided respondents with lifelong skills, a network of supporters, and confidence to succeed.

Appendix A: Project Timeline

October 1, 2014	VPO Appointment, Diversity and Leadership Programs
October 29, 2014	Orientation, ARL, Washington, DC
November–January, 2015	**Program Review Process**
	LCDP documentation review process, 1997–2014 (8 cohorts; 18 years; 150 fellows)
	GOAL 1: Identify core areas of focus and began preliminary draft of questions
	Survey design and re-design process
	GOAL 2: Develop draft survey and pretest instrument
Feb. 1, 2015	Developed draft survey (Draft #6)
March 1, 2015	Draft #6 of the survey was reviewed by Dr. Dorothy Persson, Retired Librarian, specialty in psychology and education
April 10, 2015	Project submitted to IRB (Institutional Research Board) for review (Draft #7)
April 12, 2015	Draft #7 of survey sent to Mark Puente for review and comment
April 14, 2015	Draft #8 of the survey was reviewed by Dr. Tim Ansley, Associate Professor and DEO of Psychological and Quantitative Foundations at the University of Iowa
April 16, 2015	UI Institutional Review Process complete
April 17, 2015	Sent Draft #9 of survey to Mark Puente for review and to ARL associate to convert Word document into survey form
Survey Description	Perception-based assessment of: program components—Leadership, Career Coaching, Engagement: 38 closed-ended Questions; 2 open-ended questions
	Survey Pretest Activities
	GOAL 3: Pretest survey and debrief participants via focus group discussion
April 23, 2015	Solicited volunteers to pretest survey (ideally, 8–10 participants; at least one fellow from each of the 8 cohorts)
June 11, 2015	Distributed pretest
	Reviewed pretest results and modified survey
June 27, 2015	Facilitated focus group discussion (debriefing) during ALA annual in San Francisco
August 2015	Further refined the survey based on knowledge gained from focus group discussion
September 3, 2015	Sent Draft # 10 of revised survey to Mark Puente for final review
***Revised Survey Description**	
	Perception-based assessment of: program structure and delivery; mentoring relationship, professional engagement and overall impact: 30 closed-ended questions and 6 open-ended questions.
	Survey Distribution and Data Collection Process
	GOAL 4: Finalize design, distribute survey, and collect responses
September 11, 2015	Completed final revisions to survey

September 15, 2015	Deployed survey (n=140)
September 30, 2015	Original date to close survey
October 1, 2015	VPO appointment officially concluded
October 4–7, 2015	ARL Membership Meeting
October 5, 2015	Survey Closed (72 respondents; 51.4% response rate)
	Analyze data
	Goal 5: Review data, analyze findings and draft report
October 8–Dec. 10, 2015	Reviewed data and drafted report
December 19, 2015	Submitted draft report to Mark Puente for review

Appendix B: Survey

ASSOCIATION OF RESEARCH LIBRARIES®

Association of Research Libraries
Leadership and Career Development Program Survey, 2015

This survey is part of a comprehensive review of the Association of Research Libraries' diversity initiatives and their impact on diversity recruitment and leadership development efforts.

You are receiving this survey because you are alumni of the Association of Research Libraries (ARL) Leadership and Career Development Program (LCDP). It is important to note that the structure of the LCDP and goals have evolved over the years to maintain its relevance. The LCDP was launched in 1997 to prepare more senior librarians from traditionally underrepresented racial and ethnic minority groups to take on increasingly demanding leadership roles (top leadership positions) in ARL libraries. The LCDP continues today as an 18-month fellowship with the goal of developing a cadre of future leaders equipped to serve increasingly diverse learning communities in libraries.

This survey was designed to determine your **overall** perception of the LCDP and its impact on your career development over time. For that reason, the survey will require you to reflect on your individual experience as a fellow—before, during and after graduation. We acknowledge that time has an impact on memory; the LCDP was established some 18 years ago. Given that understanding, for each question please select the response which best reflects your answer.

It will take you approximately 15 minutes to complete this survey. Your participation is confidential–no names are associated with individual responses. Your participation, although voluntary, is vital to the future of the LCDP.

Please complete the survey only once and, if possible, use only one device.

The survey will close on **September 30, 2015**.

General Information

1. How did you find out about the LCDP? Select all that apply.

- ☐ Co-worker
- ☐ Colleague from another library or profession
- ☐ Supervisor
- ☐ Dean/Director
- ☐ Past LCDP graduate
- ☐ LCDP facilitator/speaker
- ☐ Professional association
- ☐ E-mail/listserv
- ☐ ARL website
- ☐ Other (please specify)

Appendix C: Survey Invitation

Tuesday, September 15, 2015

Dear colleagues,

You are receiving this survey because you are alumni of the Association of Research Libraries' (ARL) Leadership and Career Development Program (LCDP). This survey was designed to assess your overall perception of the LCDP and its impact on your career development over time. Your participation is confidential—no names will be associated, in any way, with individual responses. Your participation, although voluntary, is vital to the future of the LCDP. Please complete the survey by **Wednesday, September 30, 2015**.

As an incentive for your participation in this study, you will be eligible to register for a drawing for an iPad Mini. At the end of the survey, you will be provided a link to a separate registration form for the drawing. The winner of the drawing will be announced on the LCDP listserv two weeks after the close of the survey.

If you have any questions about the survey, please contact me (contact information in the email signature line) or the principal investigator of the assessment, Carlette Washington-Hoagland.

With sincere thanks!

Mark

Mark A. Puente
Director of Diversity and Leadership Programs
Association of Research Libraries
21 Dupont Circle, NW

Suite 800
Washington, DC 20036
(202)296-2296

mpuente@arl.org
http://www.arl.org/diversity/
http://www.arl.org/leadership/

Appendix D: Tables with Survey Data

Table 1: How did respondents learn about the ARL LCDP (Q1)?*

Source	Total Respondents	%
Past LCDP Participant	22	30.5%
Dean/Director	19	26.3%
Other Colleague	18	25.0%
E-mail/Listserv	17	24.0%
*Select all that apply		

Table 2: Who initially encouraged your application (Q2)?

Source	Total Respondents	%
Self-nomination	22	30.6%
My Dean/Director	18	25.0%
My Supervisor	10	13.9%
Past LCDP Participant	9	12.5%

Table 3: LCDP Cohorts (Q3)

Cohort	Total Graduates	%	Total Respondents	%
1997/98 (Inaugural)	21	14.0%	8	11.0%
1999/00 (Millennial)	18	12.0%	6	8.0%
2001/02 (New Century)	20	13.0%	6	8.0%
2003/04 (Intentional Visionaries)	22	15.0%	10	14.0%
2007/08 (Renaissance)	20	13.0%	8	11.0%
2009/10 (Vanguard)	10	7.0%	8	11.0%
2011/12 (Luminary)	18	12.0%	9	13.0%
2013/14 (Phoenix)	21	14.0%	17	24.0%
Total	150	100.0%	72	100.0%

Note: Survey distributed to 140 active e-mail addresses

Table 4: Type of Employing Library (Q4 and Q6)				
Type of Library	Pre-LCDP	%	Current	%
Academic	68	94.4%	60	83.3%
Public	0	0.0%	2	2.8%
School (K–12)	0	0.0%	0	0.0%
Community College	0	0.0%	1	1.4%
Special	4	5.6%	5	6.9%
Not in a Library	0	0.0%	4	5.6%
Total	72	100.0%	72	100.0%

Table 5: Working at an ARL member institution? (Q5 and Q7)				
Y/N	**Pre-LCDP**	**%**	**Current**	**%**
Yes	56	77.8%	48	66.7%
No	16	22.2%	24	33.3%
Total	72	100.0%	72	100.0%

Table 6: Years of Library Experience (Q8 and Q9)				
Years	**Pre-LCDP**	**%**	**Current**	**%**
1–3	5	6.8%	0	0.0%
4–7	33	45.8%	2	2.8%
8–11	23	31.9%	17	23.6%
12–15	9	12.5%	18	25.0%
16+	2	2.8%	35	48.6%
Total	72	99.8%	72	100.0%

Table 7: Career Status (Q10 and Q11)				
Status	**Pre-LCDP**	**%**	**Current**	**%**
Mid-Career/N-S	49	68.1%	29	40.3%
Mid-Career/S	15	20.8%	9	12.5%
Upper Management	8	11.1%	17	23.6%
Administration	0	0.0%	13	18.0%
Non-Librarian	0	0.0%	4	5.6%
Total	72	100.0%	72	100.0%

Table 8: Postgraduate Education (Q12 and Q13)*				
Activity	**Pre-LCDP**	**%**	**Currently**	**%**
Second Master's	19	26.4%	5	6.9%
Doctorate/PhD	4	5.6%	8	11.1%
Certificate	2	2.8%	4	5.6%
Graduate/No Degree	11	15.3%	10	13.9%
Other	5	6.9%	10	13.9%
None	38	53.0%	41	57.0%
*Select all that apply				

Table 9: Professional Engagement (Q23 and Q25)				
Level of Activity	**Pre-LCDP**	**%**	**Currently**	**%**
Very Active	18	25%	22	30%
Active	31	43%	28	39%
Somewhat active	18	25%	11	15%
Not very active	5	7%	9	13%
Not active at all	0	0%	2	3%
Total	72	100%	72	100%

Table 10: Professional Engagement Activities (Q27 and Q28)*				
Type of Activity	**Pre-LCDP**	**%**	**Currently**	**%**
Service to Home Institution	67	93%	66	92%
Presentation	61	85%	57	79%
Service to Professional Organizations	60	83%	57	79%
Scholarly Publication	42	58%	39	54%
Scholarly Research	32	44%	32	44%
Other	5	7%	13	18%
*Select all that apply				

Table 11: Gender (Q33)				
Gender	**Total Graduates**	**%**	**Respondents**	**%**
Male	27	18.0%	12	17.0%
Female	106	70.7%	60	83.0%
Missing	17	11.3%	0	0.0%
Total	150	100.0%	72	100.0%

Table 12: Ethnicity (Q34)*				
Ethnicity	**Total Graduates**	**%**	**Respondents**	**%**
Black/African American	66	44%	31	43%
Asian/Asian American	32	21%	18	25%
Hispanic/Latino	18	12%	15	21%
Biracial/Multiracial/Other	4	3%	15	21%
American Indian/Native American	2	1%	6	8%
Missing	28	19%	0	0%
*Select all that apply				

Table 13: Age (Q35)		
Range	**Respondents**	**%**
≤ 30	0	0.0%
31–37	2	2.8%
38–43	16	22.2%
44–49	22	30.5%
50–55	21	29.2%
56–61	8	11.1%
62 ≥	3	4.2%
Total	72	100%

Table 14: Core Program Components and Activities (Q14)			
Program Component and Activities	**Very Important and Important**	**%**	**Total Respondents***
Multi-day Institutes	66	94.3%	70
Site Visit	51	82.3%	62
Career Coach/ Mentoring	48	71.6%	67
Self-assessment	54	77.1%	70
Research Project	39	55.7%	70
Online Activities	24	44.4%	54
Note: Does Not Apply responses were subtracted from the total.			

Table 15: Attributes of Learning Environment (Q22)		
Attribute	**Strongly Agree or Agree**	**%**
Adept delivery of program?	68	94.4%
Dedicated time with cohort away from workplace facilitated engagement?	66	91.7%
Variety of learning activities was essential to engagement?	66	91.7%
Well-developed curriculum?	64	88.9%

Table 16: Mentoring Relationship (Q19)							
My Career Coach:	**Strongly Agree or Agree**	**%**	**Somewhat Agree**	**%**	**Strongly Disagree or Disagree**	**%**	***Total**
Challenged me to view issues from diverse perspectives	31	45%	19	27%	19	27%	69
Provided constructive feedback	37	54%	18	26%	14	20%	69
Was invested in my success	37	53%	21	30%	12	17%	70
Made time when I needed support	43	62%	11	16%	15	22%	69
Helped to broaden my professional visibility	29	42%	9	13%	31	45%	69
Provided a firsthand perspective of the inner workings of a complex organization	49	68%	7	11%	13	20%	69
Continues to support my success	18	27%	8	12%	40	61%	66
Helped me to successfully navigate the research process	16	25%	11	17%	38	58%	65

Table 17: Recommendations for Improvement-Mentoring Relationship (Q20)		
The mentoring relationship could have benefited from:	**Strongly Agree or Agree**	**%**
A facilitated workshop on the mentoring relationship	49	68%

Table 17: Recommendations for Improvement-Mentoring Relationship (Q20)		
More consistent interaction with career coach	43	59%
More dedicated time with career coach	42	58%
Resource material on the mentoring relationship	41	57%
A dedicated person to contact when problems occurred in the mentoring relationship	36	50%
An opportunity to discuss the mentoring relationship with cohort	37	51%

Table 18: Area of Impact (Q30)		
Impact	**Strongly Agree or Agree**	**%**
Deepen my commitment to long- and short-term personal and professional development	56	78%
Step out of my comfort zone	56	78%
Form a strong network of colleagues	55	76%
See life as a journey and pursue new opportunities as they arise	55	76%
Become more confident in my leadership ability	54	75%
Become more reflective in the decisions that I make	54	75%
Become more self-aware	54	75%
More readily embrace new challenges	54	75%
Achieve one or more of my career goals	52	72%
Discover untapped leadership skills	51	71%
Re-evaluate my career objectives and develop an implementation strategy for success	51	71%
Become more confident in my ability to lead from any position in an organization	50	69%
Build useful knowledge base I can readily access at any point to facilitate my career development	50	69%
Become more deliberate at building new professional relationships	48	67%
Acquire new knowledge that was immediately relevant to my work	45	63%
Established connections that helped me achieve one or more of my career goal/s	41	57%

Table 19: Research project led to new opportunities (Q17)		
Y/N	**Respondents**	**%**
Yes	32	44%
No	40	56%

Table 20: Major Life Changing Event Impact on Career Development (Q31)		
Y/N	**Respondents**	**%**
Yes	40	55.6%
No	32	44.4%
Note: A major life changing event is defined here as an experience that changes a person's status or circumstances, such as the birth of a child, marriage, divorce, death of a loved one, loss of a job, relocation due to spouse/partner's job or family responsibilities, etc.		

Table 21: At what point did your experience as a fellow coalesce in a meaningful way that led to action? (Q15)		
Point of Impact	**Respondents**	**%**
During the program	36	50%
Soon after	19	26%
Years after	8	11%
Not yet	5	7%
Other	4	6%
Total	72	100%

Using Appreciative Inquiry Methods to Build a Culture of Assessment and Library Instruction Program from the Bottom Up: Uncovering Librarian Values, Assumptions, Beliefs, and Best Practices

Donna Ziegenfuss
University of Utah, USA

Abstract

The purpose of this research study was to explore the underlying culture of library instruction and the identity of teaching librarians by using a qualitative methodology called appreciative inquiry. Cooperrider, Whitney, and Stavros describe appreciative inquiry as being "based on the simple assumption that every organization has something that works well, and those strengths can be the starting point for creating positive change."[1] Fourteen interviews were audio taped, transcribed, and analyzed. LibQUAL® survey data, as well as end of course student evaluation data, were used to triangulate the findings. Sixty-one codes emerged from the data, and seven categories were developed. Categories were winnowed down to five main themes. A grounded theory core variable was also identified and related back to the literature and the five themes.

Introduction

Change topics in higher education such as emerging technologies, shifting student demographics, and an increasing focus on accreditation and assessment are common themes in the higher education literature. Academic research libraries are not immune to this wave of change. In fact, the establishment of the new ACRL framework, and an increased focus on library value and impact on student learning, makes it even more imperative to uncover and understand the changing library context and roles of librarians on college and university campuses.[2] Library change is a complex process and calls for strategic thinking, organizational buy-in, and evaluation of the change process. But where do you start? Traditionally, change initiatives originate at the top of the organization and are pushed downward to initiate change. However, change methodology is evolving and there is increasing consideration for the buy-in of all stakeholders.[3] This paradigm shift in change management places more value on participatory practices and a "leading from place," or from anywhere within the organization.[4] This paper will present a case study of one approach to thinking about grassroots level change in the library. To get at the underlying culture of library instruction and the role of librarians who teach in an academic library, a qualitative methodology called appreciative inquiry was utilized to gather interview data from librarians at one institution. Appreciative inquiry shifts the focus from identifying organizational problems and challenges to building on the possibilities, and applying research findings to initiate positive change.[5] This "positive-focused" methodology was selected for this study because recent library reorganization resulted in strong opinions and a less than optimal work environment. In addition, the researcher, although an associate librarian in this library for over five years, is not an MLS-educated librarian. She is what is often referred to as a "feral librarian"[6] and often disparaged for not understanding the librarian culture. Conducting this research has helped this researcher come to a better appreciation of the culture and history of teaching librarians, and academic libraries in general, and therefore has better informed her possible contribution to the teaching and learning mission of this academic library.

In addition to uncovering the values, perceptions, and attitudes of teaching librarians, study data will also be used to rethink library instruction programming based on the strengths of the organizational members. As libraries evolve due to emerging technologies, changing student demographics, and university financial constraints, findings from this case study might also be of interest to other institutions undergoing similar library reimaging initiatives and strategic planning processes.

The four research questions that guided this study were:

1. What are the best teaching/research/consultation stories and experiences reported by teaching librarians at the University of Utah?
2. How do these experiences relate to their teaching librarian identity?
3. What are the core principles and values related to teaching that librarians at this one institution report?
4. What are the themes and threads that cross over the librarian experiences that could be used for creating synergy, a community of practice, and evidence for program planning?

Literature Review

This research builds on the body of literature that investigates the identity and role of teaching librarians. Previous research conducted on the "emotional work" of instructional librarians,[7] Seymour's ethnography work on instructional librarians,[8] and the different ways of interpreting theory and practice provided the groundwork for this research.[9] Much is also written about whether or not librarians should even be teachers, and how teaching impacts the professional role of the librarian,[10] but the belief of this researcher is that the value of the teaching librarian will play a critical role in the academic library of the future. Therefore, this study focuses on uncovering the beliefs, values, and practices of teaching librarians, specifically at the University of Utah, with the intention of using data to inform library program design and assessment practices at this particular library.

A review of the librarian identity literature that goes back several decades indicates controversy around the teaching role and identity of librarians. In the past, not only was a librarian teaching role controversial, but some researchers have also questioned whether librarians should even be teachers and hold faculty status.[11] Wilson presents a negative picture and contends that librarian faculty status is not equal to the disciplinary faculty status.[12] Today, however, the status of librarians is changing and depends on the organizational structure of the institution. In addition, early literature contends that since librarians serve in support roles they may be less respected teaching partners.[13] Even though the word "service" is often associated with the work of librarians and the mission of libraries, these perceptions are changing. Nalani-Meulemans and Carr recommend that librarians advocate for a non-service librarian teaching role and be more proactive in dealings with faculty.[14] Other researchers report on strategies for improving faculty-librarian relationships especially in the areas of communication and collaboration.[15] Since librarians are not usually the "teacher of record" and are often seen more as guest lecturers in the college classroom, they can lack access and interaction with students, as well as ownership of assignments and assessments. Finally, information literacy concepts are sometimes not valued or understood by disciplinary faculty. This makes it difficult for librarians to collaborate with faculty or convince faculty to set aside valuable class time for library instruction.[16]

Similar to other disciplinary faculty teaching in higher education, librarians do not often receive teacher training as part of their library school programming, and are therefore often resistant to teaching once employed in academic libraries.[17] Other organizational structures in the university can cause additional barriers to the relationship between librarians and disciplinary faculty. As part of doctoral training, disciplinary faculty are encultured into the Boyer module of higher education with roles and responsibilities defined by a three-part model of teaching, research, and service; but libraries have different organizational models.[18] Disciplinary faculty often work with a small number of students focused within a single discipline. Librarians, on the other hand, have more varied roles and responsibilities in academic libraries with less adherence to the Boyer teaching, research, and service structure. Due to this gap in the higher education and librarian cultures, disciplinary faculty can often be unaware of the skills and expertise that librarians can bring to the classroom.

Scalability and sustainability are also becoming issues as librarian roles change. In addition to teaching and mentoring students in many different disciplines across campus in research and information literacy, librarians are also assuming new roles in academic libraries such as in data management, instructional design, scholarly publishing, and digital scholarship.[19] As librarian roles become more specialized, it becomes even more important to investigate, support, and promote the teaching librarian role within this complex library structure. Newer trends in the literature are exploring other changes such as embedded librarianship,[20] and what Whitchurch calls "third space" professional staff.[21] Although not specifically associated with librarianship, another theoretical framework emerging in the literature, called boundary crossing, may become more relevant to the

work of librarians who regularly cross disciplinary, organizational, and functional boundaries.[22]

Methodology

Rationale for the Study

For this research study, an appreciative inquiry approach was selected to help uncover what librarians describe as their best and most rewarding teaching librarian experiences. Due to a recent reorganization, a department originally called education services, with a primary focus on teaching and learning, was renamed and changed. Although some teaching responsibilities are distributed across other departments in this academic library, the bulk of the teaching responsibilities are housed in this unit. For these teaching librarians, their teaching identities were fractured due the top down reorganization process. With a weak culture of library assessment and with a sense that their "invisible labor" of planning, designing, and implementing teaching was not fully appreciated at the administrative level, the researcher hoped to use a positive and more proactive approach to define and articulate the value of the teaching librarians. Since this researcher is a library outsider, this study also provided an opportunity to study the perceptions and attitudes of teaching librarians and better understand the library teaching culture. Coming to the library with a very different professional enculturation experience (EdD program in education and instructional design), this research provided a unique lens through which to uncover commonalities in librarian identities.

Sampling and Methods

Purposive sampling was used to identify volunteers for the research study. Twelve teaching librarians and two professional teaching staff, with a wide range of liaison subject specialties and work experience, participated in the interview process. Eight females and six males were interviewed. As a group, the study participants have a wide range of teaching experience such as being embedded librarians where librarians meet 10 times with a cohort of students across two semesters; in freshman writing one-shot sessions; in one-shots and orientations for international students; in undergraduate upper level courses and graduate level courses; in faculty and graduate student workshops and seminars; and one librarian who mainly conducts advanced research consultations for graduate students, faculty, and visiting scholars in a very specific disciplinary area. The appreciative inquiry methodology approach focused on asking the fourteen librarians questions about their most positive and best teaching experiences. Instead of focusing on the negative aspects of barriers and challenges of teaching library instruction, four core questions were designed to trigger their best memories or dreams. The appreciative inquiry questioning structure consists of four components: discovery, dreaming, designing, and destiny.[23]

The four interview questions were:

1. Can you share a story about a teaching or librarian experience that you have had where you felt energized or felt you really impacted a student or group students? (discovery—what gives life)
2. What do you value about your role as a librarian and/or teacher? (discovery—what gives life)
3. If you had three wishes for how to impact student learning through your library instruction in the future, what would they be? (dream and design—what might be)
4. What would the future look like if you adapt these experiences and values you talked about today to create greater or better new teaching experiences in the future? (destiny—what should/will be)

To begin the project, the researcher hired an undergraduate MUSE (My University Signature Experience) research intern through a grant.[24] The MUSE intern, already with training in interviewing and qualitative methods, conducted all of the interviews and assisted with the preliminary coding of the data. She also brought a student-focused perspective to the data analysis. The main reason that the MUSE intern conducted the interviews was to help limit any bias that the non-MLS researcher might have had in asking questions and conducting the interviews with her peers. Fourteen interviews were conducted, audiotaped, transcribed, and analyzed using grounded theory qualitative methodologies.[25] Preliminary analysis of the interview data by the intern researcher was triangulated by the primary researcher.

Interview data were first open coded by the MUSE intern in Excel. The librarian researcher then repeated the open coding process on the data using Microsoft Excel as the preliminary analysis tool because the MUSE intern did not know how to use NVivo. Coding from across the two coders were discussed, consolidated, and winnowed down into

one set of open codes. Over 600 coded instances emerged from the interviews and 61 codes were identified. Excel spreadsheets were then imported into NVivo and recoded again by the primary researcher using three additional rounds of axial coding and a constant comparison method to reevaluate the coding categories. Through the NVivo coding process, the 61 codes were reduced to seven main categories. The seven categories were then consolidated and winnowed down to five unique and main themes. Selective coding processes were then used to analyze relationships between the five themes to identify a core variable. Corbin and Strauss define selective coding as "selecting the core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development."[26] A core variable is the main theme of the study and all major themes must relate to it.In addition, qualitative comments collected during a previous LibQUAL survey, as well as end-of-semester student course feedback from the librarian embedded courses, were analyzed and used to triangulate the findings.

This conceptual collection of categories, themes, and the core variable was then used to supplement the brainstorming and discussions from departmental strategic planning workgroups and to create a departmental framework to help define the identity of the unit and to articulate guidelines for teaching best practices for library instruction (see Appendixes A and B for draft planning documents).

Results

The findings provide a detailed description of the experiences and aspirations of instruction librarians, as well as an understanding of the library context in which they work and teach information literacy. From the 600 coded instances, 61 codes emerged. Of the 61 codes, the most prominent codes were: *reward of helping, faculty-librarian collaboration, teaching approach, engaged learning, making connections* and *personalization of the learning process*. Through continued analysis, seven main categories were identified: (1) ***teaching approaches/values***; (2) ***a helping profession***; (3) ***personalization priorities***; (4) ***faculty-librarian relationships***; (5) ***mentoring culture***; (6) ***lacking control***; and (7) ***beyond information literacy expectations***. From these seven categories and reevaluation of the relationships of these categories to the 61 original codes, five main themes emerged from the data. The five main themes are: (1) **Emerging and Converging Identities**; (2) **Moving Beyond Helper to Mentor**; (3) **Overlapping Cultures and Identities**; (4) **Value-Added Roles and Responsibilities**; and (5) **Blurring Professional and Personal Boundaries**. Some codes occur as threads across several themes and some are more localized in specific themes. The relationship of the 61 codes, the seven categories, and the five themes is represented in Table 1. The "X" on the table indicates in which themes the 61 codes occur. For example, the first code in the table under ***Category #1, Teaching Approaches/Values*** is *engaged teaching approaches/values.* This code had the largest number of coding instances. This code occurs under all five main themes. This is not surprising, since the participants were prompted to talk about their "best" teaching experiences.

In addition to content coding, each code was also classified as either being a positive "benefit/opportunity" or a negative "challenge" code. The positive versus negative codes are presented together in Table 1. However, the codes in Table 1 with an asterisk indicate that these are negative codes. Only 12 of the original 61 codes were labeled as all negative codes. The rest of the 61 codes were mixtures of positive and negative code instances. Using the appreciative inquiry process did result in a proportionately higher percentage of more positive codes (70.2%) versus negative codes (29.8%). Table 2 shows the percentages of positive and negative codes broken down across the five main themes. The highest percentage of negative code instances occur in the **Overlapping Cultures and Identities** theme and the smallest percentage of negative coding is associated with the **Blurring Professional and Personal Boundaries** theme. Positive coding is generally more evenly distributed across the five themes.

Table 1. Relationship of 61 codes, 7 categories, and 5 main themes identified from 14 interviews

Themes: 7 Categories/61 Preliminary Code Categories	Emerging and Converging Identities	Moving Beyond Helper to Mentor	Overlapping Cultures and Identities	Value-Added Roles and Responsibilities	Blurring Professional and Personal Boundaries
Category 1: Teaching Approaches/Values (29.1% of codes)					
engaged teaching approaches/values	X	X	X	X	X
engaged learning values	X	X	X	X	X
assessment strategies	X	X	X	X	
real world assignments			X	X	X
continuous improvement	X	X		X	
technology as a barrier *	X			X	X
motivation to keep learning	X				X
group experiences	X				
needs-based approach	X				
facilitating discovery/ curiosity	X				X
anxiety in grading and people skills *	X				
timing an issue *				X	
student ownership				X	
learning by doing					X
Category 2: A Helping Profession (15.5% of codes)					
reward of helping	X	X	X	X	X
making a difference		X		X	
job satisfaction	X	X			
library culture			X		
being more proactive	X				
learning from students	X				
rewarding		X	X		
helping profession					X
growing through learning					X
developing style and identity	X				
Category 3: Personalization Priorities (14.3% of codes)					

Themes: **7 Categories/61 Preliminary Code Categories**	**Emerging and Converging Identities**	**Moving Beyond Helper to Mentor**	**Overlapping Cultures and Identities**	**Value-Added Roles and Responsibilities**	**Blurring Professional and Personal Boundaries**
making connections	X	X	X	X	X
personalization of the learning		X	X	X	
personal approach					X
personal interests		X			X
personal preferences			X		X
learning preferences			X		X
continuous improvement/students	X	X			
Category 4: Faculty-Librarian Relationships (12% of codes)					
faculty-librarian collaboration	X	X	X	X	
collaboration	X				X
communication breakdown *	X		X	X	X
lacking awareness of librarian work *	X				
developing awareness	X		X	X	
integration of library and course			X	X	
cultural differences *			X		
common interests					X
impact—lack of *					X
Library value not visible *				X	
Category 5: Mentoring Culture (12% of codes)					
librarian values	X	X		X	X
mentoring	X	X	X		
lifelong learners	X		X	X	
scaffolding learners	X		X	X	
can't reach all students *			X	X	
contextual issues				X	
not disciplinary related				X	
Category 6: Lacking Control (9.4% of codes)					
lacking control *	X	X	X	X	

Themes: 7 Categories/61 Preliminary Code Categories	Emerging and Converging Identities	Moving Beyond Helper to Mentor	Overlapping Cultures and Identities	Value-Added Roles and Responsibilities	Blurring Professional and Personal Boundaries
develop awareness of library work *	X		X	X	
prior experiences					X
information overload *	X		X	X	
communicating—the 'why'					X
on the fringe—cultural & pedagogical differences	X		X		
isolated in library *	X				
Category 7: Beyond Information Literacy Expectations (7.7% of codes)					
beyond information literacy		X	X	X	
skill set—beyond information literacy	X			X	
beyond books/resources				X	
beyond the classroom				X	
value of resources			X	X	

* indicates the codes with only challenging coding; all other codes were a mix of positive-opportunity type codes and negative-challenging codes

Table 2. Percentages of the Positive (Opportunity) Codes vs. the Negative (Challenging) Codes Distributed by Theme

Themes	Percentage of All Coding	Percentage of All Coding
Emerging and Converging Identities	21.1%	15.1%
Moving Beyond Helper to Mentor	17.1%	10.7%
Overlapping Cultures and Identities	22.2%	43.4%
Value-Added Roles & Responsibilities	26.5%	24.5%
Blurring Professional and Personal Boundaries	13.1%	6.3%

The five main themes identified in this study are defined here.

1. **Emerging and Converging Identities**
   This theme encompasses all of the coding related to how the participants discussed their continual growth and change as a teacher. A majority of the coding associated with this theme related to how rewarding teaching is for them, what they value about teaching, and the approaches they use in their teaching. Important codes in this theme are *continuous improvement, trial and error, not being afraid to fail, making a difference,* and *how much they learn from their students*. The negative codes that describe this theme are l*ack of control in a classroom* and *lack of communication with faculty partners*. An

example from this theme is how one participant talks about his trial and error method and improvement of teaching, which was coded as *teaching approaches/values*: "I only get 5 visits for LEAP [an embedded librarian experience] in the 1st semester... but I feel that I need to experiment with them. And you know every year you'll experiment. You can try a process and it has failed then you have learned something from that."

2. **Moving Beyond Helper to Mentor**
   This theme depicts how the participants discussed the continuum of their librarian role as they have moved from helper to mentor. Many of the participants discussed how *rewarding "helping" students* can be, and how they establish relationships with students as they assume more of a mentor role. Data coded to this theme discussed how a helping or support role can have a negative impact on their collaboration with faculty partners. They voiced a common goal of wanting to move beyond providing just support or a service, and move more into a teaching mentor role. An example quote to demonstrate this theme is, "There was a student who came in and he wanted to be an engineer. He didn't want to know how to write and he even said that: 'I am going to be an engineer; I don't need to know how to write.' And he came in with this attitude that everything else was no good. And so to be able to change that attitude... was a best experience."
3. **Overlapping Cultures and Identities**
   This theme had the most negative codes associated with it. Librarians described how difficult it is to go into a classroom one time without knowing the students and try to create an engaging and relevant learning environment. They discussed the disadvantages of not being the instructor of record and not always on the same page as the faculty member. The participants discussed challenges of *integration* of library activities and content with course content and they felt the library and course components were often separate. They also discussed how the *culture of the library* and the cultures of disciplines were different. They also complained about lack of overlap and would like to see more overlap. One participant said, "I always ask for the assignment. But if they don't give it to me, I kind of have to go in cold and just hope that I am getting across what they need. But yes I prefer it when they give me the assignment ahead of time and I wish more of them wanted the help of a librarian in creating the assignment."
4. **Value-Added Roles and Responsibilities**
   In the value-added theme, participants discussed the possibilities and their wishes for having library instruction more valued by faculty and the administration. They discussed a lot of different ways they could add value to the classroom and also described ideas for creating "value" for students. One participant stated, "It is also hard to integrate. Another challenge is to integrate the library instruction in a way that the students see it as being a valuable contribution to the course. So a lot of times we go into a course or we get feedback from a student and they say, 'this was just busy work' or 'this was a waste of my time' or 'I already knew this stuff.'" Librarians discussed the value of "teaching moments" or having "one-on-one time" with students. Another participant discussed shifting values from finding information to using information, "Well we live in an age where information is easy to get and it is hard to use. They might not necessarily need as much help getting the information, finding the information... right, on both sides both the student and the teacher side getting to the point where they can more effectively teach and learn how to use the information as opposed to find it."
5. **Blurring Professional and Personal Boundaries**
   The last theme contains the codes and categories that discuss how teaching librarians blend or blur their personal and professional boundaries. The coding about the participants' passion and *helping students* or *caring about students* encompasses this theme. Participants talked about how rewarding it is to help students integrate their interests into their research assignments and often helped student "blur their own boundaries." This category also had the smallest percentage of negative codes. Codes under this theme relate to participants' *teaching passions, how much they learned from working with students, and how they were being "selfish" by bringing their own interests into the library classroom* to try to engage students. One participant claimed, "It is that kind of stuff that is fascinating to me. People come in and ask such interesting questions. I love that part about being a librarian. I love and really enjoy facilitating the discovery. To me it is just an emotional high, that discovery."

Once the five main themes of the study were identified, defined, and analyzed, the final phase of this grounded theory process involved selective coding to identify a core variable for the body of data. This process also included a revisiting of the literature looking for theoretical constructs that would align with the five themes and categories. A core variable of Boundary Crossing was identified by the researcher. Boundary crossing or boundary spanning is a term often found in the management, education, organizational development, and workplace learning literatures.[27] Engeström, Engeström, and Kärkkäinen describe boundary crossing as "horizontal expertise where practitioners must move across boundaries to seek and give help, to find information and tools wherever they happen to be available."[28] The authors also contend that boundary crossers "step into unfamiliar domains. It is essentially a creative endeavor which requires new conceptual resources. In this sense, boundary crossing involves collective concept formation."[29] This concept of working on the fringe of multiple systems and working across boundaries and barriers in interdisciplinary spaces aligns well with the themes of overlapping cultures, converging identities, blurring boundaries and moving beyond service.

In addition to the interview data collected and analyzed during this study in 2014–2015, the findings were also triangulated using an analysis of the Affect of Service section of the 2012 LibQUAL survey, and 2014 student course comment feedback provided by students in the LEAP (embedded librarian) courses. Both sets of qualitative survey comments support and triangulate the more affective aspects of the teaching librarian identity. However, due to restrictions on the length of this paper, only word cloud graphics of the actual comments are presented here. The word "helpful" is one of the most used words in both of these surveys. Graphic 1 is the word cloud of the Affect of Service section of LibQUAL comments that contain questions related to librarian, staff, and customer service. Graphic 2 is the word cloud diagram for the student comments from the official end of semester course feedback evaluation survey completed for LEAP courses where librarians are embedded.

Graphic 1. Word Cloud for LibQUAL Affect of Service Comments

Graphic 2. Word Cloud for Official End-of-Course Feedback Comments for Librarians

Discussion

As a researcher, I set out to investigate the role, attitude, and perceptions of teaching librarians in an academic library. However, since the library department under study is not a credit-bearing unit and librarians do not teach information literacy as the teacher of record, it was difficult to tease out the work of teaching librarians from interactions with faculty partners. Coding indicates that even though faculty-librarian collaborative work may overlap, the efforts of the two different cultures are not necessarily integrated. The largest number of negative coding is related to this **Overlapping Cultures and Identities** theme. For ***Category #4, Faculty-Librarian Relationships***, five of the 10 codes—*communication breakdown, lacking awareness of librarian work, cultural differences, lack of impact* and *library value not visible*—are negative codes. The study participants confirmed that faculty and librarians have common interests and goals, but there are often communication or lack of awareness issues. Librarians reported that library sessions can seem like an add-on to a course, often with little planning before the course between the librarian and faculty member. The positive codes for this theme are related to *common teaching approaches and values, rewarding aspect of teaching, support for mentoring of students* and the *scaffolding of student learning* across courses, semesters and programs. These findings about the struggles related to faculty-librarian partnerships and interactions are similar to those reported in the rich literature about faculty-librarian relationships.[30] Leadership training, recommendations for being proactive and getting a place at the table to collaboratively design assignments and assessments could help to reduce the negativity associated with this theme.[31]

Although I am just beginning the dive into the boundary crossing/boundary spanning literature, I have already uncovered some interesting strategies for decoding the interdisciplinary spanning process and can see how these new models, not commonly found in the library literature, may help in overcoming some of the barriers to faculty-librarian collaboration. For example, the concept of boundary crossing is built on the theoretical framework of activity theory, which provides a framework of instruments/tools, rules, division of labor, community, and interaction of a subject and object for helping decode the interaction between activity systems.[32] Ancona and Caldwell have investigated boundary spanning behaviors and have identified three concepts—ambassadors activities, task coordinator activities, and scout activities—as a way to unpack the type of work done by boundary spanners.[33]

The smallest percentage of negative codes connected to the theme **Blurring Professional and Personal Boundaries** theme are indicative of how very passionate and enthusiastic the study participants were about discussing how their job as a librarian blends their personal interests and personalities with their professional work. However, there are no **Blurring Professional and Personal Boundaries** codes that overlap with the **Beyond the Information Literacy Expectations** category. This was a very surprising finding. The participants were not as enthusiastic about discussing *information literacy skills* or the *value of resources* and *beyond information literacy*. These are more logistical teaching codes and less associated with the affective aspects of being a teaching librarian, which were more positive and rewarding for the participants.

On completing the bulk of the data analysis, I believe we need to look more holistically at the teaching librarians' role and not just be concerned with the logistics of teaching tools and techniques. Analysis of the data reveals that librarians value a more *personalized approach* to both their pedagogy and librarian professional role. The codes related to *caring* and *scaffolding more holistic learners* were prominent in the **Moving Beyond a Helper to a Mentor** category and also in the **Blurring of Personal and Professional Boundaries** category. Participants described more interest in helping students "act like a researcher" or develop dispositions of a researcher than they did in demonstrating information literacy tools and knowledge. As related to the changing character of their identities, librarians expressed an interest in focusing more on an integrated identity with a more visible leadership role. They also discussed "dreams" that could be couched as value-added work that could extend beyond the scope of their library role, especially in the area of collaboration with faculty and departments. One particularly important theme that emerged was discussion around the mention of continual "crossing of boundaries" between their personal and professional goals, and across different disciplines, and when working with students at different levels, and how this boundary crossing requires a continuous improvement mindset for learning. The importance of the personal touch in the learning process and one-on-one personalized learning appears more important for librarians in developing research dispositions, confidence, and attitude in students. Participants also acknowledged the importance of stepping up and out into new librarian roles and a desire for professional development for developing dispositions, confidence, and attitudes to help them adapt to newly emerging roles. The identity as a mentor and not just a helper will require a refocusing from being a service provider to a learning leader. All 14 of the study participants discussed the importance of self-reflection and evaluation of their teaching expertise and rethinking their approach to their teaching librarian role. Although the core variable of boundary crossing (or boundary spanning) has been confirmed as embedded in the codes, categories, and themes, there is still work to be done on designing a conceptual framework on how the teaching librarian literature can be best integrated with the boundary crossing body of literature.

Practical Implications

Exploring the librarian "dreams" and "wishes" provided insights and evidence-based data to incorporate into teaching guidelines documents, logic model planning for departmental goals, and an action plan for librarian professional development. The values, dispositions, and beliefs uncovered through the appreciative inquiry process were valuable elements when working to develop a logic model and framework for library instruction. Moving forward, findings and lessons learned from this study will be incorporated into face-to-face, hybrid, and online library instruction and modules. Identifying librarian expectations and discussing faculty expectations provided a richer description of the affective aspects of learning and teaching. The next step for this research is to interview faculty partners at this institution to uncover a more nuanced understanding of the librarian/faculty relationships existing in this institution. Appendix A and B contain some preliminary draft documents that were drafted to integrate some of the findings from this study into designing a teaching guidelines document (Appendix A) and a logic model for departmental planning (Appendix B). Librarian values uncovered in this study became a prominent component of the planning document. Due to the challenges identified in the study around communicating and collaborating with faculty, strategies for working with faculty are more explicitly represented and outlined in the teaching guideline document.

The identification of the boundary crossing core variable has also opened new avenues for future research and concepts for consideration. There is a paucity of research about how librarians might be considered boundary crossers. Further investigation of this new body of literature could open up a wider perspective on aspects of outreach librarianship and how librarians might better integrate with campus-wide partners. Using the theoretical and practical aspects of the boundary crossing literature could also help inform how librarians might better work with students transitioning from high school into college, and from college into the work environment, as well as with interdisciplinary teams of faculty.

Limitations of Study

Data was only collected from one institutional context and from those librarians mostly teaching in first-year or lower level information literacy class instruction. Data from additional interviews outside this institution may shed more light on

better defining the teaching identity of academic librarians. We cannot extrapolate these findings to other institutions with different teaching and academic librarianship cultures, however, the unique process used in this study, appreciative inquiry, can be translated and used to study teaching librarian identity at other institutions. Based on the fact that more positive responses were gathered during this appreciative inquiry process, this method might be a useful strategy for studying other library challenges and logistical problems. Additional analysis the data collected as part of this study could include looking at the coding responses by participant, not by theme, to try and identify specific persona types and strengths of teaching librarians which could then be used in librarian mentoring and professional development.

Conclusion

This study provided insight into the teaching and learning culture and teaching librarian identity at the academic library at this particular institution. On a personal level, this study has provided a different lens for me to view the teaching identity of librarians. It also provided an opportunity for me to blend my previous "outside of library world" teaching and learning experiences with the library literature and provide an evidence-based foundation for library instruction planning. Most importantly this experience provided evidence needed to align our departmental teaching expectations and "dreams" with learning outcomes, instructional planning, and teaching practice.

Donna Ziegenfuss, Associate Librarian, J. Willard Marriott Library, University of Utah

Email: donna.ziegenfuss@utah.edu
Phone: 801-585-0542

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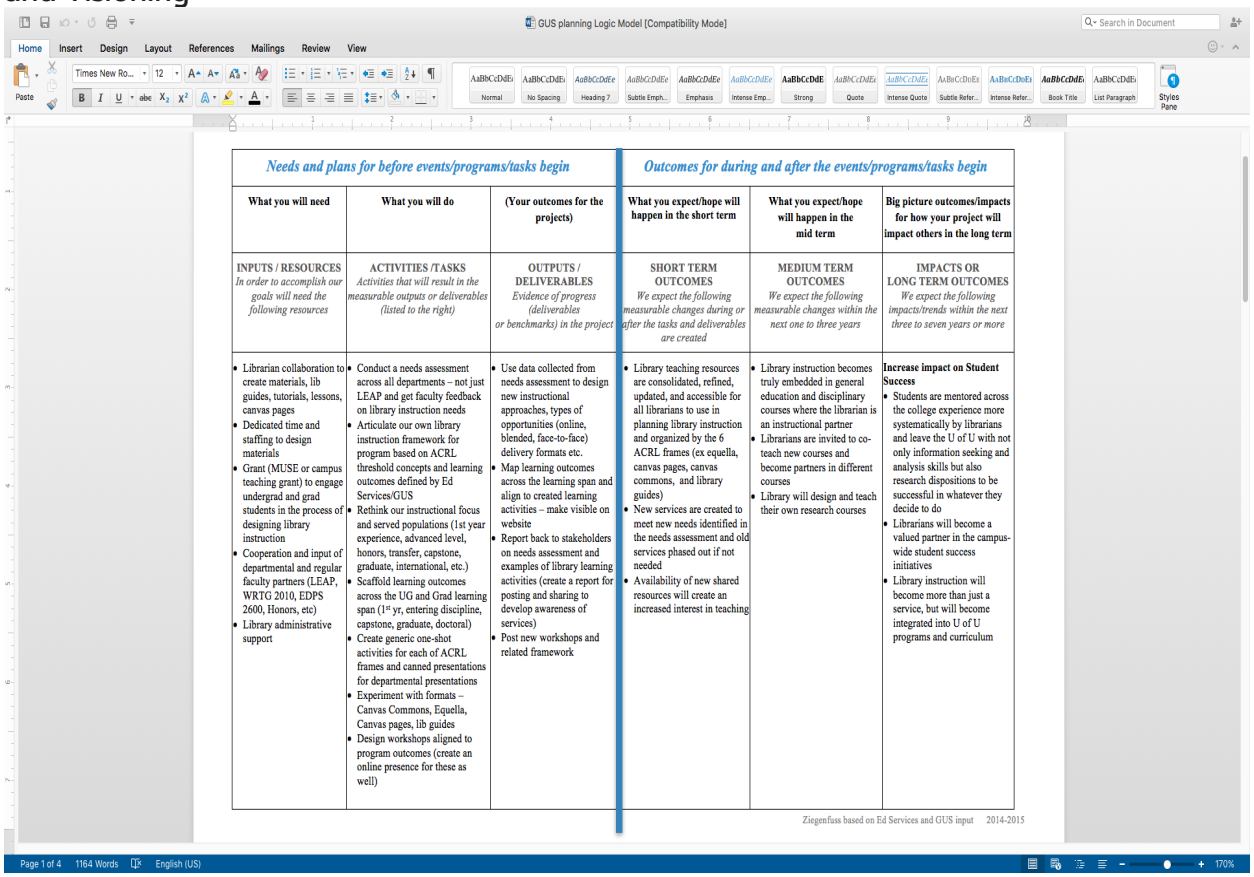
Appendix A. Teaching Best Practices Guidelines Draft Incorporating Librarian Values and Articulated Faculty-Librarian Collaboration Tasks

As Instruction Librarians We Value:	*Faculty Partnerships and Collaboration*	*Effective Instructional Practices*	*Supportive and Shared Learning Environments*	*Professional Responsibility*
Phase 1: DESIGN Instruction	• Contact the professor before the scheduled class (in person, email or on the phone) to identify class needs, goals, and outcomes for the session(s) • Plan the session length and content based on professor and student needs	• Design a coherent lesson plan that includes: outcomes, assessments, and teaching and learning activities in written or online format • Align lesson plan to the course syllabus. Ask for a syllabus in order to see what is included in the readings and what the projects will be. This will help shape and integrate your library instruction presentation. • Align lesson plan to the ACRL framework and/or AACU LEAP outcomes (review the Framework for Information Literacy prior to developing an instructional plan) • Align lesson plan outcomes to the GUS Information Literacy Outcomes	• Compile a variety resources (tutorials, handouts, examples) to incorporate into lesson planning to support student learning • Use relevant or real world examples if possible to help engage students in the session	• Use professional experience and teaching expertise to select appropriate content for library sessions
Phase 2: BUILD Learning Activities	• Collaborate with faculty on the development of the session to include teaching and learning activities and assessments, as well as relevant materials, databases, handouts, and activities	• Develop strategies to integrate students' prior experience/knowledge or questions into lesson • Gather relevant library resources and examples needed for the lesson plan • Create handouts or take-aways to help students navigate the lesson and use after the session • Develop tutorials or other materials if needed for inclusion in the instruction or materials • Design formative feedback opportunities to gather student feedback about the value of the library instruction session	• Create library guides or Canvas pages to supplement lesson that are easily to navigate • Build into the lesson opportunities for support into the Canvas course, library guide, and session (like tutorials or step-by-steps) to encourage learning beyond the session • Incorporate the best type of media for presenting materials related to the lesson plan •	• Provide a plan for implementing the lesson • Create professional looking materials • Provide contact information for post-instruction follow-up and consultations
Phase 3: TEACH F2F or Online	• Engage the course instructor in the information literacy session(s) if possible by asking questions, etc. • Request to be embedded into the Canvas course to provide better connection and access to students	• Outline what the session will cover (on board or in canvas)—learning targets/outcomes and content • Prepare and show command of the material • Use engaged teaching strategies to engage students in the session • Use questioning and discussion techniques (one example is think/share/pair) to break up lecture components • Use appropriate pacing (including waiting more than 3 seconds for students to respond to questions) • Finish the session by reviewing what was covered	• Establish a rapport with students • Create a respectful, supportive and shared learning environment • Check to see if students are lost or off task • Is aware of student questions or raised hands • Encourage student-student discussion and sharing	• Be on time for the instructional session to get set up and greet students • "Optional' recommendation to keep a teaching journal and track what we do with assessment and making changes to our teaching • Appear interested in and excited about the material • Adhere to standards of ethical conduct in the classroom • Grade the assessment if asked to do that by the instructor Create a safe and comfortable learning environment in each session that is respectful and inclusive for all students
Phase 4: REVISE Instruction: Close the Assessment and Evaluation Loop	• After the session, share reflections, observations, and ideas about the session(s) with the instructor as well as your plans for improvement	• Reflect on how the teaching session went. What to improve? What to omit? • Review formative feedback if collected from students for improving instruction • Ask for feedback from the instructor once an assignment is completed by the students	• Gather data about the student research experience and attitudes about doing research • Track follow-up incidences, subject guide stats or canvas analytics to measure how students utilize resources	• Plan for professional growth and development in the area of teaching • Design and implement assessment strategies to monitor the teaching and learning experience • Maintain accurate records of teaching, improvement strategies and assessment data • Record instructional sessions in Desk Stats • Request feedback from peers about teaching

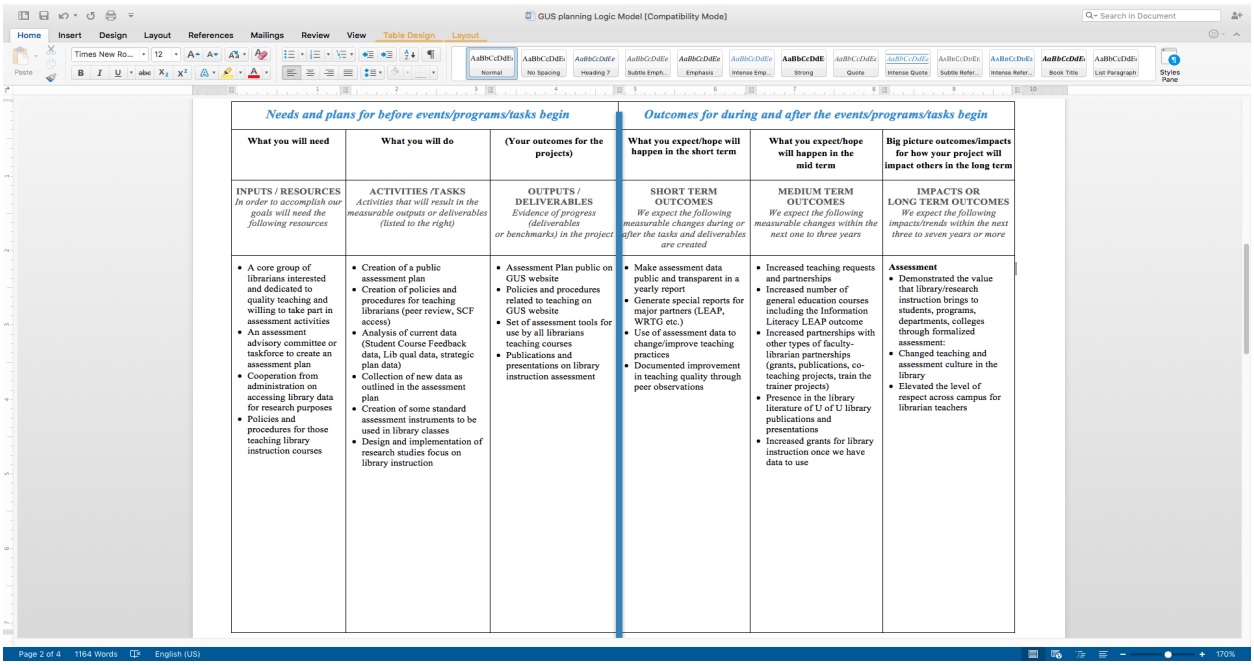
Appendix B: Logic Model for: Graduate and Undergraduate Services Priorities and Visioning



GUS planning Logic Model [Compatibility Mode]

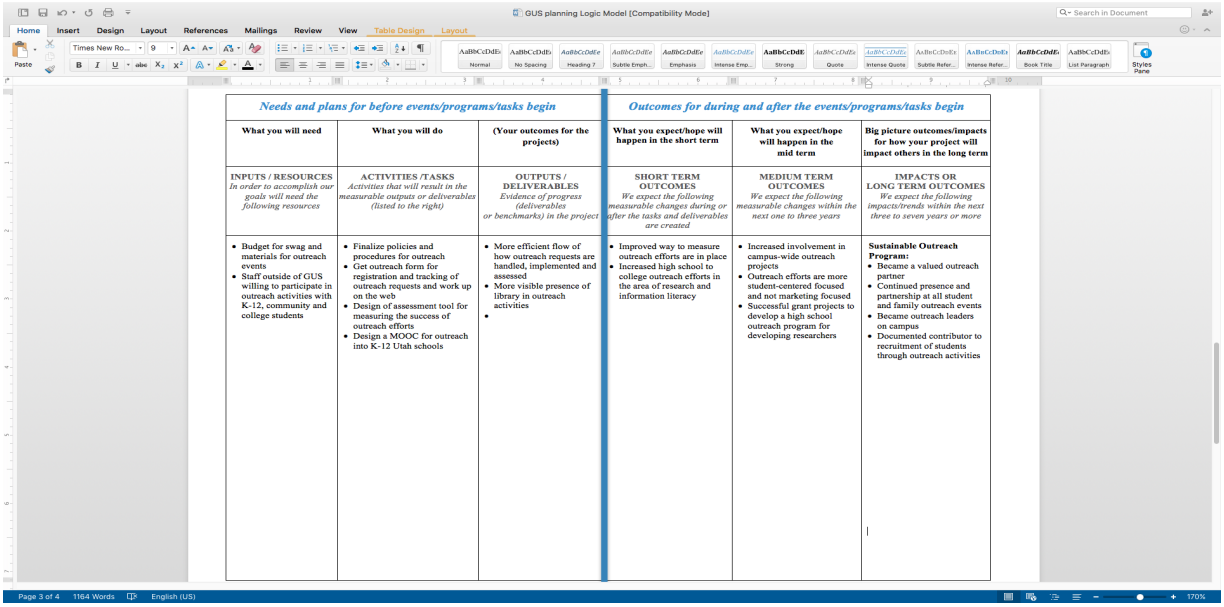
Needs and plans for before events/programs/tasks begin			*Outcomes for during and after the events/programs/tasks begin*		
What you will need	**What you will do**	**(Your outcomes for the projects)**	**What you expect/hope will happen in the short term**	**What you expect/hope will happen in the mid term**	**Big picture outcomes/impacts for how your project will impact others in the long term**
INPUTS / RESOURCES *In order to accomplish our goals will need the following resources*	**ACTIVITIES /TASKS** *Activities that will result in the measurable outputs or deliverables (listed to the right)*	**OUTPUTS / DELIVERABLES** *Evidence of progress (deliverables or benchmarks) in the project*	**SHORT TERM OUTCOMES** *We expect the following measurable changes during or after the tasks and deliverables are created*	**MEDIUM TERM OUTCOMES** *We expect the following measurable changes within the next one to three years*	**IMPACTS OR LONG TERM OUTCOMES** *We expect the following impacts/trends within the next three to seven years or more*
• Librarian collaboration to create materials, lib guides, tutorials, lessons, canvas pages • Dedicated time and staffing to design materials • Grant (MUSE or campus teaching grant) to engage undergrad and grad students in the process of designing library instruction • Cooperation and input of departmental and regular faculty partners (LEAP, WRTG 2010, EDPS 2600, Honors, etc) • Library administrative support	• Conduct a needs assessment across all departments – not just LEAP and get faculty feedback on library instruction needs • Articulate our own library instruction framework for program based on ACRL threshold concepts and learning outcomes defined by Ed Services/GUS • Rethink our instructional focus and served populations (1st year experience, advanced level, honors, transfer, capstone, graduate, international, etc.) • Scaffold learning outcomes across the UG and Grad learning span (1st yr, entering discipline, capstone, graduate, doctoral) • Create generic one-shot activities for each of ACRL frames and canned presentations for departmental presentations • Experiment with formats – Canvas Commons, Equella, Canvas pages, lib guides • Design workshops aligned to program outcomes (create an online presence for these as well)	• Use data collected from needs assessment to design new instructional approaches, types of opportunities (online, blended, face-to-face) delivery formats etc. • Map learning outcomes across the learning span and align to created learning activities – make visible on website • Report back to stakeholders on needs assessment and examples of library learning activities (create a report for posting and sharing to develop awareness of services) • Post new workshops and related framework	• Library teaching resources are consolidated, refined, updated, and accessible for all librarians to use in planning library instruction and organized by the 6 ACRL frames (ex equella, canvas pages, canvas commons, and library guides) • New services are created to meet new needs identified in the needs assessment and old services phased out if not needed • Availability of new shared resources will create an increased interest in teaching	• Library instruction becomes truly embedded in general education and disciplinary courses where the librarian is an instructional partner • Librarians are invited to co-teach new courses and become partners in different courses • Library will design and teach their own research courses	**Increase impact on Student Success** • Students are mentored across the college experience more systematically by librarians and leave the U of U with not only information seeking and analysis skills but also research dispositions to be successful in whatever they decide to do • Librarians will become a valued partner in the campus-wide student success initiatives • Library instruction will become more than just a service, but will become integrated into U of U programs and curriculum

Ziegenfuss based on Ed Services and GUS input 2014-2015



GUS planning Logic Model [Compatibility Mode]

Needs and plans for before events/programs/tasks begin			*Outcomes for during and after the events/programs/tasks begin*		
What you will need	**What you will do**	**(Your outcomes for the projects)**	**What you expect/hope will happen in the short term**	**What you expect/hope will happen in the mid term**	**Big picture outcomes/impacts for how your project will impact others in the long term**
INPUTS / RESOURCES *In order to accomplish our goals will need the following resources*	**ACTIVITIES /TASKS** *Activities that will result in the measurable outputs or deliverables (listed to the right)*	**OUTPUTS / DELIVERABLES** *Evidence of progress (deliverables or benchmarks) in the project*	**SHORT TERM OUTCOMES** *We expect the following measurable changes during or after the tasks and deliverables are created*	**MEDIUM TERM OUTCOMES** *We expect the following measurable changes within the next one to three years*	**IMPACTS OR LONG TERM OUTCOMES** *We expect the following impacts/trends within the next three to seven years or more*
• A core group of librarians interested and dedicated to quality teaching and willing to take part in assessment activities • An assessment advisory committee or taskforce to create an assessment plan • Cooperation from administration on accessing library data for research purposes • Policies and procedures for those teaching library instruction courses	• Creation of a public assessment plan • Creation of policies and procedures for teaching librarians (peer review, SCF access) • Analysis of current data (Student Course Feedback data, Lib qual data, strategic plan data) • Collection of new data as outlined in the assessment plan • Creation of some standard assessment instruments to be used in library classes • Design and implementation of research studies focus on library instruction	• Assessment Plan public on GUS website • Policies and procedures related to teaching on GUS website • Set of assessment tools for use by all librarians teaching courses • Publications and presentations on library instruction assessment	• Make assessment data public and transparent in a yearly report • Generate special reports for major partners (LEAP, WRTG etc.) • Use of assessment data to change/improve teaching practices • Documented improvement in teaching quality through peer observations	• Increased teaching requests and partnerships • Increased number of general education courses including the Information Literacy LEAP outcome • Increased partnerships with other types of faculty-librarian partnerships (grants, publications, co-teaching projects, train the trainer projects) • Presence in the library literature of U of U library publications and presentations • Increased grants for library instruction once we have data to use	**Assessment** • Demonstrated the value that library/research instruction brings to students, programs, departments, colleges through formalized assessment: • Changed teaching and assessment culture in the library • Elevated the level of respect across campus for librarian teachers



GUS planning Logic Model [Compatibility Mode]

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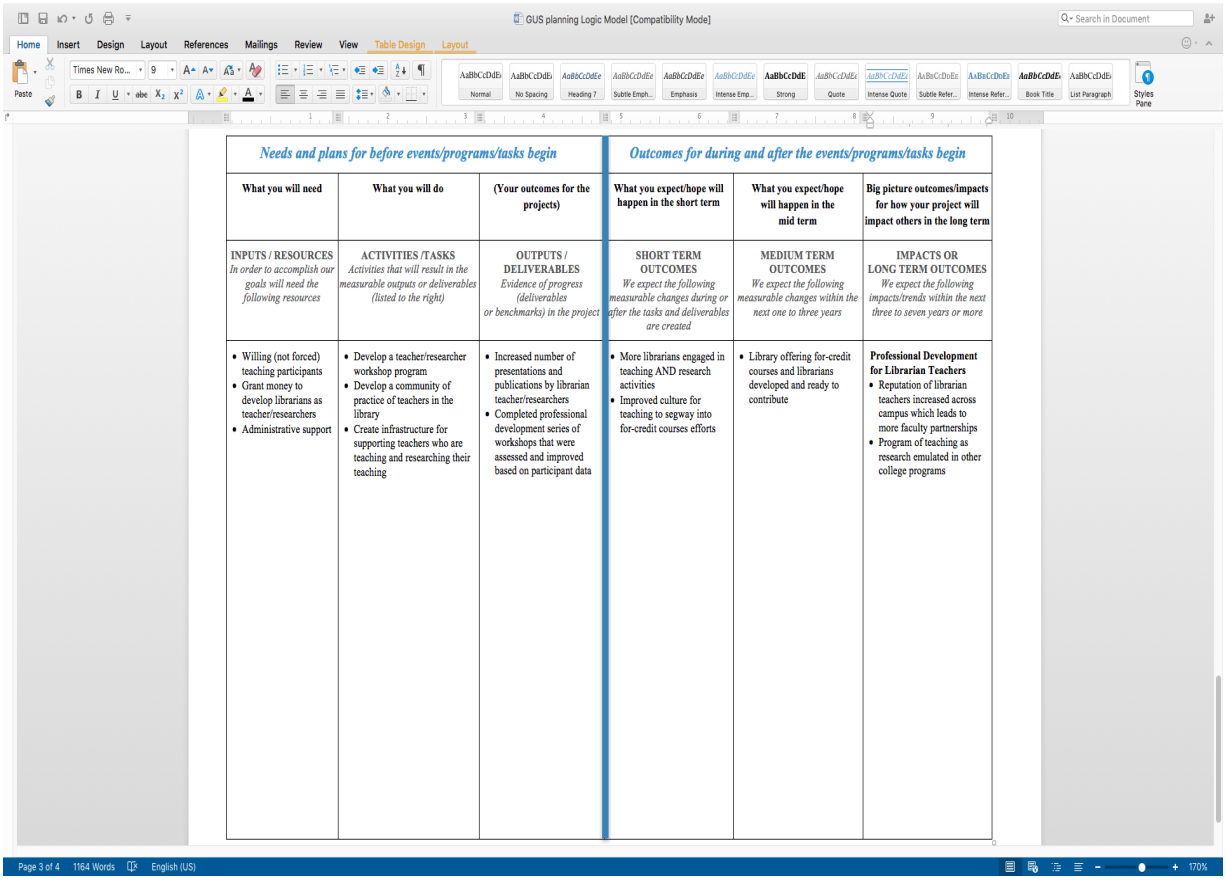
• Budget for swag and materials for outreach events • Staff outside of GUS willing to participate in outreach activities with K-12, community and college students	• Finalize policies and procedures for outreach • Get outreach form for registration and tracking of outreach requests and work up on the web • Design of assessment tool for measuring the success of outreach efforts • Design a MOOC for outreach into K-12 Utah schools	• More efficient flow of how outreach requests are handled, implemented and assessed • More visible presence of library in outreach activities •	• Improved way to measure outreach efforts are in place • Increased high school to college outreach efforts in the area of research and information literacy	• Increased involvement in campus-wide outreach projects • Outreach efforts are more student-centered focused and not marketing focused • Successful grant projects to develop a high school outreach program for developing researchers	**Sustainable Outreach Program:** • Became a valued outreach partner • Continued presence and partnership at all student and family outreach events • Became outreach leaders on campus • Documented contributor to recruitment of students through outreach activities



GUS planning Logic Model [Compatibility Mode]

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• Willing (not forced) teaching participants • Grant money to develop librarians as teacher/researchers • Administrative support	• Develop a teacher/researcher workshop program • Develop a community of practice of teachers in the library • Create infrastructure for supporting teachers who are teaching and researching their teaching	• Increased number of presentations and publications by librarian teacher/researchers • Completed professional development series of workshops that were assessed and improved based on participant data	• More librarians engaged in teaching AND research activities • Improved culture for teaching to segway into for-credit courses efforts	• Library offering for-credit courses and librarians developed and ready to contribute	**Professional Development for Librarian Teachers** • Reputation of librarian teachers increased across campus which leads to more faculty partnerships • Program of teaching as research emulated in other college programs

Collaborative Libraries Assessment Across a Multi-Campus College

Tanner Wray and Cynthia Pfanstiehl
Montgomery College, USA

Nancy Fried Foster
Ithaka S+R, USA

Abstract

Montgomery College conducted ethnographic studies of four campus libraries on its three campuses to understand student work practices and to design improved library spaces and services. This paper describes the highly collaborative assessment approach to the in-depth ethnographic project on community college library use. For each campus, several assessment groups were established and facilitated through a process to complete the work: (1) library and college employees completed ethnographic studies; (2) anthropology students and honors students completed complementary ethnographic studies; and (3) stakeholder groups of college officials provided feedback on the project approach and on findings and implementation proposals from the library and anthropology studies. Training of student and staff researchers is described, as well as the methods by which non-specialists were enabled to gather and analyze data. Key findings and outcomes are presented. The organizational and personal impact of including a large number of participants as researchers, stakeholders, and respondents in the studies is explored. The project offers a replicable model for college-wide collaborations among administration, libraries, campus planning, and academic departments leading to customized breakthrough strategies for student-centered learning.

Introduction

From 2013 to 2016, Montgomery College (MC) conducted ethnographic studies of four campus libraries on its three campuses (Rockville in 2013/14, Takoma Park/Silver Spring in 2014/15, and Germantown in 2015/16) to understand student work practices and design improved library spaces and services. As the community college of Montgomery County, Maryland, Montgomery College is dedicated to the academic and vocational success of over 60,000 students. The libraries play a significant role in the institutional mission, supporting the curriculum and ensuring that students have the information resources they need and the workspaces and conditions under which to use those resources. Basing this project on earlier work completed at the University of Maryland,[1] project leaders believed that a better understanding of student work practices and needs would increase the ability of the libraries to help students complete their academic work successfully.

Creating a Structure for Collaboration

The Montgomery College project, like the one at the University of Maryland from which it stemmed, comprised participatory design activities conducted by librarians and library staff (led by anthropologist Nancy Fried Foster) and complementary ethnographic studies conducted by classes of anthropology and honors students (led by anthropology professor Cynthia Pfanstiehl and her anthropology colleagues), as well as design work based on study findings by architecture students (led by architecture professor Shorieh Talaat). Moreover, the library director (Tanner Wray) recruited stakeholder groups on all three of the college's campuses to provide guidance to the project and to disseminate findings and bolster outcomes. Stakeholder groups included representatives from major administrative and operational units, as well as librarians and members of the academic staff.[2] Overall, the structure of the program created ties among a large number of individuals and departments throughout the college while providing innovative teaching and learning opportunities and producing data upon which to base improvements to libraries on all three campuses.

Indeed, all project partners were critical to the success of the enterprise. The library director, employees, and a project consultant provided

leadership and planning. An anthropological consultant conferred on the project, provided training in data-collection methods, data analysis, and interpretation for the library-based ethnographic study. Anthropology faculty designed and delivered new course material, enabling partnership with student-researchers to emerge out of classroom activities. Similarly, architecture faculty incorporated project-related activities into coursework, engaging their students, too, as project partners.

At the institutional level, Montgomery College's Central Facilities, seeing the potential of the project to support long term facilities planning, provided partnership in the form of funding as well as input via the stakeholder groups. The Montgomery College Foundation provided an initial grant to fund training for library employees. College administrators provided support through strategic plan initiative funding as well as participation in stakeholder groups. Many other members of the Montgomery College community participated in the stakeholder groups, both to achieve wide representation across student, faculty, staff, and administration and to include individuals who were particularly interested in the project and eager to contribute. The broad and complex set of partnerships created a framework for collaboration and was a major factor in the success of the project.

Success Factors and Replicability

Creating a framework for collaboration was a significant success factor for this project. Another was making a commitment to genuine participation, that is, to engaging people in information-gathering activities not as window dressing but because their contributions were considered to be essential to good planning and decision making.

Training for novice researchers was another success factor, both for library personnel and anthropology students. The expertise of anthropology and architecture faculty, as well as the consulting anthropologist, were essential to the project's success. We note that, as in such studies generally, the information gathering itself can be manageable for the trained novice whereas the development of questions and the analysis and interpretation of the resulting information is extremely challenging for anyone but a trained and experienced researcher. Moreover, the complexity of the collaboration meant that strong project management was essential to the project's success.

Montgomery College modified the University of Maryland collaborative assessment model for use at a multi-campus community college. At the University of Maryland, the model was deployed on a single campus, to study a single library, using graduate students as research and design partners to complement the library-led research. At Montgomery College, the model was deployed across multiple campuses and four libraries, using community college freshmen and sophomores as research and design partners to complement library-led research. Another modification at Montgomery College was the expansion of stakeholder group membership beyond administrators to include faculty and other employees. If the success factors noted above are in place, the project offers a replicable collaborative assessment model for college-wide collaborations among administration, libraries, campus planning, academic departments, and students.

Ethnographic Studies Done by Library Teams

Montgomery College Libraries initiated, hosted, and coordinated the project and conducted ethnographic studies on four sites, engaging more than 1,000 members of the MC community in research activities and stakeholder groups.[3] Importantly, the ethnographic studies had two significant characteristics. For one, the studies gathered extensive, actionable information upon which to base library improvements. The other, equally important, was to bring together people in widely varying roles from many different units across the college's three main campuses to conduct the studies, reflect on the findings, and envision change. It is this dual nature of the project's assessment methodology that we consider in this paper.

The participatory design approach used in this project is a particularly apt choice for such a project because it intentionally considers the whole community as equal stakeholders in a design process, albeit with different forms of expertise and complementary or even divergent interests.

Participatory or user-centered approaches have been used extensively in library technology and space design, especially since the 2005 publication of a study of faculty use of grey literature in connection

with the design of the institutional repository at the University of Rochester.[4] That study demonstrated the value of understanding academic work practices before developing software requirements. The additional benefits of participatory design—the increased connection and engagement among librarians and academics—were described two years later with regard to a study of undergraduate work practices at the University of Rochester.[5] Both benefits were explicitly sought in the Montgomery College project; that is, the assessment was designed to develop information and collaboration at the same time.

Project leaders recruited project teams successively on all three campuses to conduct research activities and help analyze and interpret results. Each team included librarians and library staff as well as representatives from other associated organizations: Grants and Sponsored Programs, a Writing, Reading and Language Center on one MC campus, and a Writing Center on another. The non-library team members increased the size of the team, and therefore how much research they could conduct, and provided helpful, semi-outsider perspectives.

As each year of the project began, the campus-specific team received training in the objectives of the project, the ethnographic approach, and the methods. The main methods were:

- Reply cards: short surveys printed on cards that were handed out in designated seating areas *within campus libraries*. The cards asked what students were doing, whether they were working alone or with others, why they chose their particular location, and a few other questions.
- Brief interviews: used *in non-library campus locations* to find out about students' most recent work sessions (where they were, why they chose that location, what they did, and several other questions, including questions about the last thing they read for a class).

Additionally, teams at two of the campuses conducted design workshops in which they had faculty members, librarians, and students draw pictures of an ideal library space and then asked them questions about what they imagined themselves and other people doing in the depicted spaces.

The project team analyzed and interpreted the data and learned, first of all, that there were some differences but also marked similarities across the three campuses.[6]

In brief, the team discovered that the library provides a special place for students in which they can give their attention to their studies without distraction. For some students, there are few alternatives. Many students have work and family responsibilities that leave little time for studying, so they make careful use of their time on campus, grabbing even short stretches of study time when they can.

Students value the library as a study space for its atmosphere of quiet concentration and focus, appreciate the furnishings, access to outlets, and good Wi-Fi, as well as noise dampening and soothing décor. Students indicated that they seek spaces that allow them to feel welcome and secure.

Most of the students in both the library survey and the campus interviews were working alone. Many students sat with others but did not necessarily know them and did not work with them.

The wide range of programs offered by Montgomery College leads to a very wide range of reading material for students. Many students are in academic programs and read online articles, often on the recommendation of their professor or instructor. Some students read only the textbook. A few read charts and other job-related explanatory material or magazine articles and other popular reading material because these are the most important resources for their programs. Most students, even those who regularly study in the library, reported that they had last done some reading for a class at home rather than in a library or other campus space. Moreover, most of them did that reading on a screen rather than a tangible book or journal. Similarly, even students working within the library reported using online and onscreen materials rather than tangible materials.

The information gathered during the three years of the study enabled the project team to develop qualitative requirements for the improvement of spaces in Montgomery College's four libraries, some of them relating to basic infrastructure (more outlets) but many more related to designing spaces that enable students to work with standard technologies, get help when needed, use the many resources the libraries provides at no cost, feel

inspired, and focus on the work at hand rather than their many other cares.

Ethnographic Studies Done by Anthropology Students

Anthropology professors and students developed and conducted complementary ethnographic studies of the four Montgomery College Libraries. The college's four full-time anthropology faculty established the following research questions for the project:

1. How do students and faculty typically use the Montgomery College Libraries?
2. What are the needs and expectations of students and faculty when using the library?
3. Are there aspects of library services and programs that might work better if improved or modified?
4. How do students and faculty feel about working in and enjoying the library space?
5. Are there aspects of the library space (visual, spatial, auditory) that could be improved to better facilitate concentration, comfort, and aesthetic appreciation for library users?

Two methods were deployed: structured interviews and in-library observations; overall they engaged hundreds of members of the MC community.[7] The interview and observation forms, associated classroom assignments, and the methods for analysis and modeling were developed by the college's full time anthropology faculty. Cross-campus implementation also required the involvement of three part-time faculty members and an honors faculty member. Across all three campuses, this study involved 260 students from twelve ANTH 201: Introduction to Sociocultural Anthropology classes. Student researchers participated in the data collection and analysis for this project. In addition, the project involved eleven ANTH 201 students from the Montgomery Scholars Program, four students from the ANTH 201 Honors Module, and fifteen students from the Renaissance Scholars Program.

A questionnaire with eighteen questions for structured interviews was developed by anthropology faculty and students and tied closely to the research questions. Student researchers conducted scheduled, structured interviews at various non-library locations throughout the campuses. Two researchers were present at each interview: one student took the role of interviewer, asking the questions and prompting the interviewee for additional information; the second researcher recorded the responses of the interviewee on the questionnaire form. No voice or video recording was done.

- Structured Student Interviews. Each researcher selected one or two students outside their anthropology class to interview.
- Structured Cross-Section Interviews. These interviews provided data on smaller sample groups that represent a cross-section of the campus communities. Sample groups included general full-time and part-time faculty, students who have accommodations with Disability Support Services (DSS), students in the American English Language Program, evening students, students who are military veterans, nursing students, nursing faculty, and arts faculty. Cross-section groups that were selected varied by campus. However, faculty members and students who have accommodations with Disability Support Services were interviewed at all campuses. The perspectives from the cross-section sample groups proved to be an important element of the anthropology study.
- Observations. Librarians designated specific areas within each library to be observed. Areas were defined by their location and function, and the services, equipment and resources available. Student researchers made observations throughout a typical week during morning, afternoon, and evening sessions. In one observation approach, student researchers observed library users for a 30-minute period, recording activities and use of space by those users in a specific library area using codes. In a second observation approach, student researchers observed one of the designated library areas for a 30-minute period and recorded and counted the entrances and exits of library users. They also described the activities that occurred within the area.

The findings of the anthropology students' studies indicate that each library facility is quite different and has its own set of very specific needs, but there were common recommendations across the three campuses.[8] One common recommendation is to improve access to technology, with an emphasis on increasing the number of library-provided computers and electrical outlets. The library could also explore students' understanding of reserve materials and their limited utilization of tutorials, course pages, and other online resources. Similarly, the library could find ways to reach out to students who do

not already ask for assistance from staff. Study findings also suggested a range of improvements to the facilities themselves. These include updating furniture, adding comfortable seating, making the library more colorful, and adding artwork; providing different types of workspaces in the library with varying sizes and shapes of tables and different layouts; finding ways to reduce congestion in the most heavily used areas; and improving lighting, especially in areas that are noticeably dim.

Students in the anthropology classes realized a number of benefits from conducting the ethnographic studies. The 290 students examined library spaces, services and programs that are essential to student academic success. The findings show that in addition to providing academic support, a campus library has other significant functions at a community college. It may serve as a calm, inspirational place where students and faculty alike can relax between classes, peruse materials for their own personal interest, or catch up with friends or colleagues.

Conclusion: Implementations and Benefits

The design of libraries is constrained in many ways: by brick-and-mortar construction, existing systems, and financial limitations that lead to piecemeal improvements and retrofitting. But library design can be responsive to the needs of the community, by providing evidence of current and emerging work practices and needs, which in turn supports a longer-term view of the future library and creates a path toward achieving that future. Given the constraints, we argue that the collaborative assessment approach deployed at Montgomery College provides not only added but necessary benefits. That is, given the structural, systemic, and financial obstacles, the odds of the library successfully implementing broad changes are good only if there are established, cooperative relationships among stakeholders. It is not enough to collect some facts. It is necessary to build collaboration all along the way.

To build effective collaboration, a project must provide meaningful work. The anthropology faculty were charged with developing a framework for a groundbreaking study. The opportunity to contribute to a collaborative, college-wide project, uncommon for community college faculty, was another welcome benefit. As project researchers, students learned the methods of their field and applied concepts acquired in the classroom to real-world situations. Students were eager and proud to be included as part of the research and design teams. The collaborative approach employed in this study empowered students to use the library as their laboratory to interview, observe, recommend, and design change in their own campus library. Several of the students went on to give presentations at a regional honors conference.

Participants from the Montgomery College Libraries enjoyed more direct interaction with students and faculty and heard their thoughts and preferences about library spaces. Employees gained research and data presentation skills, and presented and published their work at community college and library conferences. The structure of the collaborative assessment approach fostered more meaningful relationships among library employees, faculty members, and administrators across the college.

Stakeholders commented that the opportunity to examine data produced by the students, coupled with the opportunity to share reactions with others in cross-disciplinary stakeholder groups, was very valuable. The wide range of stakeholder representatives from various departments and divisions contributed to an environment of mutual interest, understanding, and respect among areas that do not normally have an opportunity to participate collaboratively on a student-focused project. Stakeholders also observed that, through this project, the MC Libraries made substantial contributions to college planning processes and voiced support for the libraries to continue and expand these student-centered contributions. The management of this complex collaborative assessment project increased respect and prestige for the library and increased its understanding of its role in student success and completion.

The project ultimately resulted in a stronger college-level understanding of student needs and the role the MC Libraries fill in supporting student success. The MC Libraries have established themselves in a new role at Montgomery College—both as research leaders and partners, and as a social science and design lab for student learning and original research. The collaborative assessment approach led to customized breakthrough strategies for student-centered learning. The college-wide qualitative assessment partnerships between administration, staff, faculty and students are informing the design of

learning spaces and services at the college, including the reprogramming of several library spaces.

> I believe this project has afforded the opportunity not only to improve the campus library but has also created a window into the culture surrounding the library. This helps perpetuate student engagement and eliminates steps in the trial and error process. I think the continuation of this project will set a precedent for many other schools.
>
> —Montgomery College Student

Endnotes

1. Patricia A. Steele, David Cronrath, Sandra Parsons Vicchio, and Nancy Fried Foster, *The Living Library: An Intellectual Ecosystem* (Chicago, IL: Association of College and Research Libraries, 2015).

2. Each year, a stakeholder group was convened for the campus under study to provide feedback on the project approach and on findings and implementation proposals from the library and anthropology ethnographic studies. Each group had an average of over 20 members, with a total of 65 stakeholder slots across all three campuses filled by 54 different individuals. Stakeholders included vice presidents, department chairs, full- and part-time faculty, and student services, security, and assessment personnel.

3. Research and stakeholder activities conducted by library teams over the three years of the project included 911 students, 56 faculty members, 42 library employees, 19 administrators, and 41 other Montgomery College employees.

4. Nancy Fried Foster and Susan Gibbons, "Understanding Faculty to Improve Content Recruitment for Institutional Repositories," *D-Lib Magazine* 11, no. 1 (January 2005), DOI:10.1045/january2005-foster.

5. Helen Anderson and Ann Marshall, "What an Experience: Library Staff Participation in Ethnographic Research," in *Studying Students: The Undergraduate Research Project at the University of Rochester*, eds. Nancy Fried Foster and Susan Gibbons (Chicago, IL: Association of College and Research Libraries, 2007), 55–62.

6. The library findings are detailed in the three yearly reports and summarized in a capstone report. Montgomery College Libraries, "Montgomery College Libraries Ethnography Study," 2016, cited September 23, 2016, http://libguides.montgomerycollege.edu/ethnographic.

7. Research activities conducted by anthropology students over the three years of the project included 290 student researchers, 306 student interviewees, 8 faculty members teaching and facilitating the project, and 23 faculty interviewees.

8. The anthropology findings are detailed in the four reports and summarized in a capstone report. Montgomery College Libraries, "Montgomery College Libraries Ethnography Study," 2016, cited September 23, 2016, http://libguides.montgomerycollege.edu/ethnographic.

Event Evaluation: Developing a Rubric for Assessing the Value of Library Programming

Maurini Strub and Melissa Laning
University of Louisville, USA

Abstract

This paper covers the University of Louisville Libraries' experience with developing tools and a rubric for assessing events sponsored by one of the campus libraries. It provides background information about the local environment, outlines a conceptual framework developed for understanding event assessment, and briefly describes the tools that were designed for that purpose. It also describes some of the organizational barriers that were encountered as the assessment plan was shared within the organization. It serves as a reminder that creating a culture of assessment involves much more than introducing specific tools and methods for gathering feedback. It requires an organizational commitment to learn how well and what good is accomplished though the delivery of collections, programs, and services.

Introduction

Events programming at the University of Louisville (UofL) Libraries has always been considered a means for the unit to contribute to the vibrant intellectual climate on campus and create a welcoming environment for users. Over the years, the libraries have initiated and hosted a broad range of activities in our facilities, including exhibits, receptions, lectures, presentations, workshops, and open houses. During a period of organizational transition, this approach came under administrative scrutiny, and event assessment was recommended as a means of refining the future direction of the libraries' events programming.

Context

The previous dean of libraries strongly encouraged events as one method of generating visibility for the libraries. Her underlying premise was that increasing the number of events held in library facilities elevated the libraries' campus profile. It was believed this would increase the university administration's perception of library value and eventually result in greater investment via budget increases. Another administrative tenet affecting the volume of activity was that building relationships with external academic and support units was critical for reaching our long-term goals of administrative investment. As such, collaborations with other units, regardless of the libraries' role in event planning or execution, were encouraged and rewarded. Compounding these issues was an ad hoc infrastructure supporting events that drove a distributed decision-making culture. Library directors, librarian liaisons, and a very active exhibits committee were all empowered with initiating and hosting events.

For a period of time, this approach appeared to be quite successful. The number of events increased and the libraries experienced increased traffic. Librarians were rewarded for their efforts and believed that they had accrued positive social capital with campus colleagues. Campus surveys validated that the libraries were held in high regard by the campus community, and the libraries enjoyed good support from the university administration. It is impossible to determine if any of these conditions were related to the increasing number of events held in the libraries, but it was a highly self-justifying system.

By the time a new Dean arrived in early 2011, this approach to events programming had become, in many respects, a victim of its own success. With so many different people involved and the lack of coordination, events were being scheduled when the buildings were closed, rooms were being double-booked, and the libraries' technology, public services, and facilities staff were spending hours each week responding to "emergency" help requests from outside groups who viewed libraries' personnel as their conference center support group. Because the issues were the most pressing in the largest of the campus libraries, the library director convened an events work group to manage the calendar and logistics for all events in that facility.

For the first time, one central body was charged with coordinating events, spaces, and resources. The group started meeting weekly and consisted of the library director, the head of access and user services, and two individuals closely involved in room scheduling. Their first tasks were to develop a schedule of all routine, ongoing events and to coordinate planning with event sponsors for future events. This allowed them to be better prepared for those ongoing events the libraries had long-standing arrangements to support. The group also rigorously reviewed incoming requests for new events and determined whether the libraries could accommodate their building use needs. Finally, they identified key library personnel for each event's management and shifted responsibility for security, maintenance, and other physical labor to the event planners. With these nominal changes, it was clear that, although some of the events were related to local collections and services, others had tenuous connections at best. Being charged to take a more focused and strategic approach to events planning allowed the group to say no to requests that were outside the scope of the libraries' strategic plan, particularly when the requested event placed significant demands on library resources. Within a year of when the group started, there was a clear decline in both the number of new events taking place in the library and the amount of situational drama that occurs when things go wrong. Additionally, the events that were taking place were better planned, better resourced, and more connected to the mission and goals of the library.

Building a Tool

Despite the many positive changes made to the logistics and scheduling of library events, assessment was not being used to help the group get feedback on events programming. As such, the authors volunteered to develop instruments to assist the events coordinators with understanding how well they were doing and where there were opportunities for further improvements. They envisioned the final outcome would be similar to the program evaluation forms that are a standard feature at most conferences, augmented with more casual onsite tools such as whiteboards or guest books.

The library literature provided a number of useful, thought-provoking, and holistic approaches related to event assessment, particularly in sources about public library programming. Sources from the business literature also provided invaluable guidance for understanding how to measure event performance. In both librarianship and the business world, the concept of Return on Investment (ROI) with respect to events led to thinking about the success of events more broadly than originally conceived. If ROI was at the core of the transformative change in events coordination at UofL, the ability to assess it would greatly enhance assessment efforts.

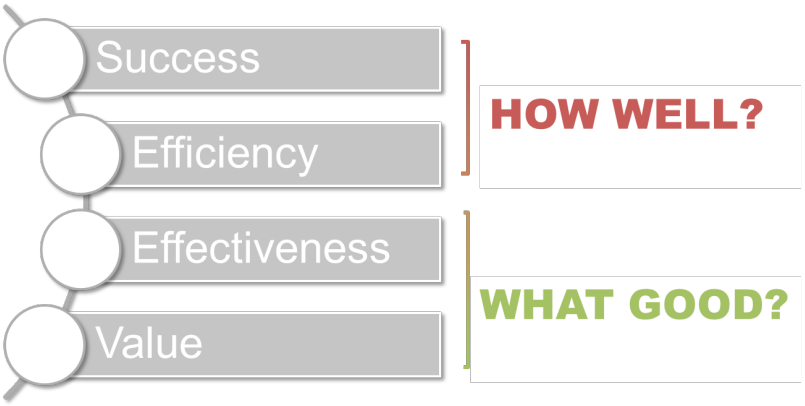
The authors then focused on learning more about the purpose and history of events the libraries were already hosting, such as an annual Dia de los Muertos display that filled the first floor lobby with altars and kites created by introductory Spanish classes to pay tribute to the deceased. Structured interviews were conducted with the library contacts for five representative events derived from the compiled events schedule. During these interviews, they asked planners a set of questions about the history of the event, its goals, success indicators, and their perceptions of the value to the libraries for hosting the event. These conversations were very pivotal in the development of an initial conceptual model for assessing the libraries' events. One of the key findings from these interviews was that the desire to build and maintain relationships with campus partners was often the primary goal of hosting the event from the library planners' perspectives. Although the planners had little evidence that event collaboration led to more frequent or deeper collaborations, they were highly certain of their value. Another important finding was that libraries' personnel frequently had little, if any, involvement in overall event decision making.

An early conceptual model (Figure 1) emerged from the literature review and interviews with colleagues that had four dimensions for assessing events. As the authors developed a bank of questions and suggested methods (a toolkit) for collecting information related to each dimension, it appeared that the categories were not quite as distinct and encompassing as initially thought. Some questions seemed to fall in multiple categories and others did not fall neatly into any of them. After further analysis of the model and its four dimensions, it appeared there were two broad domains relative to event assessment that needed to be captured: "How well did we do?" and, "What good did we do?"

The "How Well" measures covered the quality of the event and core issues of performance. Many

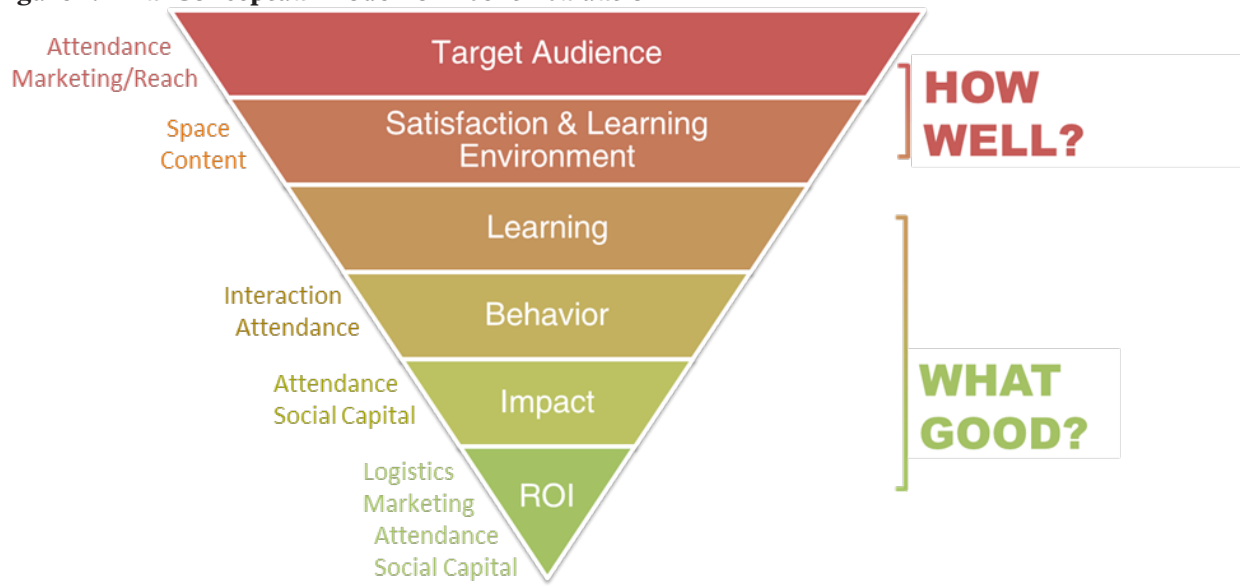
event evaluations focus exclusively on these issues, however, a comprehensive and robust event assessment should focus on both. Beyond performance issues, the "What Good" questions addressed impact and value. The relationship between these two domains is hierarchical, such that, if the quality (How Well) threshold has not been met, having a positive impact and value (What Good) are unlikely to be achieved.

Figure 1. Early Conceptual Model for Event Evaluation



The current working model (Figure 2) overlays the How Well and What Good domains on Hamso's six dimensions.[1] In this hierarchical model, the new dimensions offered better-defined categories than the previous model and greater granularity for exploring the two broader domains. The How Well domains were expanded to two dimensions. The first, Target Audience, covered not only how many people attended an event, but the impact of marketing on reaching and attracting the target audience. The second dimension, Satisfaction and Learning Environment, measured overall satisfaction with the event content and space. In the What Good domain, the Learning dimension tackled measuring participant perceptions of their learning at the event, while the Behavior dimension aimed to capture whether the event influenced participants' attendance at other events or their interactions with planners following the event. The Impact dimension measured whether event sponsorship had any effect on our relationships and whether the event led to other opportunities for collaboration with partners. And the final dimension, ROI, zeroed in on the return on investment in publicity and marketing, logistics, and building social capital.

Figure 2. Final Conceptual Model for Event Evaluation



A toolkit, within the framework of the new six-dimensional model, is currently under development with lists of questions and data collection templates that a program planner could use to customize an assessment instrument or set of instruments based on the purpose and scope of any given event. This customizable toolkit will reside on a shared network where event planners will draw from the question and methods bank and essentially create their own assessment plan on a case-by-case basis without having to fully reinvent the wheel for each event. During the initial year, the user experience/assessment librarian will work closely with event planners as they use the toolkit to determine which questions have been productive for them, which ones need refinement, and which should be abandoned. Ideally, the event planners will add to the question list for use by other future planners. Assessment's role will eventually be to track which evaluation methods/templates are favored by planners and elicit the most insightful responses, and modify the toolkit as needed.

Implementation

When the conceptual model for event evaluation and preliminary measurement tools was ready to be shared with colleagues in the organization, it became an agenda item at a monthly meeting of library department heads and other functional area specialists. What was expected to be a limited engagement agenda item turned into a very animated and lengthy response to the model and the toolkit of proposed questions and assessment instruments. In presenting the proposal, the authors focused on the model and ended up priming meeting attendees for a more philosophical conversation about event evaluation, rather than focusing on barriers to incorporating the tools and limitations of specific tools. Despite the inadvertent priming, the meeting attendees still provided a number of practical ideas for improving the end product based on their experiences on the front lines of event planning.

Although the proposal recommended fairly low stakes methods, there were still a number of comments about assessment introducing unnecessary complications into event planning. Program evaluation was perceived as burdensome and a barrier to adoption when it was assigned to planners instead of an assessment librarian. Sustainable, best practices from an assessment perspective were not considered to be a positive value for the individuals who were now responsible for the work. Others expressed concerns about the methods being overly intrusive and alienating to attendees. At the end of the discussion, it was clear that they wanted low-effort and unobtrusive tools for capturing assessment information, particularly for smaller events. Additionally, there was apprehension about where the data would reside and wariness about how it would be used. For meeting attendees, the goal of event evaluation was unclear—was it to provide data that would allow them to refine their events, or to determine

which events should continue? This uncertainty reflected a larger issue; the conceptual model had struck a nerve regarding the organizational culture around events management, which had not been as closely managed.

Beneath the somewhat natural reaction to having their events evaluated for the first time, it was clear that many of the library department heads were still using the previous dean's vision of events as their guide for event planning and defining success. For example, one person indicated that use of the library's space by other departments was an indication of success as a liaison. Another expressed that being considered a good partner was the gold standard for event planning. Another underlying theme was a fear of losing the autonomy for event planning that was a hallmark of the previous approach. Although there had been an emphasis on coordinating event logistics and calendar management for more than a year at the proposal presentation, the model for event evaluation highlighted coordination of purpose in a way that had not been explicitly addressed. A third very strong theme was concern that evaluating success and impact would impose limitations on *potentially* valuable outcomes, outcomes that might not materialize until well into the future, and, relatedly, whether assessment could possibly measure the *true* value of events. These ideas were reminiscent of the provocative beliefs articulated in the 2015 Southeast Library Assessment Conference keynote address, specifically that assessment can get in the way of innovation and erode the academic social contract of being free to try and fail.[2]

The analysis of the comments collected during the presentation of this proposal revealed a great deal about the organization's readiness for an event evaluation program. Despite the successful and largely unquestioned work of the events work group, nominal attention had been paid to managing the human aspect, and the friction shared during the meeting was clearly in response to an organizational change that did not have strong buy-in. The power of organizational culture and attachment to existing values had been underestimated, even though it had been articulated during the interview phase. Although these interviews revealed obvious disparities between the planners' and administrators' goals and success indicators, it was naïve to think that assessment could be the bridge between the two. Assessment is a powerful tool for providing organizational information that can be used to inspire or drive change, but it cannot replace an old vision with a new one. Alternatively, more time could have been invested interviewing all the key stakeholders, allowing emphasis to be placed on measuring progress toward shared goals instead of focusing on measuring progress in areas where stakeholders were not on the same page. With further reflection and analysis of the feedback, the toolkit was redesigned to include many more methods that do not require direct engagement with attendees. The overall conceptual model, however, remains unchanged.

Event Evaluation in the Wild

Despite the challenges to implementing event evaluation at the main library, the decision was made to pilot the model during the 2016 fall semester. Kick Back in the Stacks (KBitS) is an annual social event held in the main library since 2013. It was created by First Year Initiatives, a subunit of Undergraduate Affairs, and is scheduled for the Friday evening before the start of classes. Over one thousand students show up for fun activities, food, and informational stations. KBitS has high visibility among undergraduate students and has strong potential for relationship building with an important unit on campus.

A scaffolded approach to implementing the model was recommended for the pilot, focusing on the How Well domain with a small foray to measure What Good issues. To capture feedback on the Satisfaction/Learning Environment dimension, a memory wall was mounted on a large glass surface near the exit with the prompt "My Favorite Moment Tonight Was..." Guerilla voting was also incorporated to provide a low effort and non-disruptive way to identify preferred experiences. Using Google Forms, an icon-based survey was created to help speed up the voting process, and staff armed with tablets approached students as they exited the events. With subsequent iterations, either new dimensions or new facets of a dimension could be folded into the program's assessment to collect more complete information about the performance and impact of an event.

In the What Good domain, the libraries will use the card swipes collected by First Year Initiatives as students entered the building to look at behavior. These card swipes capture student names and identification numbers and will be compared with other library data to examine relationships between

first-year student use of the library and attendance at the KBitS event. For this event, future low-hanging fruit might be adding the attendance dimension, as its event planning is highly coordinated and heavily marketed.

Next Steps

A rubric for evaluating performance for each dimension is currently under development. The rubric's primary goal is to improve performance and, as such, will take an analytic approach for each facet of the dimension. There will be a three-point scale of "beginning," "proficient," and "transformative," with distinct and detailed descriptions for each facet, providing a clear path for improvement. The rubric may also be used to make future decisions about continuing or abandoning events. Plans are now underway for additional pilots in the 2017 spring semester for different types of events. Over time, the toolkit will contain customizable assessment tools to address all the dimensions of the model, and the original goals of the project will be realized.

Notes

1. Hamso, "ROI Methodology."

2. Ludovice and Bennett, *Consilience with Pete and Charlie*.

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Assessing Your New Library Position: A Story about Creativity, Collaboration, and Collegiality

Amanda B. Albert
Saint Louis University, USA

Abstract

Purpose: The purpose of this paper is to demonstrate how librarians can use assessment to determine the needs of colleagues in order to provide direction for new professional roles.

Design/Methodology/Approach: Eleven librarians were interviewed and surveyed gathering data using mixed methods assessment.

Findings: Results include providing direction for the research instructional services department, creating valuable programming, and inviting more transparent relationships.

Practical Implications: This creative approach to internal assessments allows librarians to make evidence-based decisions within library departments regarding professional development.

Introduction

To set the scene, picture a budding library professional graduating with her MSLIS in 2014 and heading out to the job market. After a few stops and starts, she settles on a full-time position as the instructional services librarian at Saint Louis University, a mid-sized, four-year institution in St. Louis, Missouri. This job is brand new to the librarian as well as the library, but the librarian is ready to jump in feet first.

Cut to one month into the position: our professional librarian has learned a lot, is just beginning to navigate the places and politics of her new institution, and has taken on minor responsibilities. She has the freedom to design the new position as she pleases, and relishes the thought! But she cannot shake the feeling that something is not right. Without the guidance that an established position affords, she is not sure what she is supposed to be doing with her time. Is this all there is?

One year later, this librarian has assessed her way into her job using mixed methods assessments and by collaborating with colleagues in and outside of the library. By closing the loop on these assessments, she has established herself as a trustworthy colleague, built a cache of short- and long-term goals and projects, and begun developing a team of instruction librarians eager to work together in a community of practice.

Background

Pius XII Memorial Library is one of three libraries within the Saint Louis University (SLU) library system. It is home to over 1.3 million volumes, houses the Vatican Film Library, and serves over 14,000 students, faculty, and staff across four campuses, including a campus in Madrid, Spain. The three largest departments are Collection Management Services (CMS), Circulation and Information Services, and Research and Instructional Services (RIS). At the time of the initial survey in 2015, there were 12 librarians including the instructional services (IS) librarian in the RIS department. However, personnel changes reduced that number to 10. These 10 librarians teach information literacy across campus. In addition to the librarians within Pius' RIS department, there are librarians within the Medical Center (MCL) and Law libraries who teach within health sciences and law. Librarians in archives and records management and special collections also teach information literacy sessions. RIS librarians taught 323 classes reaching 5,083 students during the 2014–2015 school year and 337 classes reaching 4,880 students during the 2015–2016 school year. It was during the spring of 2015 that the librarians sought to hire a full-time IS librarian to provide guidance to the librarians in the RIS department as well as other teaching librarians within the university libraries. This role provides leadership and expertise in the assessment of the effectiveness of the library's instruction program, monitors the implementation of the ACRL Framework for Information Literacy for Higher

Education, and strives to improve the library's subject-based activities.

The IS librarian arrived at SLU in late September 2015 with the instruction librarians well into their teaching. As a way to become acquainted with the new position and the RIS department's instructional activities, a survey was created and distributed by the IS librarian. Following the survey, the IS librarian developed a program, the Instruction Community of Practice (iCOP), in order to more fully serve the teaching librarians. This program consists of a series of workshops, brown bags, journal club discussions, and informal meetups to discuss various topics related to information literacy instruction. Follow-up interviews were conducted with the RIS librarians at the end of the spring 2016 semester to determine the efficacy of iCOP activities and establish a direction for the future.

Method

There are 23 total teaching librarians within Pius and MCL. All are invited to participate in the iCOP, and do so voluntarily. However, the IS librarian chose to survey and interview only those in RIS, as this is where the main responsibilities of the position lay. The demographics of the RIS department vary. Years of service within RIS range from almost 30 to just one year. Each librarian has subject specialties in which they liaise with anywhere from two to six academic departments. Teaching duties vary depending upon the information literacy needs of liaison departments; however, all but one librarian is required to teach three to five sections of the freshman writing and rhetoric class commonly known as the Freshman Writing Program, or English 1500/1900/1920.

The IS librarian sent the survey at the end of October after informally speaking with each RIS librarian about instruction as part of the orientation process. The librarians had one week to complete it. Qualtrics Survey Tool was used to deliver the survey questions, and results were exported into Microsoft Excel. The IS librarian collaborated with the director of the Paul C. Reinert, S.J. Center for Transformative Teaching and Learning to refine the survey questions. The Reinert Center, as it is called on campus, offers faculty, graduate students, and other educators on campus instructional development services and programming on various topics relating to pedagogy.

The survey questions were designed to:

- Glean the general impression of the RIS librarians' instruction activities
- Understand librarians' feelings about their instruction
- Understand what they hope to achieve as result of working with the IS librarian and/or the Reinert Center
- Record the types of activities they wish to participate in
- Record the types of resources and content they want to explore

The librarians were also given space to include anything else they wanted to share. The results were anonymous unless the individual librarian chose not to remain so; however, the non-anonymized results were undisclosed and not shared with anyone but the IS librarian.

Findings

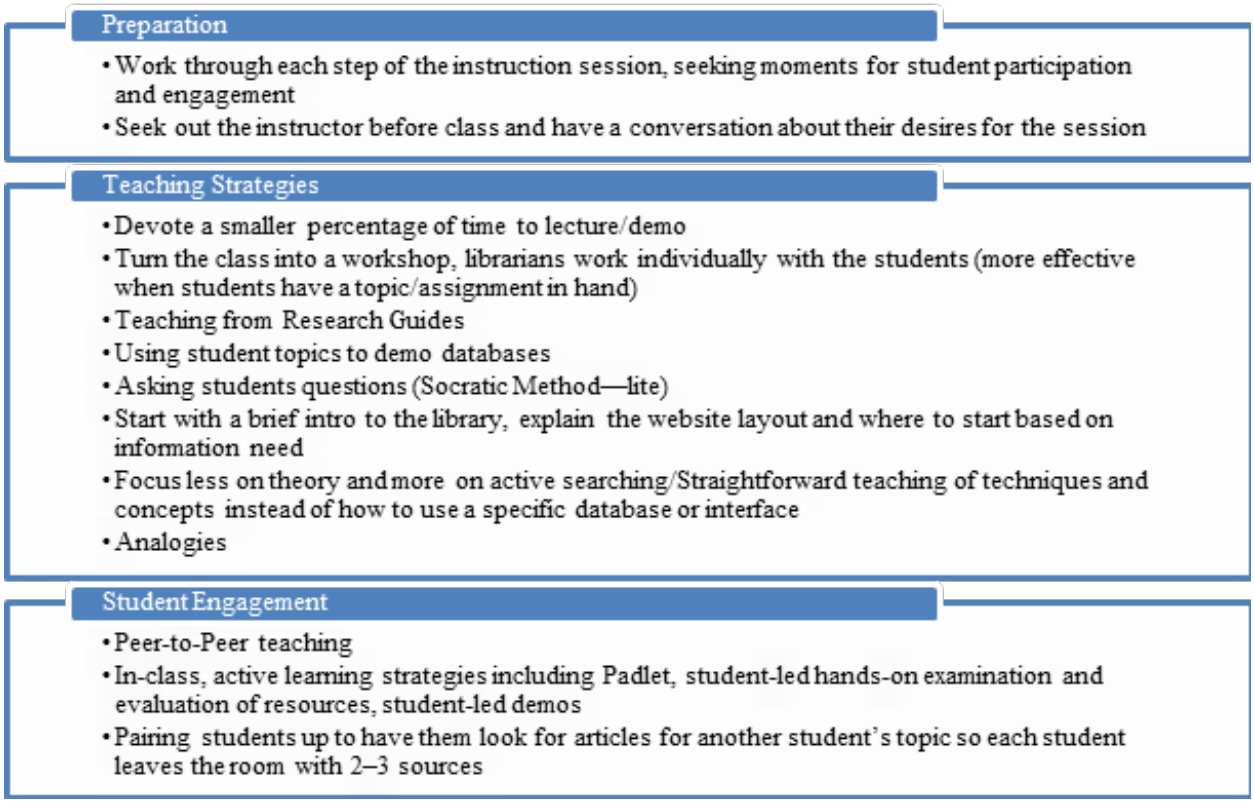
All 11 librarians completed the survey for one hundred percent participation. The survey was divided into three sections based on the types of questions asked. The first section of the survey established the state of the librarians' current instruction sessions. Eight of the 11 felt "somewhat satisfied" with their instruction sessions, and those who elaborated cited a vast number of reasons as to why they were not completely satisfied. The number one reason for dissatisfaction is frustration with the English 1500/1900/1920 classes. Most felt they were more effective teaching within their subject specific areas. These sessions also take place in September, potentially leaving librarians feeling burned out due to the large quantity of instruction sessions taking place within that month. Librarians are also frustrated by faculty who do not communicate effectively regarding the assignment or session learning outcomes, thus making preparing for the session difficult. One librarian felt there was not enough time to go in depth into any topic during instruction sessions, while another cited the one-shot model as ineffective, but was not sure what an alternative would be.

When asked, "*How do you want to feel when you teach?*" (Question 2), librarians had many similar responses. In summary, most wanted to feel effective, knowledgeable, engaging, that they were making an impact on students' skill and comfort levels, and providing them with an enjoyable experience. The responses seemed evenly split between librarian-

centric feelings and student-centric feelings. Both types of responses are valid.

Throughout the survey, librarians expressed an interest in learning what their colleagues were doing in their instruction sessions. Thus, the answers to Question 4 were shared with all RIS librarians as part of the feedback loop. Their answers fell into three main categories:

Figure 1. What is currently working, or has worked well in the past, in your instruction prep, instruction sessions, and/or post-instruction sessions? (Question 4)



Question 5 ("*What would you like to change, or what new strategies or tools are you interested in trying, if anything?*") garnered various responses, from "open to suggestions" to more specific ideas and interests, including:

- Informal discussion
- Informal and formal observation
- Pedagogy
- Assessment
- Intentional design
- Classroom management techniques
- Active learning techniques
- Technology as educational support
- Move beyond demos to teaching information literacy concepts
- Planning
- Communicating value of instruction to faculty members
- Assignment design
- Integrating information literacy into the curriculum via scaffolding

Section Two offered a look into what the librarians' goals were for their instruction sessions, and the outcomes they would like to achieve by participating in activities that may influence their instruction. Librarians stated that their instruction session goals (Question 6) include wanting to provide information literacy skills, which encompasses finding relevant information, using appropriate resources, and understanding and using search strategies. Another desired main outcome of their instruction sessions is to teach students how to get help from the library, which is viewed as a form of outreach. They also want the teaching faculty to understand the value of working with a librarian. Finally, other concepts such as teaching transferable skills, giving students

hands-on practice, and "surviving September" were also goals of instruction sessions.

The main themes emerging from Question 7 ("*What would you like to happen as a result of working with the instruction coordinator/your colleagues/the Reinert Center?"*) were transparency or knowing what others are doing/experiencing as instructors, re-energizing instruction, learning new approaches such as active learning techniques and using technology, connecting learning outcomes to assessment, student engagement strategies, how to create better learning objects, lesson planning or offering pre-made lesson plans or activities to mix-n-match, and working with the new ACRL framework. Other ideas included participating in activities such as workshops, demonstrations, discussions, and formal events through the Reinert Center.

Section Three discerned the types of activities the librarians were interested in doing, and their level of comfort surrounding these activities, including being observed or having an instruction session recorded. Question 8 confirmed interest in a mix between both individual and group activities. Most librarians were willing to share their experiences with others, and less than half would be comfortable with being recorded or observed and receiving feedback about their teaching.

Question 11 asked everyone to choose preferred activities and/or resources they would like to use to learn more about instruction. The top six priorities (four, five, and six were tied) that were chosen are:

1. Informal Discussion Sessions
2. Demonstrations (i.e., technology)
3. Creation of an instruction toolkit in LibGuides
4. Formal Sessions
5. Instruction Sandboxes
6. Peer-to-Peer presentations

The instruction coordinator used the top five answers to the question "*What type of content would you like to discuss?*" to determine what would be the priority in terms of content. This included:

1. Information Literacy Concepts
2. Assessing Student Learning
3. Assessing Instruction Sessions
4. Educational Technology
5. Pedagogy/Andragogy

The IS librarian followed up with the RIS librarians six months later using a formal interview process. These interview questions included:

- What types of classes did you teach this semester?
- What types of activities did you do?
  - What worked?
  - What didn't?
- Overall, what are you goals for instruction, or as an instructor? Next year?
- How have the activities we have done so far been helpful to you?
- What would you like to learn more about?
- What do you want to get out of the group activities?
- As a group, what direction do you think we should be headed? Do we need group goals?
- How can I better support you in your instruction and in achieving your instruction goals?

These interviews illuminated the need for the iCOP to have a more strategic direction, including mission and vision statements for instructional services, creating a web presence for these services, and working toward greater acceptance of information literacy on campus. The IS librarian was encouraged to continue working on developing activities that involved devising new ideas for student engagement, assessing student learning in class sessions, using new technology to enhance instruction sessions, and continuing to work with the framework.

Discussion

Following the survey, results were shared with the director of the Reinert Center. The IS librarian and the director discussed specific ideas and brainstormed further opportunities for collaboration. The IS librarian then created an executive summary, shared with the librarians at an instruction meeting.

The goals for the following projects and activities were to generate discussion; give librarians a variety of options in terms of format and content; and introduce ideas and concepts related to new teaching techniques, student engagement, assessment, and dealing with burnout. Ultimately, the main goal was to encourage the growth of the iCOP. It is important that the librarians learn to lean on their colleagues and work together on their instruction. The first major component to emerge out of this assessment was the Information Literacy Instruction Toolbox,[1] which is a collection of resources designed to assist

librarians in their planning, teaching, assessment, and collaboration.

As a result of these assessments, 13 instruction-related presentations, workshops, and discussion sessions have been carried out via the iCOP thus far:

- Two presentations and a workshop on the ACRL Framework
- An instruction sandbox on collaborative tools for the classroom
- An informal discussion session
- A journal club discussion session on Social Justice and Information Literacy related to the university's mission
- Two wrap-up discussion sessions (fall 2015 and spring 2016)
- Two "Revisiting the Framework" sessions (instructional design using backwards design)
- A workshop series with two sessions:
  - Strategies for Effective Lesson Planning
  - Engaging Assessment Activities
- A brown bag session to kick off fall 2016 instruction

Feedback from the RIS librarians has been frequent, enthusiastic, and positive. Anecdotally, they are pleased with the iCOP, and express that the activities have been practical and thought-provoking. The most positive feedback the IS librarian has received thus far is from librarians who say they have changed something about the way they teach, have successfully incorporated new activities into their instruction, or have found a new way to assess student learning.

Conclusion

One year later, our IS librarian is right at home in her role, and is using the data she collected to make improvements in the lives of teaching librarians at SLU. By using a mixed methods approach gathering quantitative, qualitative, and anecdotal information, the needs of the RIS librarians became illuminated. The IS librarian was able to use assessment to devise creative solutions to the issues librarians face in their teaching, and to operate in such a way that was compassionate, inclusive, and collegial. The idea of "teaching the whole person" is at the core of SLU's Jesuit Mission, and was the inspiration for these assessments and creating the iCOP. The hope is to be able to teach the "whole librarian." Instruction is perhaps the most vulnerable part of a librarian's work. Assessing the needs and desires of colleagues can open up a dialogue and create a truly welcoming environment for creativity, collaboration, and collegiality.

Endnote

1. Information Literacy Instruction Toolbox, http://libguides.slu.edu/toolbox.

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Appendix

Instruction Coordinator Survey

Q1: How do you feel about your instruction sessions? Choose all that apply.

- ☐ Very Satisfied
- ☐ Somewhat satisfied
- ☐ Neutral
- ☐ Somewhat dissatisfied
- ☐ Very Dissatisfied

Q2: Please elaborate if you wish to say more.

Q3: How do you want to feel when you teach? Please elaborate.

Q4: What is currently working, or has worked will in the past, in your instruction prep, instruction sessions, and/or post instruction sessions?

Q5: What would you like to change or what new strategies and tools are you interested in trying, if anything?

Q6: What are your goals when it comes to your instruction?

Q7: What would you like to happen as a result of working with the instruction coordinator/your colleagues/the Reinert Center?

Q8: Would you like to participate in group activities or individual activities? Group activities could be informal or formal gatherings, discussions, or instruction sessions. Individual activities could be on your own or 1:1 with the instruction coordinator, 1:1 with a Reinert Center staff member, 1:1 with another instruction librarian.

- ☐ Individual
- ☐ Group Activities
- ☐ Both

Q9: Are you willing to share your instruction experiences with others?

- ☐ Yes
- ☐ Maybe
- ☐ No

Q10: Are you willing to participate in activities where you may be recorded or observed and receive constructive feedback?

- ☐ Yes
- ☐ Maybe
- ☐ No

Q11: What activities or resources do you feel you and/or your colleagues would benefit from? Choose all that apply.

- ☐ Informal Discussion
- ☐ Instruction Sandbox
- ☐ Formal Sessions, i.e., attend a Reinert Center workshop for RIS faculty
- ☐ Peer-to-Peer Presentations
- ☐ Instruction Observation (RIS group)
- ☐ Instruction Observation (Reinert Center)
- ☐ Beginning of the semester kick off sessions/End of the semester wrap up sessions
- ☐ Monthly meetings
- ☐ Demonstrations, i.e., technology
- ☐ Instruction toolkit, i.e., in LibGuide format
- ☐ Instruction Newsletter
- ☐ Instruction boot camp
- ☐ Online professional development
- ☐ Other _____

Q12: What content would you like to discuss? Choose all that apply.

- ☐ Pedagogy/Andragogy, i.e., High Impact Practices, Critical Pedagogy, Problem-Based Learning, etc.
- ☐ Information Literacy Concepts, i.e., ACRL Framework
- ☐ Learning Theories
- ☐ Universal Design for Learning, i.e., designing culturally responsive sessions, sessions for students with disabilities
- ☐ Lesson Planning
- ☐ Writing Learning Outcomes
- ☐ Curriculum Mapping
- ☐ Assessing student learning
- ☐ Learning from assessment data
- ☐ Communicating value of instruction to library stakeholders, i.e., faculty members
- ☐ Educational Technology
- ☐ Assignment design
- ☐ Strategies for online instruction
- ☐ Other _____

Q13: What else would you like me to know? Please tell me any other thoughts, feelings, or suggestions.

How Well Do We Collaborate? Using Social Network Analysis (SNA) to Evaluate Engagement in Assessment Program

Nisa Bakkalbasi
Columbia University in the City of New York, USA

Introduction

In the past decade, the interest in library assessment and evaluation has expanded greatly, in particular to provide evidence and context for operational and strategic planning, priority setting, and decision making. In order to evaluate the quality and effectiveness of library services, collections, and facilities, the number of assessment activities has grown rapidly. Previously, the occasional assessment task was assigned as "other duties" to a library staff member who had an interest in it or a specific area of expertise. However, the demand for assessment and evaluation expertise has led to full-time positions, and sometimes evaluation units, charged with sole responsibility to provide leadership, coordination, and support to carry out assessment activities geared toward data-informed decision making. As the field of library assessment and evaluation has advanced considerably during the past three decades, libraries made great strides in organizing assessment activities and establishing sustainable assessment programs that fit into their organizational structures.[1]

As organizations go through the process of establishing a structure for the assessment function, questions arise whether the program should be centralized or decentralized, whether assessment librarians should be attached to functional units or central administration, and so on. In seeking responses to these questions, there is no one-size-fits-all approach, as an optimal program model will vary depending on the size and structure of the organization. From the beginning, it is important to clearly articulate the purpose of the assessment program and outline relevant roles, skills, and capabilities that should be in place for a successful program implementation, which enables continuous improvement of the organization.

At Columbia University Libraries, we developed a collaborative model, where a single full-time librarian provides centralized leadership, coordination, and guidance on assessment activities. The assessment coordinator works with division-based or organization-wide teams to carry out assessment activities, breaking functional silos and improving decision making. This approach is based on the premise that staff engagement in assessment is vital to the success of an organization-wide assessment program.[2] Columbia University Libraries is a large and highly decentralized organization. Therefore, the success of its assessment program depends on joint ventures, collaborative relationships, and alliances.

A critical but often invisible area of our organization, where we have done little to evaluate, is the formal and informal collaborative network of the assessment program. Informal relationships among employees are often far more reflective of the way work happens in an organization than relationships established by position within the formal structure.[3] Informal relationships—meaning those captured by formal organizational reporting structures like managerial relationships—can help us understand how the program functions and unveil areas where key intraorganizational connections are being made and maintained. The purpose of this research project is to establish applications of social network analysis (SNA) as a diagnostic tool to:

- Investigate the extent of engagement in the assessment program
- Retain and recruit assessment partners for continued success of the program
- Promote effective collaborations on assessment projects

Background and Review of Literature

SNA is the analysis of individuals and their relationships. The context for the social network can be personal or professional, and the relationships that individuals have with one another can be hierarchical, peer-to-peer, or some mixture of

both. The key concepts for SNA are the definition of individuals (typically called "nodes") and relationships (among those nodes typically called "edges"). As noted, different types of SNA may consider different types of relationships for measurement. By varying the choice of nodes and relationships to study, the researcher can vary the type of social interaction under consideration. As the focus of this study is collaborative connections of Columbia University Libraries' professional staff with the assessment program, the literature review focuses on studies about collaboration networks.

Previous work using SNA in the context of collaborative networks has revealed some of the benefits that this particular social science research technique can provide. Overall, the major findings that emerge from the application of SNA to organizations fall into two camps: (1) descriptive information about the existing relationships among individuals and clusters, and (2) suggested strategies for enhancing or modifying network structures in line with organizational goals.

Hoppe and Reinelt[4] provide a good overview of the basic methodological principles underlying SNA. They highlight the important qualities of social networks that reveal information about the nodes and relationships under study, and they claim that connectivity, clustering, centrality, and density are major dimensions that characterize social networks. The combination of these dimensions and the variation this produces provide leverage for comparing the results of different network structures on network operations. In their review of leadership networks, they claim that peer networks can benefit organizations by leveraging the comparative advantages of different individuals as ways of expanding the range of skills for individuals. Peer networks contain both bonding—close relationships among clusters—and bridging—relationships that link clusters, and this mixture in the types of connectivity achieved enable peer networks to provide a more general level of support than networks with comparatively fewer mixed connections. Overall, these authors provide evidence that SNA provides insights into organizational behavior that would be missed with other types of behavioral study, though they do also caution that this type of analysis requires sensitivity in data collection.

Looking at a direct application of SNA to organizational efficiency, a review of a comparative study of social networks focused on the role that SNA plays in revealing informal connections was also conducted. Cross, et al.[5] have shown through their analysis of collaborative networks in corporate settings that SNA can reveal hidden patterns of collaboration that provide insights into how individuals interact and engage with colleagues across an organization. The authors assert that once "critical junctures"—the connections that bridge clusters and cross network boundaries—are identified, steps can be taken to strengthen these junctures and improve the resiliency of the network. SNA can also help to identify key clusters where collaboration is essential to organizational success, creating opportunities to increase the support of these clusters and deepen the collaborative connections. Cross, et al. show the effect that interventions to support critical junctures had through the use of a case study, transforming a tenuous connection among two key groups into a well-integrated cluster.

Methodology

At the outset, it was decided to employ SNA as the method by which to investigate the organizational engagement in the Columbia University Libraries assessment program. SNA was selected because of its utility in mapping relations between and among individuals, allowing for collection and use of graph data. Graph data consists of two main elements: nodes, which represent individual units, and edges, which represent the connections between those units. For the purpose of this project, the nodes are the professional staff and the edges are their collaborative connections.

In order to build the dataset, existing sources of information were used rather than gathering new data through a survey. For this analysis, data were scraped from the published internal reports of the assessment program for the previous four years (2012–2015)—these internal reports detail the results of various assessment projects across the libraries. Drawing upon the listed coauthors and project participants, a dataset that consisted of the individuals involved in assessment activities was constructed. The relationships between and among participants were drawn from their relationships on the assessment projects as reported. Individuals who worked on the same project were considered to have a shared collaborative connection. In addition,

Columbia University Libraries human resources provided a list of all professional staff members and their respective divisions.

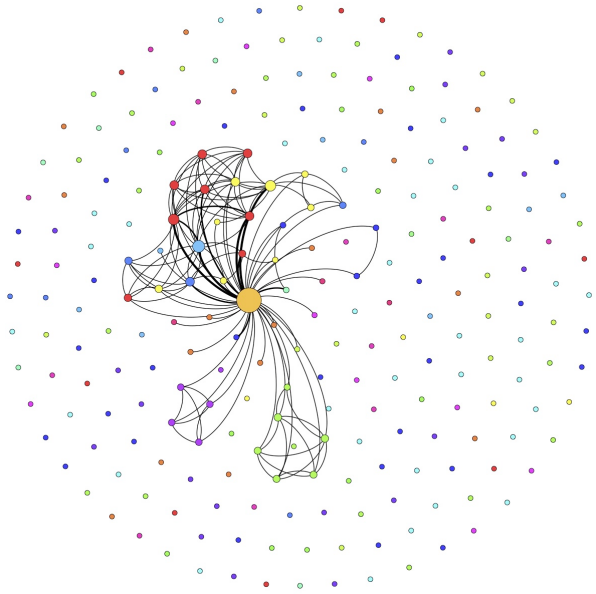
To explore different aspects of the network, various attributes about the individuals (nodes) and collaborative connections (edges) were extracted from these data sources:

1. Division affiliation of professional staff members
2. Project type
   i. Organizational projects—which are assessment projects in alignment with achieving high-level strategic goals (e.g., large scale survey such as LibQUAL+®)
   ii. Divisional projects—which are assessment projects in alignment with operational or strategic goals of a particular division (e.g., wayfinding study at the Burke Library)
   iii. Consultation sessions—which are meetings to provide assistance with micro-assessment projects (e.g., data analysis or survey design)
   iv. Administrative projects—which are ad-hoc administrative requests as needed
3. Type of collaboration—whether the collaboration was formal (i.e., assigned by managers) or informal (i.e., grassroots activities)

An open web application called Gephi[6] was used to process, analyze, and visualize the network diagram and calculate network metrics.

Findings

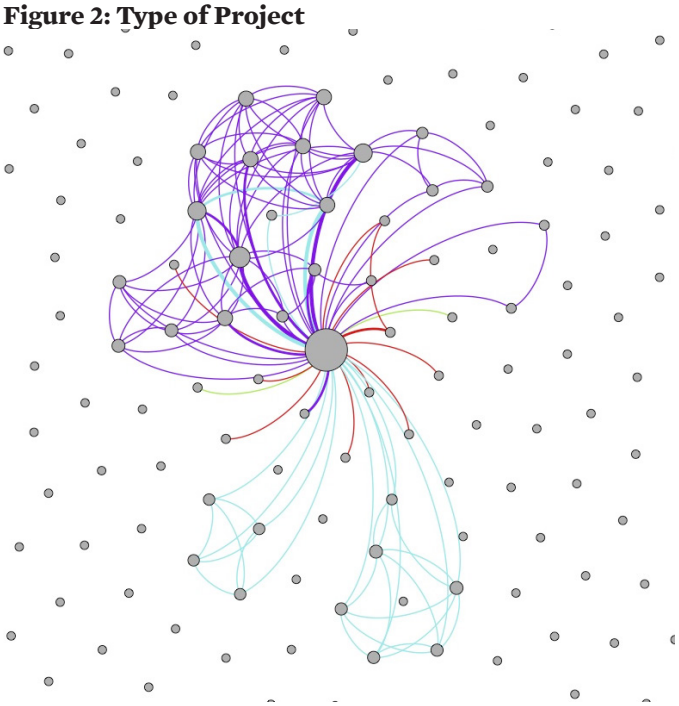
Figure 1: Organizational Network Diagram—All Nodes



This social network diagram is organized by degree centrality. The size of the node indicates degree centrality, with larger nodes having a higher degree centrality. The colors of the node indicate the division of the staff members within the Columbia University Libraries. The thicknesses of the edges indicate weight of relationships.

Of the 237 nodes, 43 nodes are connected, indicating that 18% (43) of the professional staff engaged in at least one assessment activity. The results show that professional staff members from all three main branches within Columbia University Libraries are engaged in the assessment program: Collections and Services, Bibliographic Services and Collection Development, and Digital Programs and Technology Services. A division-level review of the shows that the assessment program collaborates with a diverse set of divisions including the Social Sciences Library, History and Humanities Library, Access Services, Rare Book and Manuscript Library, Burke Library, Global Studies, Collection Development, Library Information Technology Office, and Libraries Digital Programs.

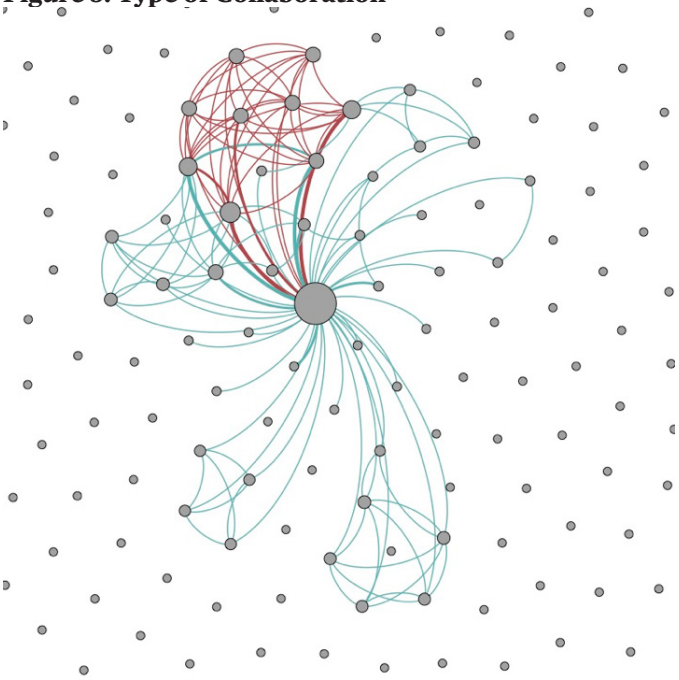
Figure 2: Type of Project



This social network diagram shows data about the types of projects undertaken by the professional staff. The colors of the edges indicate the type of projects—purple representing organizational projects, aqua representing divisional projects, red representing consultation sessions, and green representing administrative projects. The thickness of the edges indicates weight.

There are a total number of 129 collaborative connections recorded. Of these, 64% (83) involved organizational projects, 26% (33) involved divisional projects, 8% (10) involved consultation sessions, and 2% (3) involved administrative projects.

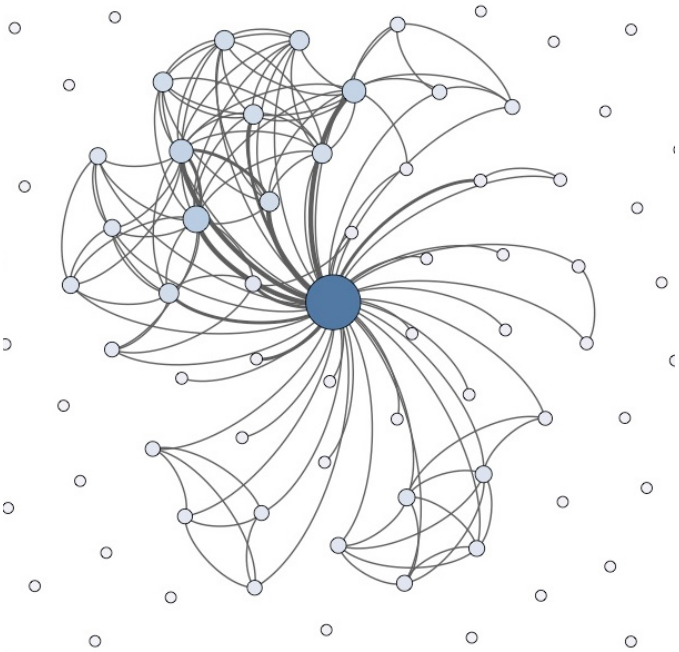
Figure 3: Type of Collaboration



This social network diagram shows data about the types of collaborations undertaken by the professional staff. The colors of the edges indicate the type of collaborations—red representing informal collaborations and aqua representing formal collaborations.

The graph data shows 67% of collaborative connections represented work that occurred through informal networks of relationships and 33% of collaborative connections represented work that occurred through formal reporting structures.

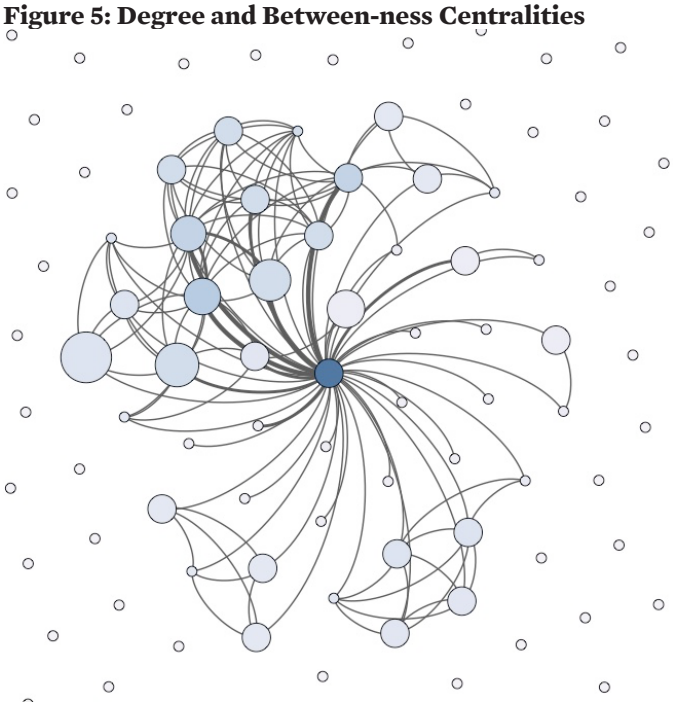
Figure 4: Degree Centrality



This social network diagram shows the data organized by degree centrality. The color and size of the nodes both designate the degree centrality—darker colors and larger nodes mean the node has a higher degree centrality.

Degree centrality is a measure of the number of connections (i.e., edges) each individual node has. The more connections that a node has, the higher degree centrality it has. Predictably, the Assessment Coordinator has the most direct connections in the network.

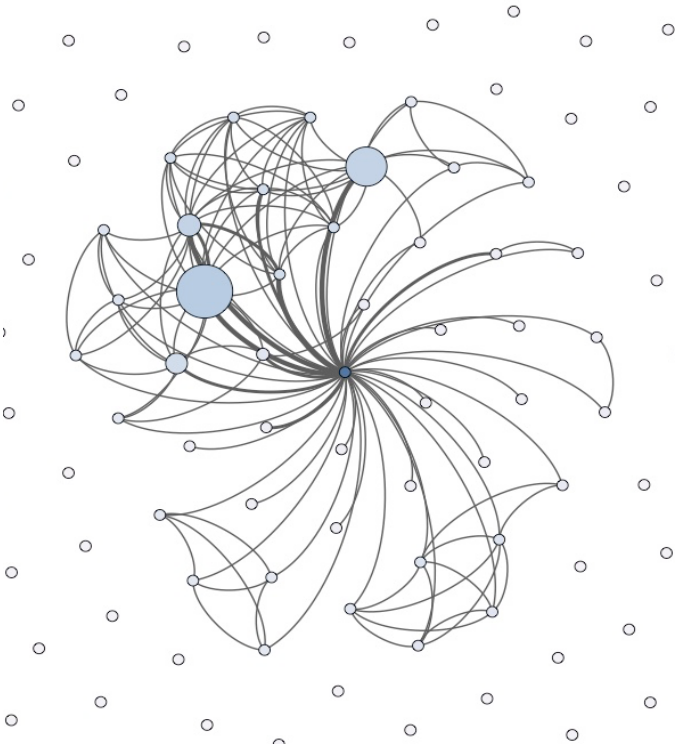
Figure 5: Degree and Between-ness Centralities



This social network diagram shows the data organized by both degree and between-ness centralities. The color of the node represents the degree centrality, with darker colors indicating higher degree centrality. The size of the node represents between-ness centrality, with larger nodes having higher between-ness centralities.

Between-ness centrality is a measure of how each node operates as a bridge to other nodes. A node with high between-ness centrality has great influence over what flows in the network and may control the outcomes of the projects.

Figure 6: Degree and Closeness Centralities



This social network diagram shows the data organized by both degree and closeness centralities. The color of the node represents the degree centrality, with darker colors indicating high degree centrality. The size of the node represents closeness centrality, with larger nodes having higher closeness centralities.

Closeness centrality is a measure of how connected each node is to other nodes. Closeness centrality captures information about how far the distance is between a given node and the other nodes in the social network. Nodes with high closeness centrality have the best visibility into what is happening in the network.

Practical Implications

At the most elementary level, the visual representation of collaborative connections with the assessment program added to our understanding of organization-wide engagement in assessment activities and created opportunities to improve our collaborative model. Overall, engagement in the assessment program was not as broad as we expected. The network diagram revealed that, over a four-year period, many of the same individuals have participated in multiple assessment projects. While having the same individuals participate in multiple projects may have advantages, it could prove a significant weakness for the assessment program if the same few individuals inadvertently discourage new people from participating. In addition, as the demand for assessment increases, it is critical to provide professional development opportunities and increase expertise in library assessment across the organization.

In conclusion, the graph data provided useful insights in finding the right balance between retaining existing partners and recruiting new partners in future assessment projects. For example, finding out about individuals that are highly central in the collaboration network helped identify key individuals who could serve as bridges among project teams and should be retained. Alternatively, understanding who is peripheral in the collaboration network helped find ways to engage these people to ensure that relevant expertise is developed in different of the organization.

Endnotes

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Acknowledging the Political, Economic, and Values-Based Motivators of Assessment Work: An Analysis of Publications on Academic Library Assessment

Lise Doucette
University of Western Ontario, Canada

Abstract

Key motivators for assessment work in academic libraries include the persistent service ethic and evolving user focus in libraries; a quality assurance framework in higher education that focuses on measuring outcomes; and an overall political and economic climate of accountability and austerity. However, researchers publishing and presenting about library assessment do not always explicitly acknowledge the factors influencing their assessment work, nor do they consistently identify whose values the assessment represents. Through a review and content analysis of the papers published as part of the biennial Library Assessment Conference proceedings from 2006–2014, this research identifies how researchers acknowledge the motivators of assessment work, and aims to promote awareness and reflection among researchers about their own motivations.

The paper highlights results related to frequency and nature of language used by researchers to show their motivation for conducting library assessment work, with 92% of authors identifying the motivator of improving the library and 46% identifying the motivator of proving something about the library. The use of the concepts of accountability and hope are further discussed. Recommendations are included for librarians to consider before and while undertaking assessment work and when preparing manuscripts and presentations about assessment.

Introduction and Purpose

Assessment work has grown substantially in academic libraries in the last two decades, as have physical and online venues for disseminating assessment research and sharing projects. Commonly used definitions of assessment focus on two facets: *proving* something about the library (e.g., demonstrating contribution to learning or need for funding), and *improving* the library (e.g., improving services, spaces, or collections). Assessment has been increasingly presented and discussed as compulsory in libraries—an activity that all librarians must engage in if they in fact value libraries and embody library values. Nitecki, Wiggins, and Turner write that the idea of a culture of assessment "has become a popular 'necessity' for academic libraries since the 1990s,"[1] and the authors' use of scare quotes in that quotation demonstrates some of their skepticism about its role. The development of library assessment has introduced new terminology and concepts, not always well-defined, and librarians use words such as "value" (as in, proving the value or contribution of the library to its users or its broader institution) without explaining what they mean by it.[2] While there is certainly tacit knowledge within the field, alongside that are many assumptions about practices, meanings, and motivations.

This paper seeks to determine whether motivators for assessment (i.e., the reasons why assessment work is being done) are being acknowledged by librarians and whether a variety of motivators are being named. Is there, in fact, variation in how librarians describe their reason and motivation for engaging in assessment work?

There is a lack of critical reflection and research about motivations for engaging in assessment work; through content analysis of papers published in the LAC proceedings, the purpose of this paper is to provide a baseline for understanding how librarians describe their motivations for assessment work, and to provide perspectives on the importance of presenting and understanding these factors. Content analysis allows for an unobtrusive review of authors' disseminated work.

Literature Review

While much has been published about library assessment, very little has focused critically on motivations or rationale for undertaking library

assessment work. Motivations for assessment have been noted broadly by a number of authors as background to their own work and have included improving quality of services, calls for accountability, supporting the institutional mission and vision, questions prompted by stakeholders, and internal management needs. The notion of defining motivation for assessment is addressed indirectly by Snead, who writes that "library decision makers need [to] be able to select the best evaluation strategy given the... [m]otivation for the evaluation," which suggests that one must be able to identify the motivation for the evaluation or assessment.[3] Assessment can be motivated by deeply held values, with the National Survey on Student Engagement (NSSE) survey as an example: "Constructing an educational metric is never a neutral act. Value-based choices about what to measure, how to measure it, and how to draw conclusions and communicate results within the constraints set by methodological integrity, will dog every step."[4] Identifying and acknowledging those values and motivations is key to bringing clarity to assessment practices.

Two sets of authors have conducted surveys or interviews related to rationale and motivation for assessment. Town presented results from 38 responses from libraries at British institutions and found that "[r]ationales for undertaking value and impact measurement were almost numerically evenly spread across the three motivations of advocacy, service improvement, or inter-institutional comparison,"[5] with many libraries providing more than one motivation. Hiller and Wright visited 24 libraries as part of two Association of Research Libraries (ARL) related services: "Making Library Assessment Work" and "Effective Sustainable and Practical Assessment." They found that "the primary motivators for engaging in assessment were the external ones of accountability and accreditation, and the internal ones of measuring achievement and improving library resources and services."[6] More specifically, from highest percentage to lowest, the responses were: using data effectively, organizational culture/culture of assessment, data analysis, university needs, data collection, staff assessment expertise, accreditation, performance measures/benchmarking, planning (library), and student learning outcomes (instruction). Hiller and Wright also present results from a 2007 survey undertaken by ARL of 73 libraries about the impetus for assessment (again from highest to lowest percentage): desire to know more about your customers, investigation of possible new library services/resources, desire to know more about your processes, desire to identify library performance objectives, need to reallocate library resources, accountability requirements from parent institution, and institutional or programmatic accreditation process.[7]

Some papers have acknowledged the possible tension between individual or library motivations and values and the institution or government's motivations and values, in particular as it relates to adopting business practices. In the forward of Oakleaf's *Value of Academic Libraries* report for ACRL,[8] the ACRL executive director and the ACRL president acknowledged the difficulty for libraries, librarians, and academics in adopting business terminology and practices, and note that this is a necessity because of our environment; Oakleaf herself also acknowledged this tension.[9] Others note that "standard economic methods for determining value are not appropriate"[10] for universities or libraries, and call return on investment calculations "naïve and misinterpreted assessments of our roles and impacts at our institutions and across higher education."[11] The use of management tools (e.g., balanced scorecard, strategic plans, LibQUAL+) are tied to discourse around accountability and evaluation, and tools that conform to the values of an organization are promoted.[12]

How do values (beliefs and codes of behaviour that guide actions and decisions) relate to assessment? Some librarians argue that the mission, vision, and values of a university must inform library planning and assessment,[13] but do not address how values of the library or librarianship fit into that process, and what happens if (when) there is disagreement. As an extreme example, a director of a research library in South Africa shared some of the history of the apartheid government requiring libraries to report numbers of volumes in specific subject areas, in order to impose control over the types of materials that citizens or students could access.[14] Are we critically analyzing and questioning the rationale of our own governments' or institutions' demands for assessment, and the implications on our own libraries, staff, and users? Do assessment practices of librarians always mirror and incorporate core values of librarianship, such as those of the American Library Association (access, diversity, and social responsibility, among others)?[15] Oakleaf poses a question about the congruence of espoused values and enacted values,[16] and Town and Kyrillidou note that "[v]alue is inextricably linked to values; thus

values will provide the key and route to proof of worth."[17] Tying values to actions is not new, and yet the connection is not always made explicit.

Methodology

While there are many sources of published literature about library assessment, the Library Assessment Conference (LAC) is a key venue for presenting assessment work, with proceedings published about one year after the conference. The 2016 conference marked the 10-year anniversary of LAC, and papers from the five sets of LAC proceedings from 2006–2014 (a total of 361 papers from which a random selection was generated) were chosen as the units of analysis for this content analysis.

The goal of the analysis was to identify motivations for library assessment and to code the text using a name that represented the type of motivation, whether for a specific assessment/research project or for library assessment generally.

While Town[18] and Hiller and Wright[19] present results of three surveys that identify possible motivators of assessment, this research uses an inductive approach to identifying motivators so as to not predetermine what a motivator might be. A structured process for developing codes through content analysis was used by randomly choosing 10 papers out of the 361 and carefully reading them to identify and develop coding language for assessment motivators.

When reading for text that described motivations, the author looked for words such as *purpose*, *reason*, *because*, *why*, *goal*, *objective*, and *intention*. Subjective reading and interpretation was done to best identify the motivation(s) for the assessment work. Imperatives or statements such as "Libraries must demonstrate..." or "This study attempts to determine..." or "We wanted to better understand this area in order to..." also indicated motivations or justifications for conducting that work. Most papers contained more than one type of motivation, and often contained more than one instance of describing a particular motivation.

This iterative process led to a list of 17 possible codes for motivations. Definitions were created during the process based on the coded texts, and verified to accurately and adequately represent the codes and the coded text. The codes were further reviewed and revised along with the coded text to determine an appropriate level of coding. Five codes were removed and the texts were assigned other codes as applicable. While there are similarities among the codes, in practice it was straightforward to differentiate among the codes, and the goal was not to assign only one code to each paper, but rather to identify all of the possible motivators in a given paper.

For this research, the author then randomly selected 10% of the number of papers each year, rounded up to the nearest whole number (see Table 1).

Table 1: Total and Analyzed Papers from LAC Proceedings, 2006–2014

Conference Year	Total Papers Published in Proceedings	Papers Analyzed
2006	43	5
2008	66	7
2010	68	7
2012	72	8
2014	112	12
Total	**361**	**39**

The author then closely read the 39 papers (see Appendix A for the list of papers) and assigned the predefined codes to phrases or text within each paper that demonstrated motivation. One new motivation was identified that did not match a previously defined code, and a new code and definition was created. There were 13 total codes after completing the content analysis. Table 2 shows the final groups of codes found to be motivations for library assessment, with brief definitions.

Table 2: Motivators for Library Assessment

Code for Motivator	Brief Definition
Develop Internal Expertise	Providing hands-on experience for librarians and staff to develop knowledge and interest in assessment
Contribute to Body of Research	Contributing to library literature so as to provide information/evidence for others; filling gaps in knowledge
Involve Users	Demonstrating user-centeredness of library by focusing on users; involving users directly in assessment for engagement purposes
Determine User Satisfaction	Measuring/determining users' perceptions and satisfaction with library
Measure Contribution of Library	Determining how the library or a service of the library has contributed to users (goal is measuring versus proving)
Make Decisions (Current and Future)	Using data gathered as part of assessment to make a decision about a library service/resource (focus is on evidence versus anecdotes, making best use of library financial and human resources)
Improve the Library (Services/Resources/Spaces)	Making an improvement to the library or a library role (e.g., student learning, spaces, services, collections); focus is on making something better for the users
Understand Users' Behaviours/Needs/Knowledge	Developing greater understanding of users' knowledge, behaviours, and wants/needs; a further goal may or may not be present (i.e., why do the authors want to understand users?)
Advocacy and Justification	Providing information to help advocate for or justify funds/investment/expenditure, future projects/renovations, librarian/staff time
Demand from Administration	Responding to demand from the university or library administration for assessment
Political/Economic Situation	Responding to local or broad political or economic factors
Accountability	Responding specifically to a demand for accountability; any use of the word stem accountab* in reference to libraries or institutions.
Prove/Demonstrate Value of Library	Proving that the library makes positive contributions (e.g., to student learning, to faculty research); combination of proving/demonstrating/showing + value/worth/impact/outcomes of the library (goal is proving versus measuring)

The initial expectation and goal of the research was to identify political, economic, and values-based motivations. Upon examining the papers, these were not in fact prevalent motivations, or were not expressed at a superficial or manifest level. For that reason, the broad code of "Political/Economic Situation" could be used.

Findings

As noted in the introduction, assessment is often defined as having two facets: *proving* and *improving*. The codes can be similarly divided into motivations that aim to prove something about the library, and motivations that aim to improve something in the library. Table 3 summarizes the motivations

found within the 39 papers. All papers had at least one reference to a motivation, and 32 had more than one motivation. Authors who developed and wrote out their research questions (generally in the introduction to the paper) had more clearly structured motivations.

One-third of the papers included motivators from both the *improve* and *prove* categories, reinforcing that the two categories are not mutually exclusive and that assessment work can serve multiple purposes. In many cases, assessment that could be used for immediate action or improvement could also be used to help prove something about the value of the library.

Due to the small sample size, no meaningful comparison can be made among the different conference years.

Table 3: Numbers of Papers with Motivators

Motivator	Number of Papers		
Develop Internal Expertise	2	Improve: 36 papers (92%)	Both: 13 papers (33%)
Contribute to Body of Research	4		
Involve Users	6		
Determine User Satisfaction	6		
Measure Contribution of Library	13		
Make Decisions (Current and Future)	15		
Improve the Library (Services/Resources/Spaces)	23		
Understand Users' Behaviours/Needs/Knowledge	24		
Advocacy and Justification	3	Prove: 18 papers (46%)	
Demand from Administration	4		
Political/Economic Situation	5		
Accountability	7		
Prove/Demonstrate Value of Library	9		

Improving the Library

The vast majority of papers (92%) included at least one motivator of *improving* the library. Papers with motivators in these categories often focused on a specific project as opposed to assessment writ large. The focus was frequently directly tied to users, and reflected the desire to change something in the present or near future. In many cases, authors who described *improving* kinds of motivations presented their assessment work as valuable in and of itself, and understanding users' behaviours and needs and measuring how the library contributes to users' learning and research experiences were labelled as beneficial. Even for those 23 papers with the motivation to "Improve the Library (Services/Resources/Space)," the specific improvement or plan for improvement was not always made explicit. There is often a disconnect between the motivator of the assessment and the result of the assessment.

The choice of language around the desired or observed utility of the results of the assessment work was often unclear and referenced ideas of hope and the future. Results of assessment work may not be straightforward, and implementing changes is not always within the scope of the papers' authors or within the authors' timeframe with respect to the conference presentation or publishing of the conference proceedings. However, more clearly defining the motivation and research questions or project goals at the start of the project and paper would allow authors to more directly determine if they have answered their questions or met those goals.

Proving the Library

Just under half (46%) of the papers discussed a demand to *prove* or demonstrate something about the library as a motivator for conducting assessment, whether it be a specific project or research or assessment generally. In these papers, assessment and the motivation for assessment are described at a high level, and are often presented in a strategic (as opposed to operational or immediately practical) way. While the ultimate beneficiary of the assessment may be the direct user (student

or researcher), the motivations in this category generally referred to demand from higher-level stakeholders. This demand is coming from university administration, who are themselves being pressured and required by governments and accrediting bodies to demonstrate learning and research outcomes. It is described in a matter-of-fact way, as something that has already been accepted and with which libraries must comply without question. There was no written reflection on the possibility of libraries playing a role in having conversations about or shaping that demand. The "demand" is also often described in vague terms, and without further discussions with the authors, it would be impossible to truly understand the context.

"Accountability" was described as an era and a movement, and was used in ways to suggest that the definition should be known to all readers. Similarly, economic pressures, fiscal realities, and political climate are also noted as motivations for conducting assessment in the library, but are not described in detail. The assumption is that readers (in particular American readers) will understand the situation experienced by the authors and their institutions.

Implications

This research demonstrates that authors do identify at least one motivator for their assessment-related projects and work; however, motivators are not always clearly identified. It often took careful reading to find the motivator, and many were identified by interpreting fairly general statements and piecing together different statements within the papers. Making the motivators explicit will help readers more fully understand the context and the impetus for the assessment work. Furthermore, acknowledging additional context around the values and organizational culture that informed the assessment work will inform readers and facilitate conversations around the direction of assessment, as well as conversations about librarians' roles in shaping that direction. Values such as access to information or social responsibility may be so innate as to seem obvious, but clearly identifying them will enhance a rich body of literature and provide context for readers and colleagues.

Before embarking on a project, it is recommended that the authors clearly discuss and define the motivation behind their work, and revisit this during the project. The "why" of assessment must be discussed purposefully and critically, and authors should be clear about their interpretations and the context for potentially vague concepts such as accountability or value. This additional information and thoughtfulness may also surface assumptions to be explored and possibilities for advocacy around libraries' and librarians' roles in determining the future of library assessment.

Notes

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Appendix A: LAC Proceedings Papers Used as Units of Analysis

Susan Gardner Archambault, "Charting Your Course: Using Curriculum Mapping to Enhance Information Literacy," in *Proceedings of the 2014 Library Assessment Conference: Building Effective, Sustainable, Practical Assessment*, August 4–6, Seattle, Washington (Washington, DC: Association of Research Libraries, 2015): 260–264, http://libraryassessment.org/bm~doc/proceedings-lac-2014.pdf.

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Assessment as User Engagement: Using User Testing and Assessment to Build Investment in the Library's Intranet

Elizabeth Edwards
University of Chicago, USA

Abstract

In 2012, the University of Chicago Library charged a group with the task of developing an understanding of staff communication needs with an eye to improving the library's intranet. A series of interviews resulted in the development of specifications for a new intranet while also highlighting a number of organizational and technological challenges. Applying user experience methods to exploring these challenges resulted in better information for site development while also engaging staff from across the library in the improvement of the intranet.

The Problem

In 2012, the University of Chicago Library charged a group with the task of defining and describing the current uses of the library's intranet, Staffweb, so that the site could be improved to better meet its central functions: disseminating information from university and library human resources, as well as about the library itself, to library employees. At the time, the site was perceived as meeting these needs; however, it was also widely perceived as stale or out of date, a perception reinforced by a homepage that saw infrequent updates.

In order to define and describe uses and requirements for the intranet, a series of interviews were conducted with library staff from units that made heavy use of the intranet, or who were otherwise understood to be major stakeholders for the site. While developing the script for these interviews, it became clear that, while it was important to understand how the intranet was being used within the library, it was also crucial to explore the challenges that resulted in patterns of non-use.

Three major themes emerged from the analysis of interviews conducted with about 20% of library staff over a period of two months: issues of content, technology, and culture. The issues contained within these themes were often closely related; for example, content may have become stale because staff were unable to update it using the content management system that was widely perceived as difficult and cumbersome. Regularly encountering stale content resulted in lack of trust in the currency of the site, which made it easier over time for staff to ignore or forget about the intranet.

These themes and interconnected issues created two significant challenges: how can the library develop requirements for improving the intranet when users do not currently find the site useful? And, how can the library facilitate user engagement with the intranet throughout this process in order to ensure that a new site is successful? It was clear that in order for a new intranet to be both useful and used, a deep understanding of the needs, perceptions, and experiences of its potential users must be central to the design process.

User Experience

According to SPEC Kit 322: Library User Experience, user experience in libraries "is interpreted to include a wide range of activities... including but not limited to assessment, user engagement, library design, outreach, and marketing."[1] User Experience, or UX, draws its theoretical framework from the fields of human factors and ergonomics, and often applies social science methods to exploring and improving the interaction between individuals and systems, interfaces, or things. UX methods include task-based testing, focus groups, interviews, card sorting, and participatory design.[2] In web and systems development, these methods are often applied to measure the ease of use of a specific system or interface; however, they can also be used to explore the usability of spaces and services in the real world. User testing is a critical component of any design process, and should be conducted frequently throughout the design cycle.

The University of Chicago Library convened its User Experience Group in 2012 in order to "conduct usability testing or other research to support user-centered design practices in support of the Library's web presence."[3] The UX Group was comprised of individuals from across the library who had interest in or experience with user testing, and was cochaired by the library's assessment librarian and web program director. The work of this group specifically focused on the library's web presence and other digital interfaces; this work complemented projects conducted by the Assessment Project Team, which had previously held responsibility for user testing.

Applying User Experience Methods

Over a three year period, library staff members applied a range of user experience methods to exploring the issues identified in the initial interviews. The use of these methods provided opportunities for staff from across the library to share their experiences of the intranet; for many, this was likely the first time they had been asked their opinion about the usability or, in fact, the utility of a site that was supposed to be essential to their daily work.

Method: Interviews

While the stakeholder interviews were intended to generate requirements for improving the intranet, they also served as the first phase of user engagement. Staff were pleased to be asked about their experience with and opinions of the site, and the focused conversations about the intranet and its role resulted in more conversations across the library.

Engagement Outcome: Governance Group

The findings and recommendations from the interview project were reported to library administration, with one of the most crucial outcomes being the creation of a governance group charged with addressing many of the issues detailed in the report. This governance group was recruited from units that had a large amount of content on the intranet, or whose staff were understood to be heavy users of the intranet. As a result, the group was comprised of both librarians and staff, with representation from service units that are often excluded from such groups. Crucially, this diversity of membership ensured that the specifications and priorities of the site reflected the needs of the entire library, not just those with the most power in the organization. This was particularly important given that lack of consistent representation had been identified as a significant organizational issue with the previous intranet.

Method: Heuristic Analysis

Having established the problems by talking to users and identifying solutions based on an understanding of technology and institutional culture, work on the intranet shifted to the library's UX Group. All members of the group were users of the site; however, most were relatively new to the library and had had no involvement in the creation of the site.

In order to identify next steps for the redevelopment of the intranet, members of the UX Group conducted a heuristic analysis of the top-level pages. Over time, these pages had turned into lists of shortcuts to content on the rest of the site, presenting links to content that was expected to be of use to a large portion of the library. A closer review of these pages revealed many redundancies within and between pages, with many links appearing multiple times under different display text in order to ensure that site visitors could find needed content using the language that would be most clear to them.

Engagement Outcome: Reflection and Discussion

The review of these pages was conducted in a highly collaborative way, with members of the UX Group working together to identify problems with page content and propose solutions for either improving the existing site or developing a new site altogether. Working in this way was engaging and fun, and built enthusiasm among members of the UX Group at the prospect of an improved intranet.

Method: Testing Use Cases via a Survey

In order to test the use cases described in the interviews, the UX Group developed a survey to capture information about site visitors' use of the intranet, as well as their understanding of the site's layout, navigation, and content. A pop-up survey, administered through Qualtrics, asked site visitors to indicate the purpose of their visit to the site based on common use cases identified in the interviews. Respondents were then asked to click on a screenshot to indicate where they expected to be able to complete their intended task or find the information they were seeking. Finally, respondents were asked about the frequency with which they used the intranet to complete this particular task.

The findings of this survey generally affirmed the use cases described in the original interviews; however, they also revealed that 25% of respondents visited the site by default, perhaps because it was set as their homepage, rather than to access specific content or to complete a task. This finding reinforced the importance of building engagement around the new site.

Engagement Outcome: Different Voices
Previous user testing methods had focused on site stakeholders (e.g., members of the governance group) or expert users (e.g., the UX Group), but this test engaged actual site visitors during an authentic use. Rather than asking participants to speculate about how they might use the intranet, this survey asked those currently visiting the intranet to describe how they were actually using the site. It gave site visitors an opportunity to indicate their actual use, rather than what they believed to be the intended use of the site. In this way, this test captured different data from different users, including those who might not have had the opportunity to share their experiences because they did not consider themselves to be site users.

Method: Paper Prototyping in Pairs
Once the library moved forward with the development of a new intranet, different methods of user testing were used to refine specifications and test aspects of the design. Paper prototyping was used to explore user preferences for the presentation and organization of search results, as the usability of the existing search function was so bad that site developers were essentially starting from scratch. Participants were recruited from across the library, and were then matched with a colleague with whom they did not ordinarily work. Each pair worked through a series of tasks using printouts of possible search result configurations. Discussion was encouraged, culminating with the pair collaboratively ranking the prototypes.

Engagement Outcome: Shared Discovery
This exercise was conducted several months after it had been announced that a new intranet was finally being developed, and more than three years after the initial interviews that provided the specifications for the site. Participants were recruited via a library-wide e-mail; more volunteered than were able to be involved in testing. The pair format facilitated conversations between individuals from different departments; these conversations often included reflections on similarities or differences in needs and behaviors related to the intranet. Test facilitators were pleased by the enthusiasm and engagement displayed by participants, particularly those who had used the old site for years and so had reason to be skeptical of the new site's utility.

Method: Task-Based Testing via a Scavenger Hunt
Following the launch of the new intranet in early 2016, task-based testing was conducted under the guise of a scavenger hunt. Library staff were invited to complete a series of information-seeking tasks using the new intranet. Answers and the addresses for the pages where they had been located were submitted via a web form, with correct answers resulting in entry in a drawing for several small prizes.

Engagement Outcome: Explore the Intranet
Conducting the task-based testing in this format allowed for feedback from far more participants than would have been manageable in a more traditional user testing environment; it also allowed participants to complete the tasks at their own pace and while exploring the new site. In addition to encouraging library staff to explore the intranet, the scavenger hunt also created an incentive for units to migrate their content to the new site in order to prevent site visitors from finding empty or incomplete pages where desired content should be found.

Conclusion

While user experience and usability testing are crucial to the design and development of systems and interfaces, these forms of testing can be beneficial for participants as well. While staff engagement was not the original intent of the user testing conducted by the University of Chicago Library on its intranet, the positive response from staff to each round of testing resulted in user testing being considered a core component of the communication plan for the launch of the new intranet. The theme "beautiful because you're involved" could be applied equally to the new site and content created by dedicated staff members—and to the enthusiasm and positive engagement around the site that was fostered by user testing through the design, development, and implementation process.

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Using Peers to Shed Light on Service Hours for Librarians

Hector Escobar and Heidi Gauder
University of Dayton, USA

Purpose

Public service hours for many academic librarians have changed within the last decade. As reference statistics have declined, so, too, have job descriptions changed for the typical reference librarian. The academic library community hears terms more commonly such as outreach, liaison work, embedded librarianship, consulting hours, scheduled appointments, etc., for what used to be normal service desk hours. With a changing service model comes accountability. How do institutions account for these new forms of work and duties that have replaced traditional service desk hours? How does this feed into performance or merit review?

While it may be common to hear about other service models from colleagues at other institutions, taking a deeper look into the granularity of service hours and reallocation of hours was never done from our academic peer network. We knew anecdotally that other libraries may have reduced hours, but we did not know how a service model translated to fill in hours formally worked by librarians at a traditional reference desk.

With a phased library renovation taking place over the next two years, the University of Dayton's Roesch Library wanted to explore other reference department service models. The willingness and desire to explore other models was based on steady in-person levels of support that had flattened over a two-year period. The library also wanted to see what its peer groups of institutions were doing for librarians who previously worked reference desk hours but may have changed their service models recently.

Design/Methodology/Approach

A total of 25 peer institutions was identified by the provost office institutional researcher. This list consisted of both in-state and out-of-state institutions that were similar in either student population size or demographics based on a private, faith-based institution. These institutions are common in campus discussions centering on academic programs, campus services, and faculty salaries.

With the help of an undergraduate honors student intern and a member of the library's assessment team, a process was developed to construct a survey centered on gathering more information on reference service models. Reference service model literature was given to the student intern to gain a better perspective of current service models. With supervision, the intern worked to identify the contact information for individuals identified as head of reference services or similarly titled department head positions.

Next came the survey design. The goal of the survey was to gain a better perspective on the current state of an institution's reference service model, department composition and size, reallocation of service hours previously worked by librarians, and what, if any, efforts were being identified to account for equality among public service librarians.

Following the survey design, a Google form was developed to capture responses. The survey was sent to all 25 peer institutions. Follow up e-mails and calls were sent by the intern to institutions who had not responded to the initial survey. In all, 17 institutions responded and their survey results compiled for presentation at the 2016 Library Assessment Conference.

Peer institutions who responded to the reference survey

American University	Miami University
Baylor University	Ohio University

DePaul University	Saint Louis University
Drexel University	Santa Clara University
Duquesne University	University of Cincinnati
Fordham University	University of Denver
Hofstra University	Villanova University
Lehigh University	Xavier University
Marquette University	

Findings

Our overall findings supported some initial anecdotal thoughts believed to exist at our peer institutions with their reference service operations. While reference staff and service desks varied from institution to institution, the clear majority indicated that reference librarians have reduced or will be reducing their public service hours.

In terms of a service model, responses indicated a wide variety of existing service models and staffing approaches. Of the 17 responses, six indicated a combined service desk model, five had traditional reference desks, two were consultation only, and five noted as "other."

A combined service desk was defined as a desk that provided other services in addition to traditional reference support, such as circulation or information technology support. Traditional reference desks were defined as a service desk that is primarily responsible for providing reference support. A desk that was consultation-based only was defined as an area where librarians provided assistance either behind a desk or in an area that was not viewed as a traditional service desk. The term "other" was used to capture arrangements that did not fit the other service definitions, such as office visits or perhaps satellite hours.

In terms of librarians staffing a service desk that provides reference, only four institutions indicated a librarian staffed solely. The rest indicated a mix service approach, with some institutions having librarians staffing alongside other non-librarian personnel or librarians being on-call or librarians that came out to specific areas to engage their clients. The survey analysis painted one overall clear picture. The traditional reference desk is a minority in terms of a service operation.

The next question for us was to examine what public service librarians are doing, if they are not working behind a traditional service desk or if they have seen their hours reduced over time. Overall, we saw trends that indicated a mixed amount of other activities. For example, one institution indicated that their public service librarians are now seeing increased library instruction loads, others saw more hours spent hosting chat reference, or had more hours allocated for liaison responsibilities.

These trends may have a tie into the overall decrease of in-person reference questions we continue to see in national trends. For example, if an institution sees fewer drop-in complex questions, some possible reasons could be related to the accessibility of more library resources via discovery layers or with students being exposed to more library instruction. If the goal of library instruction is to increase information literacy and to enable our students, with more instruction comes the possibility of lower in-person reference statistics.

The same reasoning goes for other modes or functionality for reference support. Another example would be librarians seeing more hours supporting instant message or chat. This may be attributed to increased chat locations. Chat windows that traditionally live on "Ask a Librarian" pages are now seeing widgets incorporated into discovery layers or other products like LibGuides or local course management systems.

Another reason or trend noticed for reduced reference desk hours was attributed to growing liaison responsibilities. While we did not drill down to the level of what those responsibilities were, the assumptions would be a mixed approach of research or reference support for academic departments. While liaison duties were noted, we believe this could be an area of greater exploration.

For example, what would be the core set of liaison duties that everyone does and is accounting for? We traditionally look at fulfilling liaison responsibilities by looking at our collection budgets and how many classes we may have taught for a department. Could there be more to benchmarking liaison duties?

The trend for reducing librarian service hours continued when we asked the question, "Have reference hours for librarians declined and are you planning to change your service approach?" From the 17 institutions that responded, only five indicated they do not plan to change their service approach. The remaining 12 indicated they will or already have made a change to the service approach for reference support from librarians. This, we believe, answers our main question whether or not reference or research departments are adapting to the needs of their local environment. To notice that this change includes 70% of our respondents is a clear indication that our peer network is working to address the needs of their users in a more effective way.

Following this section of questions, we focused on finding out what was filling the previous void of prior or future reduction reference service hours. We labeled this section of questions as reassigned time. The top five survey results indicated: 31 percent of institutions were looking at librarians hosting more library instruction sessions; 23 percent indicated librarians were attending more meetings internal to library operations; and 11 percent indicated more collection development, followed by satellite hours (11 percent), chat coverage (5 percent) and other (17 percent).

The last focus of our survey dealt with equity of reassigned time. This was by far the most diverse in terms of responses. The question that comes to mind is, if you have a librarian who hosted five or six hours a week and now only works two hours of service hours, what are they now doing with their time and how does that compare to fellow colleagues within a department or unit in the library? Another situational analogy would be if you had two librarians who liaised to an equal number of departments, but one saw higher institution loads and reference appointments because of their ability to engage faculty. How does that compare to the other librarian supporting a similar department size, but sees less instruction or reference activity?

Some open-ended responses included:

- "Working on a workload policy."
- "We have no formal way to do this. The campus plans to do a workload study for faculty."
- "There isn't an issue with equity or fairness. All developing their own customized liaison plans that takes into consideration their academic unit assignment(s) and are planned considering the unique cultures of departments or schools with which they work. They also have other areas of expertise or focus (digital scholarship, govt docs, e-learning, undergraduate learning, etc."
- "Because individual librarians are very different, and needs of the departments they liaise to are very different, and the librarian job descriptions are different, equity is not always relevant."
- "Working on an assessment of that right now but will never be equitable."

Practical Implications

We went into this survey project to help address three needs of our service environment: investigate the current state, impact on a renovation, and future planning. By surveying our peers we were able to gain a better perspective of the current environment of reference support services. Reference department sizes varied, but we were able to see those institutions that have already transitioned to reducing librarian public service hours or were planning to in the near future. This current state of change for reference departments illustrates the current needs and demands of the clients they serve.

The University of Dayton will be undergoing a phased renovation of its library. The renovation is expected to reduce its service footprint temporarily for at least one semester while this renovation takes place. Since service space will be reduced, it will allow us to explore models of service that do not necessarily rely on a service desk. For example, we could revisit institutions who operated higher appointment-based operations and see how scheduling was handled or how office hours were promoted across campus.

We are fortunate that our library culture has a general acceptance of change and that our service models vary based on demand and what our data analysis has showed. Because of this we generally make changes to our reference support model that fits both the needs of our students and the abilities of our reference librarians. We do anticipate taking bits and pieces from what we saw from our survey

results and seeing what works and what does not work for us.

The larger and future question for us, as it seems for a number of institutions we surveyed, ties back to question of equity and merit. We believe librarians, for the most part, will have to showcase their value-added services to the departments they liaise with to illustrate their impact and benefit on campus. While collections migrate to more digital and on-demand content, and libraries increase for space, librarians can no longer assume a passive role in thinking that students will always seek their assistance. This is clearly evident with reference statistics declining nationally. How do you ensure you have everyone onboard and accounting for an equal amount of work? While it is easy to measure the amount of hours worked at a desk, when those hours are decreased or removed entirely, librarians have responsibility in showing their benefit to the library.

In conclusion, institutions have either had long histories of either providing public service or limiting service hours. For institutions that have migrated away from a standard reference desk model, we hope that our survey results shed light on other factors including staff performance, service outreach effectiveness, and task distribution for librarians who are no longer responsible for hosting service hours. While each institution will vary and have different dynamics that influence supporting services, we hope the survey will highlight factors to consider for institutions considering changing to a different service model to meet new library demands.

Active Learning with Assessment

Katharine Hall and Meredith Giffin
Concordia University, Canada

Introduction and Context

Motivated by heightened demands for accountability, academic libraries are increasingly striving to incorporate assessment into their planning and decision-making processes. Employing a systematic approach to evaluating the libraries' services, processes, and practices is relatively new to Concordia University Library.

An Assessment Committee with representatives from public services, collection services, library systems, and administration was formed in June 2015. One of the initial objectives of the committee was to raise awareness of assessment within the library. It was also recognized that the knowledge and skills of both librarians and support staff relating to assessment had yet to be developed. As members of the Assessment Committee, we felt that providing learning opportunities relating to assessment for all staff would support integration of assessment into everyday practice.

At the same time, the university and the library were engaged in a comprehensive strategic directions exercise. After a series of brainstorming sessions involving all library staff in the spring of 2015, a five-year strategic plan for the library was drafted. The first objective of the plan is to "Empower library staff to develop skills and knowledge and to share expertise."[1]

With both the objectives of the Assessment Committee and the strategic plan in mind, we developed a voluntary two-part "Introduction to Assessment" workshop open to all staff, which was delivered in the fall of 2015. The goals of this workshop were twofold: to increase awareness and understanding of assessment practices, applications and outcomes in the library, and to increase staff engagement and interest in library assessment.

Active Learning Framework

Inspired by two case studies[2] examining assessment of circulation policies and fines, we decided to employ an active learning framework through a participatory exercise with a real-world example.

Active learning is a pedagogical approach based on the principle that by actively participating in a learning process, participants learn and retain more than if they are a passive audience for the delivery of information. In *Active Learning Techniques for Librarians*, Walsh and Inala suggest that, "by being involved in the learning through doing, discussing, questioning and applying, there is more emphasis on learners working it out for themselves and developing a better understanding than if they were just given the information."[3] Another element of active learning is that participants employ their own prior knowledge and experiences to participate in the learning activities. Individual learners' expertise and perspective is thus shared within the actual learning process.

Introduction to Assessment Workshop

Design

The workshop consisted of two 90-minute sessions. During the first session, there was a brief and general overview of assessment, and various examples of current and past assessment activities from the library that participants would be aware of, but not necessarily think of as assessment. This was followed by the introduction of a case scenario on loan policies:

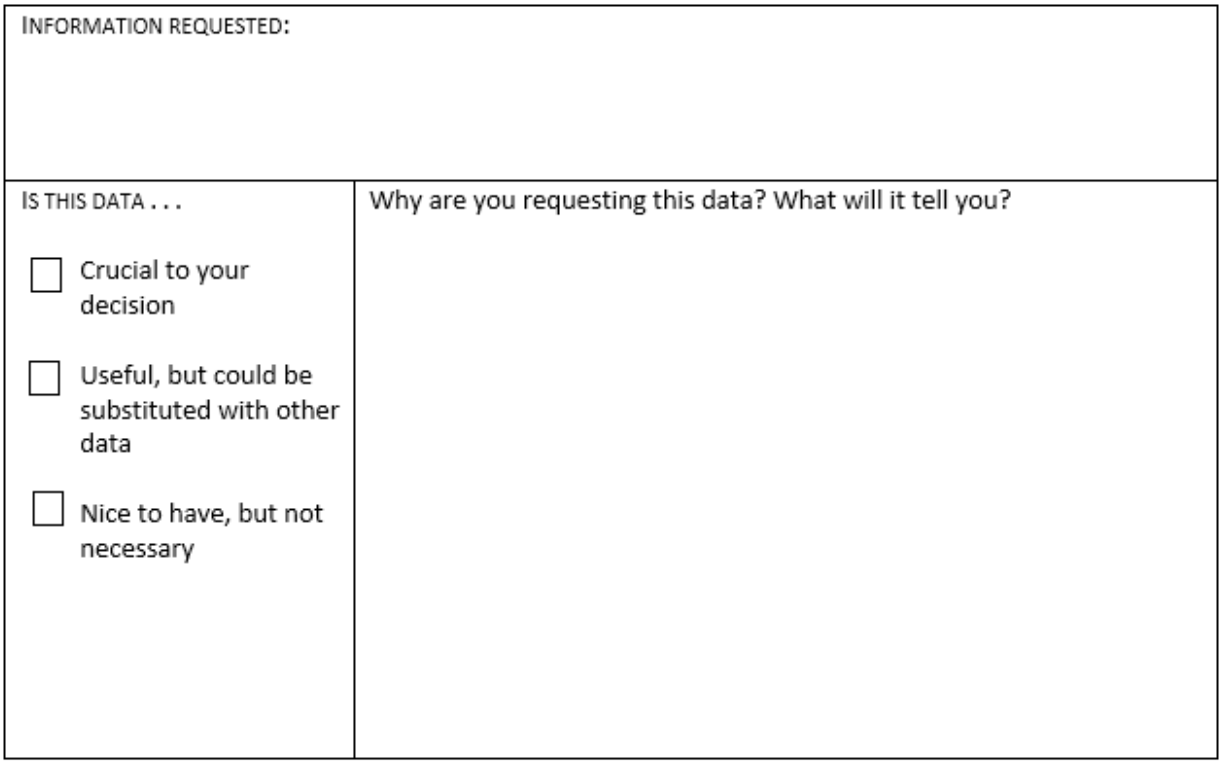
> A request was made through the suggestion blog to extend due dates on books. You have been asked to gather and analyze data that can be used in the decision-making process and to submit recommendations as to whether the library should modify its circulation policy.

The case scenario surrounding circulation was carefully chosen so that it did not focus on staff productivity or workflows. It was very important that no staff members attending from any sector of the library felt that their particular roles or duties were being scrutinized or held up for general

discussion by the library as a whole. Framing the activity as a student request for longer loan periods was a scenario easily recognized and understood by all staff, as well as an example that was not tied specifically to job performance.

After the presentation of the scenario, participants were divided into groups and asked to discuss what information and data would be useful for them to have in hand to address the scenario recommendation. They were also asked to provide a rationale as to why they were requesting this information and what they thought the data would tell them. Additionally, they were also asked to rank this information as either (a) crucial to the decision; (b) useful but could be substituted with other data; or (c) nice to have but not necessary. This was all recorded in a worksheet that they were required to hand in at the end of the first session (see Figure 1).

Figure 1. Information request form from Session 1 handout



During the second session, participants were provided with some of the data they requested. The sessions were scheduled so as to give us time to gather as much of the requested data as possible between the first and second sessions. Given the 90-minute time constraints of the sessions, it was necessary to do some of the data analysis for the participants and present graphs, tables, and figures, as opposed to raw data. Along with the graphs, tables, and figures, we also outlined some of the data's limitations (i.e., what it told us and what it did not tell us, and what assumptions could not be made based on the data). The participants were then given a copy of the data, divided into groups, and given time to further analyze and discuss before being asked to deliver a recommendation on the case scenario. In addition to providing a recommendation on extending the loan periods, they were asked:

- Which data was the most important when making your recommendation? Why?
- How would you assess the impact of your recommendation?

Scenario Recommendations

In total, there were seven groups that participated in providing a recommendation on the scenario. All seven recommendations were different. This in itself was educational, as it demonstrated how personal experiences and biases influence how we look at the data: even after being informed of the limitations

of the data, there were still groups who made assumptions not warranted by the data or who chose to focus on one specific dataset and disregarded others. Many groups considered different data points to be of varying levels of importance. However, during the discussions in the second session, it became apparent that there was one piece of data, frequency distribution of loan length by patron type, which would have enabled them to make a decision, but it was data that we were unable to provide for the workshop. Many groups acknowledged this missing data as a factor that kept their recommendation from being complete, or that they were not confident in their recommendation.

There were two distinct themes to the recommendations: length of loan period and renewals, and issues surrounding recalls. In terms of recommendations around the length of the initial loan period, four groups were largely in favour of the status quo with slight policy adjustments, while three groups were in favour of extending the loan period.

While the recommendations provided by the workshop participants were secondary to the main goals of the workshop, in keeping with the proposed scenario, we submitted a final report on the case scenario to the Library Administration Team. Therefore, after the workshops, we needed to synthesize the data and these various recommendations. Initially we had hoped to provide a summary report with one recommendation. However, given the vastly different recommendations, we opted to outline the implication and limitation of the data all the groups consulted, and presented the commonalities in the recommendations as well as the differences. We circulated the report for feedback amongst workshop participants before submitting it to the Library Administration Team.

Findings

The two primary goals of the workshop were to increase awareness and understanding of assessment, and to further staff engagement with library assessment. To that end, we created pre- and post-workshop questionnaires that participants were asked to complete. The purpose of these questionnaires was to gauge participants' baseline knowledge (and subsequent learning) of and attitudes towards assessment.

The pre-workshop questionnaire showed that the participants felt they had a fairly good understanding of assessment; impressions of their own understanding improved after the sessions (see Figure 2). We also asked what tools and data sources can be used in assessment, and instructed participants to select as many options as they felt applied (see Figure 3). All of the options provided were mentioned during the first workshop as tools involved in assessment. There was a slight increase in the proportion of responses for each option in the post-workshop questionnaire. The "other" option allowed participants to write in responses. Before the sessions, the only "other" responses suggested using "Staff feedback" and "Benchmarking." After the second session, the "other" responses suggested "Knowledge of software and systems" and "Common sense."

Most telling was the change in the participants' understanding: there was a question that asked them which of their current tasks contribute to library assessment. On the pre-workshop questionnaire, there were three responses of "none." On the post-workshop questionnaire, the examples provided by participants of their tasks were more specific, and no one replied with "nothing" or "none."

Figure 2. Pre- and post-workshop self-described understanding of assessment

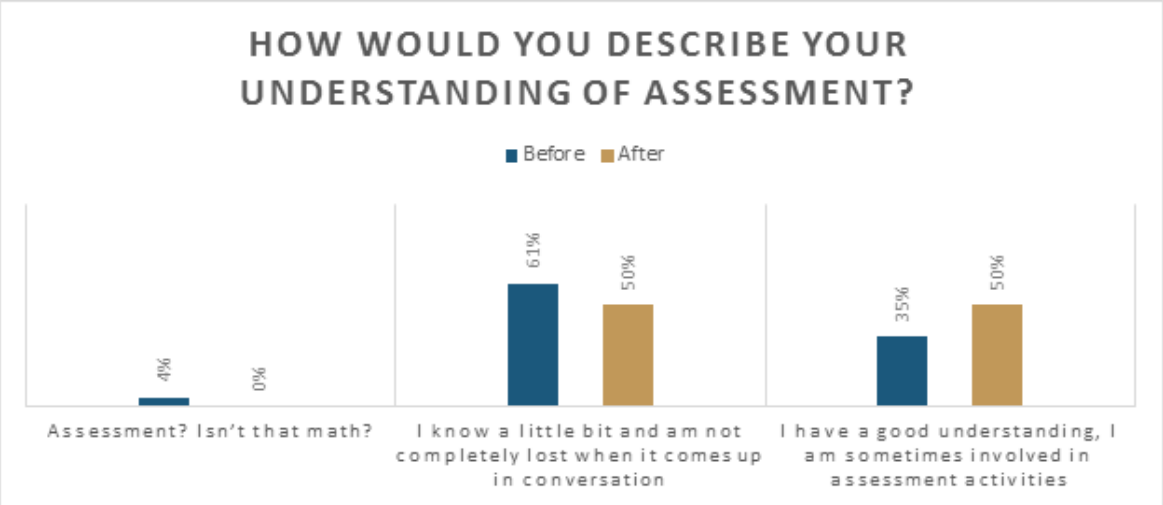
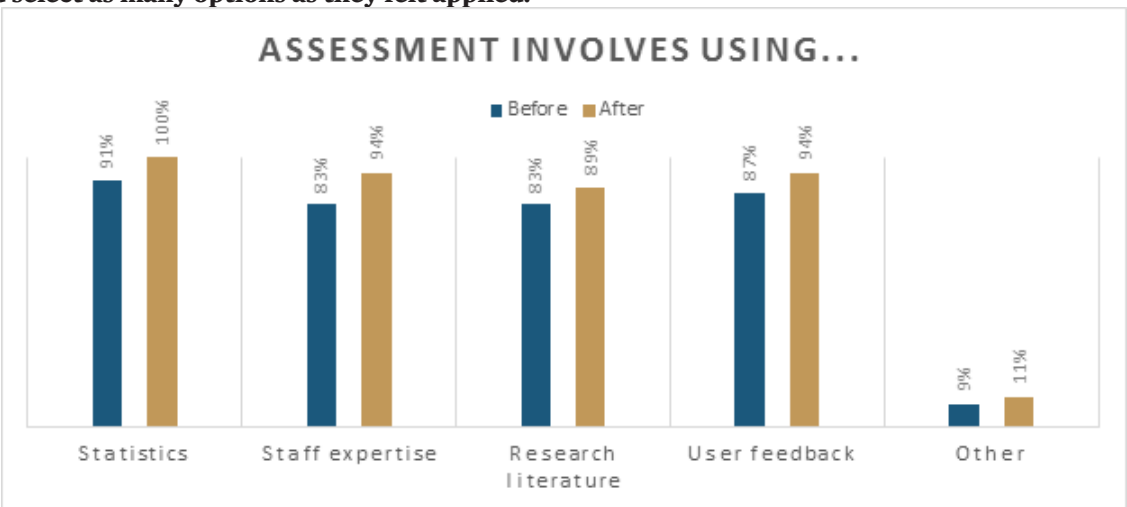


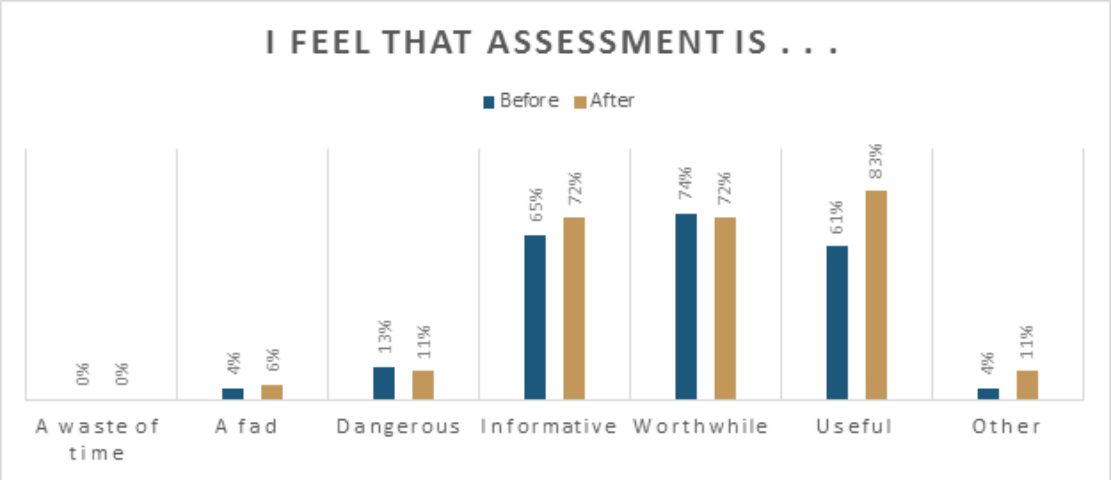
Figure 3. Pre- and post-workshop understanding of assessment tools and data sources. Participants could select as many options as they felt applied.



To track any changes in attitude, we asked participants to complete the phrase, "I feel assessment is..." allowing them to pick as many words as they found appropriate from a provided list. There were an equal number of negative and positive descriptions.

As shown in Figure 4, no one felt at either time that assessment was a waste of time. The "negative" sentiment choices did not significantly shift after the second session; however, there was an increase in the proportion of participants who felt that assessment was informative and useful after the workshop. There was also an "other" option, which allowed participants to write in responses. Before the sessions, the only "other" response was that assessment is "important for achieving goals." After the second session, there were two "other" responses. One felt that assessment is "necessary" and the other provided a caution—that it "may be difficult to maintain objectivity when using assessment tools."

Figure 4. Pre- and post-workshop attitutes towards assessment. Participants could select as many options as they felt applied.



One question, appearing only on the final questionnaire, asked respondents if they would be interested in learning more about assessment. Eleven respondents said yes, six were undecided, and one said no. Presumably, the majority of participants attended the workshops due to an interest in assessment; nevertheless, while the sessions may have satisfied some participants, 61% still remained interested in learning more about the topic, which is a positive indication towards increased engagement with assessment.

The final question on the post-session questionnaire asked if participants had any comments about the session itself or ideas for future sessions. The responses received here indicated that participants enjoyed the active learning component of the sessions as well as the opportunity to collaborate and brainstorm with staff and librarians from other departments:

> Loved the participation aspect.

> ...having the scenario and the breakout groups, especially the chance to work with people from different departments, was a really great way of approaching the issue and giving context to assessment.

> I enjoyed the active portions of the sessions, to encourage us to think about and work through the process.

> It was a useful exercise and it was great to have librarians and staff mixed up at tables to get various opinions and expertise.

Practical Implications

Given that the first annual objective for 2016/2017 stemming from Concordia Library's new strategic plan is to "Develop a training plan for support and technical staff,"[4] an immediate implication for our institution is that the active learning workshop structure can provide a template and model for other training initiatives to follow.

In a more general sense, these workshops are an example of assessment outreach to current library staff. This is a manageable and effective way to increase the discussion around assessment at an institution. By opening up the workshops to all library staff, it brought together people from every sector of the library, allowing them to share perspectives.

Conclusion

The sessions helped demystify assessment, as all participants were able to see the complexities of assessment and interpreting data. Establishing a positive staff attitude towards assessment cannot be achieved in a one-time workshop; this was simply a starting point. Feedback from the workshop indicated that participants very much enjoyed the participatory and cross-departmental nature of the sessions, and when asked if they were interested in learning more about assessment, the majority responded positively. Additionally, discussion

from the workshops has spread through word of mouth, and several people who did not attend have expressed interest in future sessions.

Although there was initial resistance to the concept of assessment, there is demonstrated interest by staff in participating in these processes, as well as seeing and acting on the results. Beyond the initial goals of the workshops, the sessions functioned as a learning experience for the committee, and are helping shape our perspective of the committee's role as facilitators in decision-making processes.

Acknowledgements

Many thanks to our assessment assistant Stefan Bunea for his invaluable aid with gathering the workshop data and Dubravka Kapa, chair of the Assessment Committee, for acting as a sounding board and helping us set the direction of the workshops.

Notes

1. For more information, see Inspiring Success: Concordia University Library Strategic Plan 2016/21, http://library.concordia.ca/about/plan/strategic-plan.pdf.

2. Kathleen Reed, Jean Blackburn, and Daniel Sifton, "Putting a Sacred Cow Out to Pasture: Assessing the Removal of Fines and Reduction of Barriers at a Small Academic Library," The Journal of Academic Librarianship 40 (2010): 275–280, doi:10.1016/j.acalib.2014.04.003; Duane Wilson, "Why Can't They Keep the Book Longer and Do We Really Need to Charge Fines? Assessing Circulation Policies at the Harold B. Lee Library: A Case Study," Journal of Access Services 11 (2014): 135–149, doi:10.1080/15367967.2014.914815.

3. Andrew Walsh and Padma Inala, Active Learning Techniques for Librarians: Practical Examples (Oxford, UK: Chandos, 2010), 5.

4. For more information, see Inspiring Success: Concordia University Library Strategic Plan 2016/21, http://library.concordia.ca/about/plan/strategic-plan.pdf.

Assessment Planning in the Time of Change

Laurie Borchard and Charissa Jefferson
California State University, Northridge, USA

Abstract

Creating effective assessment plans are a challenge, especially when academic libraries are constantly evolving. This case study provides the experience of a library that aimed to develop an assessment plan that aligns with strategic goals, provides a reporting structure and actionable items, and ensures that the plan could and would be implemented in a timely manner. During the planning phase, it is imperative to assess the current library climate, consult with everyone in the library, and collect preliminary data to determine what the needs of the library are. The purpose of this paper is to provide best practices for developing library assessment plans.

Introduction

Libraries are constantly evolving and our library is at a time of large institutional and professional change. We are undergoing strategic planning, library morale team building, implementing a new library management system, adopting the ACRL framework, and additional university-wide initiatives. Our library assessment plan aligns with university and library strategic goals in anticipation of upcoming major changes in instruction, technologies, and personnel workflows. This paper provides best practices for creating an assessment plan for academic libraries. When in the design phase of an assessment plan, there are multiple factors to consider such as utilizing relevant data gathering tools, incorporating an evaluation of the internal organizational climate along with external performance, and determining potential external influences.

Overview of Assessment Planning

There are a variety of ways to accomplish assessment plan design. Applegate[1] provides five design strategies to assessment plan creation, all of which must be comprehensive, feasible, and organized. Plans can use existing data and add context, use a strategic plan to map quantity and quality indicators, evaluate departmental functions, score performance indicators that alert to problem areas, or create a grid to match academic department goals with measures of those results for which the library is responsible.

Each of these design approaches is not necessarily exclusive from one another. There may be combined or layered approaches to Applegate's planning design. Perhaps the best example of this is with UC Berkeley Library. Loo and Dupuis[2] explain how the UC Berkeley Library approached assessment planning by strategically aligning to evaluate its organizational functionality and performance with wider academic goals and priorities.

Using Academic Program Review reports, UC Berkeley Library developed its evaluation by examining its organizational role in the academic department program. The library conducted a self-study to examine and propose new fiscal and personnel models, as well as approaches to enhancements in services and organizational structures. In this example, the organization aligned itself with the institutional goals and outcomes that will inform an assessment culture that continuously demonstrates value of the library's contributions. The library added qualitative context to the quantitative data, ensuring a human-centered approach to capture the phenomena to motivate personnel. By using a strategic plan to prioritize and validate efforts, the library has been able to enhance the organization with evidence-based procedures.[3]

Regardless of how a plan is designed, it is essential that each plan communicates the content and frequency of data gathering as well as who is responsible in the data collection on that schedule. While having a plan is not necessary to be able to conduct assessment, having the plan and evaluation schedule helps library personnel see why assessment is important and what the data contributes to value, accountability, and informed decision making. The evaluation plan reflects areas of importance to the organization and aims to streamline efforts in data collection by preventing duplication.[4]

The purpose of assessment is to measure the quality of effectiveness of the organization in achieving the outcomes of the parent institution that it supports.[5]

With institutional attention on student retention and achievement, it is the library's services, physical space, collections, and administrative processes that are evaluated as related to shaping the desired outcomes of the students and teaching faculty. The assessment plan focuses on which measurements will be sufficient to demonstrate the library's organizational performance and how it contributes to the institution's advancement. Assessment plans evaluate workflows, processes, and procedures as they pertain to those objectives of the external organization, the parent institution. Because assessment is tied to outcomes of the institutional mission and goals, performance review may never reveal worthy information of personnel matters that would be valid concerns to library administration. It can be problematic to overlook areas within departments of the library that have discord, dysfunction, or contentious working relationships.

Tryon and Snyder address developing an assessment plan that incorporates internal factors relating to improving work quality in the pursuit of the efficient and effective workflows that the organization is being evaluated upon externally.[6] It is the means which justify the end. Assessment plans can be difficult to implement if library personnel find that evaluation and measurements are yet another task to do. However, if the purpose of assessment itself is to improve the quality and efficiency of the work, and have the ability to use metrics and data to support decision making and justify needs, it is more likely that personnel will see that internal needs are being met by these measures. For an assessment plan to succeed, only the most useful metrics and deliberate data are conducted and integrated into workflows for the purposes of their improvements. By building a culture of assessment in the organization, the focus becomes more on the capacity for affirming decision making and in the pursuit of quality improvement. The expectation to engage in assessment must be accomplished through fostering an environment of trust and transparency of data sharing.[7]

Taylor and Heath stressed the importance of communicating inclusivity with library personnel so as to focus more on human capital.[8] Where metrics were associated with the accomplishments of library initiatives, the targeted measures specifically sought to lead to results that provided predictive information and guidance by asking, "If we are successful in accomplishing this strategic objective how will we know?"[9] Optimizing staff and resources enables organizational accountability that focuses on actionable measures.

Context

California State University, Northridge (CSUN), is located in the San Fernando Valley just north of Los Angeles. Student enrollment is around 40,000, serving mostly undergraduate students. The president of the university has set forth a list of priorities that include student learning, employee engagement, and increasing faculty research. There is an assessment group with a representative from all nine colleges that meets on a regular basis.

The Oviatt Library had an assessment librarian in years past, but now has a team of three faculty librarians serving on the assessment team (A-Team). Our previous six-year assessment plan expires in 2016. This plan focused on assessing the ACRL Information Literacy Standards, Library Collections, and Library Services. Unfortunately, this plan was very broad and the assessment of collections and instruction was never carried out. The A-Team has a rotating membership so every three years the membership changed. The previous plan did not have a reporting structure and the outcomes were not very specific, making it difficult to implement. Obviously three librarians do not have the ability to do all assessment within the library.

Our Approach to Assessment Planning

Library Climate

It is no secret that libraries are constantly evolving, and we are going through multiple changes that may affect our assessment and the types of activities we focus on. We wanted to be cognizant of current and future projects that may or may not have an effect on how we approach assessment, our timeline for implementation, and possible integration of assessment into existing projects.

The Framework for Information Literacy is the biggest change/challenge for our information literacy programming. We have developed a working group and are in the process of coming up with best practices for teaching. We are also participating in a CSU-wide pilot assessment of our freshman composition courses.

We are in the process of implementing a new Unified Library Management System (ULMS); this is a CSU project. This project means that all of our backend processing will be completely different and we will

have a new discovery interface. We have a large amount of staff undergoing intensive training and they will literally be learning how to do their job in a completely different environment.

We completed ARL's ClimateQUAL®, which is an assessment of library morale, including employee perception of diversity, policies, procedures, and job satisfaction. As part of this process, we also held team-building workshops which created an open forum for discussing some of the issues that came up in ClimateQUAL. We also began having more presentations and discussions about diversity in the workplace, including the Privilege Walk.

The library has taken on new roles in the past six years. We have an institutional repository, we have been doing more outreach for assistance related to copyright, we coordinate the campus Open Educational Resources (OER) initiative, and we have been experimenting with library publishing. We also just started strategic planning for the entire library.

Implications:
- How can assessment be embedded into already existing projects?
- Will existing projects affect our ability to do assessment and commit to various projects?
- Where do the new roles the library has taken on fit into our plan?
- How can we incorporate the university's strategic goals into our plan?
- How can we work with library strategic planning to help inform our plan and vice versa?

Best Practices:
- Make sure your plan aligns with the university's goals, as well as the library's.
- Review initiatives that can help or hinder the implementation of your plan.
- Evaluate the previous plan to determine what worked and what did not.
- Make sure your plan is not too broad, but specific enough.
- Assess whether your plan implementation is feasible within a specific amount of time.

Who to Consult?

Everyone! We were a team of four (three reference and instruction librarians and one collections librarian—no staff). We knew that four people were not going to be able to do all the assessment for the library, and that the problem with the previous plan was that it was not clear exactly who was responsible for carrying out various assessments. In order to make our plan successful and to get more involvement, we decided to consult with everyone during the planning phase. We wanted to make sure that we understood what their priorities were and what projects could potentially help or hinder larger-scale projects.

We started with coordinators of collection development, information literacy, and reference. We discussed their priorities relating to assessment in order to establish overlap or opportunities for the assessment team to assist with projects. We also wanted to get a sense of already existing working groups or committees that might assist with carrying out the assessment plan. We also asked individual librarians to share their assessment activities.

We consulted with the associate dean who used to be the previous assessment librarian. She gave us input on past projects and we discussed our future plans with her.

We also investigated the campus to determine what the assessment priorities were, as well as see what kind of help or opportunities there were.

Implications:
- Understanding the priorities of others and already existing working groups helped us develop a reporting structure for implementation.
- Better understand what the role of the assessment team would be.
- Are there people on campus who can help provide funding for incentives, grant opportunities, consultants for survey development and research methodology?

Best Practices:
- Make sure people are on board.
- Develop a timeline and reporting structure.
- Collaborate with everyone in the planning and implementation phases.

Data Gathering

We wanted to get a sense of the data that the library is already collecting and what we are doing with it. We already know the library is required to report statistics to ACRL on the use of our collections, instruction, reference, circulation, ILL, personnel, and expenditures. However, we know that various

service points collect data that is much more granular and we wanted to know exactly what was being collected, how it was being collected (what software or tools people were using), how often the data was collected, and what was done with the data. We also felt this would give us a sense of the culture of assessment within our library. Were our colleagues analyzing the data they collect? Were they changing services or resources based on their data collection? We felt this would also give the assessment team an opportunity to collaborate with our colleagues in assisting them with their assessment.

We surveyed all the service points and supervisors in the library and we discovered that a lot of granular data was being collected on a daily, semester, and yearly basis. We learned that, although a lot of our colleagues used our ILS and *LibAnswers* to run reports and track statistics, there were also a lot of manual observations and tabulations being done. We also discovered that, although we were collecting a lot of statistics, there was not always time to analyze the data and not everyone was making updates to services points or our collections.

We also reviewed assessment that we had done in the past, which included a large student survey on the use of our physical space, service points, and collections. We also had a Usability Group within our library that had conducted several usability studies on our website, but nothing had been done in several years. We discovered that we have not done anything to assess faculty or staff's use of the library.

Implications:
- There needs to be more guidance and collaboration across the library on assessment.
- There is potential for new tools and technology that could help with data collection and analysis.
- Previous data collected from student survey and usability testing could inform our assessment priorities in our plan.
- Faculty outreach and assessment is lacking; this needs to be a huge priority.

Best Practices:
- See what is being collected in your library and what assessment is already being done.
    - Are there any gaps? Are there services or populations that are being overlooked?
    - What type of assessment would help moving forward (i.e., surveys, focus groups)?
- Is there anecdotal data? For example, senate meetings, faculty workshops, reference desk, reserves, ask people who work directly with students and staff in different capacities.
- What assessment projects should you continue and what new assessments do you need to make a priority?

Findings

The assessment team found that the previous assessment plan was difficult to implement because it was put on the shoulders of one librarian. The team sought to organize an evaluation reporting structure that involved the entire library organization. The library assessment team organized the assessment plan to measure five years of organizational performance in the three areas of information literacy, space and services, and collections to be conducted on a continuous rotation. When one area is being assessed, another area's data is being analyzed, and another's results and recommendations are being shared.

Having recently conducted a student survey almost two years ago about students' use of library space and services, we feel there is sufficient current evidence of the value in this area. Given that our library is migrating to a new management system, it has affected the workflows of our systems and acquisitions personnel so our collections analysis is postponed until after the new system is in place. The first area of assessment will be information literacy. We are particularly interested in library instruction learning outcomes and the ACRL Threshold Concepts. In conjunction with the library's framework working group led by our information literacy instruction coordinator, the library assessment team is in the process of developing information literacy instruction evaluations for the first cycle.

While still undergoing the strategic planning cycle, the assessment team has found it necessary to develop collaborations with persons responsible for specific areas in the library to create a plan that is feasible and reflective of strategic initiatives. The assessment team has laid out the plan for what is to be assessed based on the appropriate workflows and timeline of the organization, and identified personnel, specific coordinators, and working groups who are measuring their performance area. The assessment plan acts as a document that gives the timeline for what is going to be implemented and by

whom, but gives freedom to the facilitators of the evaluation to specify and design the measures that would be most effective.

In a recent survey of library area coordinators, the assessment team found that many areas are already gathering data. The assessment team plans to assist the coordinators with identifying the goals and objectives while providing guidance for measurement of those objectives, especially those that mirror the strategic plan.

The assessment team found that while many librarians are interested in gathering data to improve their teaching quality, they need some tools and resources to get started. One of the goals for the assessment team is to develop and provide a toolkit for librarians and library personnel to utilize. Additionally, the assessment team plans to sponsor assessment themed work events like a sweeps week where, during a given week, librarians can opt in to assess all of the information literacy instruction sessions with pre- and post-assessment questionnaires.

The assessment team has identified in the assessment plan the frequency and reporting structure of data collection and sharing among affected personnel and library administration. The information from the measurements, analysis, and implementation of the results will be submitted in an annual report prepared by the assessment team and shared with the campus assessment committee.

Conclusion

The library's assessment plan focuses on which measurements will be sufficient to demonstrate the library's organizational performance and how it contributes to the institution's advancement. Assessment plans evaluate workflows, processes, and procedures as they pertain to those objectives of the external organization, the parent institution. Plans can use existing data and add context, use a strategic plan to map quantity and quality indicators, evaluate departmental functions, and score performance indicators that alert to problem areas, or create a grid to match academic department goals with measures of those results for which the library is responsible.

For an assessment plan to succeed, only the most useful metrics and deliberate data are conducted and integrated into workflows, for the purpose of their improvements. By building a culture of assessment in the organization, the focus becomes more on the capacity for affirming decision making and in the pursuit of quality improvement.

The best practices of library assessment plan design include consulting with library personnel on their current data measures and identifying the gaps or duplication, developing a timeline and reporting structure for who is responsible, and ensuring that assessment is part of the personnel and organizational culture by implementing human-capital value in the measures.

Endnotes

1. R. Applegate, "Designing Comprehensive Assessment Plans: The Big Picture Leads to the Little Picture," *ACRL Fourteenth National Conference* (Seattle: ACRL, 2009).

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3. Ibid.

4. Applegate, "Designing Comprehensive Assessment Plans."

5. Raynna Bowlby, "Living the Future: Organizational Performance Assessment," *Journal of Library Administration* 52, no. 6 (2012): 626–652, doi:10.1080/01930826.2011.601627.

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7. Ibid.

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Making It Work: Developing a Student-Centered Assessment Model for a Large-Scale Information Literacy Program

Rachel W. Gammons and Lindsay Inge
University of Maryland, USA

Abstract

Information literacy instruction presents a difficult balance between quantity and quality, particularly for large-scale general education courses. This paper discusses the overhaul of the freshman composition instruction program at the University of Maryland Libraries, focusing on the transition from survey assessments to a student-centered and mixed-methods approach using qualitative reflections, rubrics, and the evaluation of student artifacts.

Introduction

Information literacy instruction presents a difficult balance between quantity and quality, particularly for large-scale general education courses. The desire to provide high-quality instruction often conflicts with the realities of staffing, space, budgets, and time. For the University of Maryland (UMD) Libraries, this is best demonstrated in the instruction program for freshman composition, formerly known as "Library Day." Extending as far back as 1995, "Library Day" has formed the foundation of first year programming in the libraries. Each year, the libraries provide information literacy instruction to 95% of English 101 sections, leading an average of 215 sessions across the fall and spring semesters.

Early on, the demand for instruction outpaced the capacity of User Education Services (UES), which managed its operation. In 1999, UES began meeting the demand by hiring part-time special lecturers, a practice which continues to this day. While the influx of instructors increased the ability to provide instruction, managing the program left little time for innovation or creativity, particularly within the lesson plans and assessments. By fall 2014, instructional materials and assessment methods that had been considered progressive for their time were beginning to show their age. Instruction was based on a script, which had changed little in the previous decade, and assessment centered on a four-question survey that measured students' ability to perform basic skills, such as correctly utilizing a Boolean operator. Disquiet with the program had spread outside the library, as course instructors had grown weary of sitting through the same library presentation semester after semester, year after year. Although the composition program had continued to update the syllabus and improve their assignments, the libraries had not, and the need for change was apparent.

In spring 2015, Teaching and Learning Services (TLS), formerly UES, began the process of overhauling "Library Day," starting with the learning outcomes and moving up through assessment. This paper discusses the process by which we reinvigorated this aging information literacy program, focusing on the transition from a survey-based assessment to an iterative, student-centered, critically grounded, and outcomes-based assessment model.

Pilot Program: Spring 2015

In spring 2015, a change in leadership in the libraries and addition of new staff in TLS offered an opportunity to reimagine "Library Day" and the corresponding assessment. An increase in the number of full-time staff led to a decrease in the amount of instruction sessions led by special lecturers, down from 70% in 2014 to 50% in spring 2015. The makeup of instructors, including both faculty librarians and special lecturers, created the ideal environment for a pilot program; while the special lecturers continued to teach a modified version of Library Day, the more experienced instructors piloted an active learning-based lesson plan, which left more room for individuality and customization.

To assess the success of the pilot program, we created a simple assessment plan. At the end of the pilot session, students would be asked to share their "a-ha moment" from the learning experience. Based on the six-word memoir, this assessment would provide students with an opportunity to reflect critically on their experience and share a moment

of personal significance. To mitigate the time needed to explain and implement the assessment during each session, the six-word framework was expanded slightly; rather than six words, students were asked to structure their "a-ha moment" responses in a 140-character tweet that included #mylibrarymoment.

Students were given no restrictions beyond that their responses fit within a single tweet. Rather than measuring students' abilities to accomplish a specific set of skills, the "a-ha moment" was intended to challenge learners to sift through the session and share a moment of personal impact.

Methods

"A-ha moment" responses were collected from Twitter using two web-based programs: "If This Then That" (IFTTT) and "TAGS." Each of these required a "recipe," or a specific set of circumstances that, if fulfilled, prompted the systems to identify, collect, and archive the tweet. Tweets including #mylibrarymoment were automatically copied and saved to a Google Sheet.

After piloting Twitter as a collection tool in two sessions, we quickly identified a challenge: not only had we overestimated the amount of students that were active on Twitter, but also the amount of information they were comfortable disclosing in a publicly-accessible space. Many of the students who participated in the pilot had private accounts, which meant that, even when they authored a tweet using #mylibrarymoment, the collection tools were prohibited from accessing or archiving their tweets.

As a workaround, we added an option for students who did not have a Twitter account or had a private account to submit responses through a Google form. The Google form was connected to the same Google sheet used by IFTTT and TAGS to archive tweets using #mylibrarymoment. All responses, regardless of whether they were collected through the Google form or Twitter, were capped at 140 characters. The Twitter assessment was piloted in 12 one-shot instruction sessions for freshman composition led by two full-time library instructors in TLS and took place between February and March of 2015. Over the course of the 12 sessions, 142 responses were collected, for a response rate of 62%.

Analysis

Although the responses were interesting on their own, a systematic analysis method was necessary to identify trends in the data. In response, librarians developed a process for organizing and coding responses based on the ACRL Framework for Information Literacy. Because the "a-ha moment" was intended to measure attitudes rather than skills, a decision was made to focus the analysis on the dispositions outlined in the framework. As a team, we identified seven dispositions, pulled from five of the six frames, that best aligned with the learning outcomes for the course and represented an appropriate developmental level for first-year learners. Each "a-ha moment" response or tweet was read by the team of librarians and assigned to the disposition that best matched the content. The analysis was based on consensus, with librarians discussing each response and its appropriate placement, deliberating until a unified decision was reached.

The table below outlines the dispositions selected, types of responses assigned to each category, and percentage of responses attributed to each.

Frame	Disposition	Example	%	n
Authority is Constructed and Contextual	**develop awareness of the importance of assessing content with a skeptical stance and with self-awareness of their own biases and worldview**	"Make sure a publisher is unbiased. #mylibrarymoment."	5%	7
Information has Value	**respect the original ideas of others**	"Some books have more than one author, so you can actually cite the different chapters as different sources #mylibrarymoment"	6%	9
Research as Inquiry	**value intellectual curiosity in developing questions and learning new investigative methods**	"Learning how to use Research Port was really helpful because I was able to find so many more articles that will help me with my research"	49%	70

Frame	Disposition	Example	%	n
Scholarship as Conversation	**recognize that scholarly conversations take place in various venues**	"Working with my peers to find connections between our extremely different topics and sharing databases that wouldn't at first seem to be [applicable]."	9%	13
Scholarship as Conversation	**see themselves as contributors to the scholarship rather than only consumers**	n/a	0%	0
Searching as Strategic Exploration	**seek guidance from experts, such as librarians, researchers, and professionals**	"The librarians helped me get really helpful information from Research Port"	6%	9
Searching as Strategic Exploration	**understand that first attempts at searching do not always produce adequate results**	"#mylibrarymoment was that you could use synonyms to broaden your search within the same topic. I usually use the same words when I search."	21%	29
Other (responses that did not fit in above category)		"When I found a correlation between contracting celiac diseases and consumption of Genetically Modified Foods"	4%	5
			Total	142

Results

Although the pilot lesson plan had been updated to emphasize the scholarly conversation and importance of evaluating information, responses from students indicated they were not connecting with these ideas in the classroom, or, at the least, these concepts were not standing out as "a-ha moments." Despite the reduction of in-class time spent on database demonstrations and search strategies, the dispositions surrounding searching and retrieval continued to dominate the responses, accounting for 70% of the overall responses. Also, while we had anticipated that, being first-year students, many of our learners would share irrelevant, irreverent, or incoherent responses, only five of the 142 responses (4%) fell outside of the parameters of the analysis.

Implications

The pilot program was the first step in transitioning away from the quantitative and skills-based assessments associated with "Library Day." While reading and coding the "a-ha moments" required increased analysis time, the character limit made them easy to quickly read and evaluate. Using a coding method based on the ACRL framework enabled us to create meaning from what could have been a vast disparate pool of data. Organizing the results into the seven dispositions helped us better understand how our students self-identified learning outcomes connected to the stated student learning objectives for the session, overall lesson plan, and professional standards.

Research and Teaching Fellowship

While the pilot program offered exciting developments in both teaching and assessment, scaling up the program presented challenges. The active learning and critically-based instruction method utilized in the pilot would require a fundamental restructuring of the hiring and training of the special lecturers, who continued to carry about 50% of library instruction sessions. To address this need, TLS created a three semester Research and Teaching Fellowship. Intended to create a community of learning, the fellowship offered an opportunity to turn the special lecturer positions from an institutional crutch to a virtuous system that would give back to the university and the profession. Rather than hiring these part-time instructors in the fall, fellows would start their program in the spring, when the amount of library instruction was less demanding. While the special lecturers were hired from semester to semester, fellows would commit to teaching and learning with TLS and the libraries at large for three semesters. The first semester would focus on developing teaching and research skills through teaching observations, co-instruction, weekly readings, and online discussion board posts; the second would strengthen their efficacy as instructors through independent teaching and formal observations; and the third would center on peer training, research, and assessment.

Starting fellows in the spring would also alleviate the burden of training; senior fellows, who would be finishing their third semester, would be responsible for training junior fellows, who would be beginning their first. The fellowship offered an opportunity to improve the teaching experience for both first-year students and graduate student instructors; it would improve the freshman composition program by creating more confident teachers capable of leading engaging and individualized instruction sessions, and also give back to the profession by training conscientious and talented future librarians.

In May 2015, we hired our first cohort of four fellows and compressed the first semester of reading, discussion, co-teaching, and observation into a 10-week summer program. We updated our lesson plan, made improvements to the assessment, and developed a more sophisticated rubric to analyze the "a-ha moment" responses. Finally, and perhaps most importantly, we renamed the program from "Library Day," which implied that information literacy was confined to a single day and was not an integrative part of the research and writing process, to the more general "Information Literacy for Freshman Composition."

"A-ha Moment" Assessment: Fall 2015—Spring 2016

In scaling up the program, one of the more substantial changes was to move away from Twitter as our collection method. Although it offered an effective platform for the pilot, expanding that model from the 12 sections in the pilot to nearly 200 sections created logistical challenges. From privacy settings, to data duplication, to the number of students who were (or more often were not) active on Twitter, there was no easy way to collect the amount of data needed using social media. In response, we transitioned data collection to Qualtrics, a proprietary tool for creating web-based surveys. To keep the spirit of the "a-ha moment," we continued to cap individual responses at a discrete number of characters, although we increased the cap slightly from 140 to 150 to allow a little more room for creativity. Switching from Twitter to Qualtrics has enabled us to collect more and better quality data. It also allowed for the addition of a customized field for students to identify their library instructor, which helps to analyze trends over the larger pool of data. The result is a short, quick assessment for students that provides rich data at the program and instructor levels.

Methods

In addition to updating the collection, the analysis method was also adjusted to provide a greater level of depth and specificity. In addition to using the dispositions from the ACRL Framework for Information Literacy, a "knowledge practice" was added to account for the students whose "a-ha moment" indicated a connection with a resource or search process rather than an attitude. The final rubric includes six dispositions, one knowledge practice, and two categories to account for responses that fall outside of these parameters: comfort with UMD Libraries, and "other." Together, the dispositions and knowledge practice represent all six frames. To account for the level of development within responses for a given category, we also added levels of developing, proficient, and advanced competency for each criterion.

UMD Libraries Information Literacy Dispositions Rubric			
	Developing (1)	**Proficient (2)**	**Advanced (3)**
Authority is Constructed and Contextual			
Understands importance of evaluating information and demonstrates self-awareness of individual biases	Writer acknowledges information evaluation as concept	Writer articulates the rationale or importance of evaluating the credibility of a source	Writer demonstrates the value of evaluating a source, and indicates an understanding of the role of self-bias in the process
Information Creation as Process			
Matches an information need with an appropriate resource	Writer acknowledges that different resources are available for research	Writer identifies a type, purpose, or title of a specific resource	Writer articulates how a specific resource addresses their individual information need
Information Has Value			

UMD Libraries Information Literacy Dispositions Rubric			
	Developing (1)	**Proficient (2)**	**Advanced (3)**
Respects the original ideas of others	Writer acknowledges attribution methods	Writer articulates the value of attribution	Writer articulates the importance of attribution and identifies resources for help/attribution methods
Research as Inquiry			
Values intellectual curiosity in developing questions; consider research as open-ended exploration and engagement with information	Writer acknowledges research as concept	Writer acknowledges research as process	Writer articulates the iterative process of developing/defining a research question
Scholarship as Conversation			
Seeks out conversations taking place in their research area	Writer acknowledges that there are different points of view on a topic	Writer articulates the need to incorporate different points of view	Writer demonstrates the value of incorporating different points of view
Searching as Strategic Exploration			
Designs and refines search strategies as necessary	Writer acknowledges search strategies for narrowing or broadening	Writer articulates specific search strategies (such as key terms, subject thesaurus, etc...)	Writer demonstrates awareness of search strategies and how they can aid in student research
Seeks guidance from experts such as librarians, researchers, and professionals	Writer acknowledges assistance available	Writer acknowledges assistance available and identifies ways to get in contact with appropriate professionals	Writer articulates specific ways appropriate professionals can support students
Other			
Comfort with UMD library website, physical spaces, or specific library instructor			
Other			

Although, traditionally a rubric is used to evaluate a learning artifact by applying each of the categories, the dispositions rubric asks evaluators to assign each response to a single category and developmental level. To norm the rubric, we pulled a random sample of 50 from the more than 1,300 total responses from fall 2015, discussing each response as a group to determine which criteria and level of competency were best represented. Based on this discussion, we made slight modifications to the language in the levels of competency and reordered some of the dispositions to make the rubric easier to read. We also added a category for "comfort level with the library" and "other," to absorb responses that could not fit in any other criteria.

At the end of the semester, library instructors were given a copy of their students' responses. Each instructor evaluated their set of responses, assigning each to a criterion and the appropriate level of competency. In fall 2015, the first semester that we implemented this assessment process to scale, we added an extra level of scrutiny by having a second reviewer code each set of responses. Although we expected that reviewers would assign responses to the same criteria and that discrepancies would arise in the levels of competency within those criteria, we found there were disagreements as to which disposition or knowledge practice a single response was most indicative. The following semester, spring 2016, we resolved this issue by increasing the amount of responses put through the norming process and

providing a list of examples for each criteria and level of competency. However, the discrepancy in the data analysis did have an impact on our results for fall 2015; because there were two sets of reviewers for each response, there are twice as many final ratings as responses gathered. The results for spring 2015 are accurate for the responses collected.

Results: Fall 2015

Fall 2015 Information Literacy Dispositions									
		Advanced (3)		Proficient (2)		Beginning (1)		Total	
Rubric Criterion	Mean	% students	n	% students	n	% students	n	%	n
Authority is Constructed	1.22	1%	1	21%	32	78%	119	6%	152
Information Creation as Process	1.43	5%	67	34%	478	62%	872	58%	1417
Information Has Value	2.83	86%	51	10%	6	3%	2	2%	59
Research as Inquiry	1.56	12%	26	33%	75	55%	124	9%	225
Scholarship as Conversation	2.61	66%	25	29%	11	5%	2	1.5%	38
Searching as Strategic Exploration	1.50	7%	39	36%	204	57%	319	22%	562
Search Strategies	1.51	7%	29	37%	156	56%	233	17%	418
Guidance	1.47	7%	10	33%	48	60%	86	6%	144
Other								.5%	137
Total		8%	209	31%	806	56%	1438	2590	

Results: Spring 2016

Fall 2015 Information Literacy Dispositions									
		Advanced (3)		Proficient (2)		Beginning (1)		Total	
Rubric Criterion	Mean	% students	n	% students	n	% students	n	%	n
Authority is Constructed	1.36	1%	1	33%	23	66%	46	8%	70
Information Creation as Process	1.40	4%	23	31%	173	64%	355	59%	551
Information Has Value	1.17	0%	0	17%	4	83%	19	2%	23
Research as Inquiry	1.27	4%	2	20%	11	76%	42	6%	55
Scholarship as Conversation	1.69	23%	3	23%	3	54%	7	1%	13
Searching as Strategic Exploration	1.45	5%	10	36%	80	60%	131	23%	221
Search Strategies	1.42	3%	4	37%	54	61%	89	16%	147
Guidance	1.51	8%	6	35%	26	57%	42	8%	74
Other								.5%	33
Total		4%	39	30%	294	62%	600	966	

Discussion
While the coding of the responses takes place individually, reflection happens as a group. Reports are generated at two levels, one for each individual instructor and a second for the program as a whole. The granularity of reports allows us to see which dispositions or knowledge practices are being most often represented across all of the sessions. It also provides insight into individual praxis; if a particular instructor has a more challenging disposition represented more often in the responses for her sessions, or the responses consistently demonstrate a more advanced level of competency, we are able to talk through her instructional approach as a group to identify which pieces are resonating with students that could be applied to our teaching at a higher level.

Overall, including the assessment for both fall and spring semesters, students self-reported their most significant area of learning to be "information creation as process" (58% and 59%), which corresponds with their ability to match an information need with an appropriate library resource. The second most significant area, "searching as strategic exploration" (22% and 23%), relates to search strategies and the ability to seek guidance from experts. Very few results were indicative of the higher-level critical thinking skills, such as "authority is constructed and contextual" (6% and 8%) or "information has value" (2% and 2%). Within each of the categories, the majority of students performed at a "beginning" level (56% and 62%) and about a third of students performed at a "proficient" level (31% and 30%). Few students demonstrated an "advanced" level of competency for any of the criteria (8% and 4%). However, while dispositions associated with higher-level thinking skills, such as "information has value," were less often represented, the students that did share responses indicative of those concepts tended to connect with those ideas more deeply (ex: 86% of f15 students performed at an "advanced" level when sharing responses related to "information has value").

In many ways, these results are appropriate for a first-year student audience visiting the library for the first time in their academic career. It is reasonable and appropriate that these students would perform at a developing or proficient level in any of these concepts, and the fact that some of the students were able to demonstrate an "advanced" level of competency in any of the criteria is impressive. It is also important to contextualize these results within the broader arc of our instruction program. Had we solicited these responses even a year earlier, it is probable that all of the responses would have centered on "information creation as process," or the ability to match an information need with the appropriate library resource. That approximately 40% of responses were indicative of other conceptual frameworks shows enormous growth in our instruction process. The consistency from fall and spring semesters and the continued emphasis by students on the research process gives us the impetus to continue developing our lesson plan and push ourselves to de-emphasize even further the attention given to database demonstrations and increase the amount of time spent on critical thinking and engagement with research questions.

Limitations
Although the "a-ha moment" did not provide a direct measure of student learning, the responses provided enormous insight into our program. Mapping the responses onto the rubric also enabled us to identify trends in the data that would have been difficult to spot. It should be noted that while we did go through a norming process each semester, the assigning of responses to categories and ranking of those responses continue to be subjective. Responses could have been impacted by how the library instructor introduced the assessment, when the library session occurred during the semester, and how the evaluator interpreted and ranked the results. The results provide a general, rather than specific, overview of what students found the most meaningful from the library sessions.

Evaluating Student Artifacts: Fall 2016

In fall 2016, we piloted an additional small-scale assessment project that incorporated student artifacts to assess the impact of the updated library instruction on the academic success of freshman composition students. The assessment project focused on the annotated bibliography, one of five required assignments for the course. The annotated bibliography was ideal for several reasons. First, it occurs early in the academic term. Students are often preparing for this assignment, or have recently completed it, during their visit to the library. Second, it provides a direct measure of a student's ability to identify, utilize, and synthesize the sources discussed during their library session. Finally, the annotated bibliography asks students to identify five scholarly and popular sources. The brevity of the assignment

allows library instructors to read through the artifacts quickly, which was important given the ongoing commitment to assessment already taking place with the "a-ha moments."

To build continuity between our assessment and the assessment work occurring within the academic department, we chose to evaluate the bibliographies using a rubric currently in use by the Academic Writing Department. This rubric was developed in 2015 and is used by course instructors to assess their students' final position papers, which incorporate at least 20 sources. Although the rubric includes many criteria, three of these apply directly to information literacy: citation accuracy, selection of sources, and incorporation of sources.

The rubric below is provided courtesy of the University of Maryland Academic Writing Program.

Excerpt from AWP Learning Outcomes Rubric—Fall 2015				
	Advanced (3)	**Proficient (2)**	**Developing (1)**	**Unacceptable (0)**
Source Quality	Writer consistently integrates a rich variety of high quality and scholarly research relevant to his/her argument. The writer exceeds the audience's expectations for relevant sources.	Writer employs research that is credible and relevant to his/her argument. The writer meets the audience's expectations for appropriate sources.	Writer draws on sources that are not consistently relevant or credible. Few of these sources are scholarly. The writer may misunderstand the audience's expectations for research, drawing on inappropriate sources or ignoring important sources.	Writer rarely integrates research into his/her essay, and/or when the writer does integrate sources, they are not relevant, credible, or scholarly. The writer fails to meet the audience's expectations for relevant and appropriate sources.
Source Use	Writer effectively and expertly integrates research into the argument by means of attribution, summarizing, quoting, or paraphrasing. Writer thoroughly analyzes research and offers meaningful and persuasive explanations of how it relates to his/her argument.	Writer judiciously integrates research into the argument by means of attribution, summarizing, quoting, or paraphrasing. Writer analyzes research and explains how it relates to his/her argument.	Writer integrates research into his/her essay but attempts at attribution, summarizing, quoting, or paraphrasing are sometimes flawed. Writer may include quotations with no framing language when integrating source material. The connections between the research and argument may be missing or tenuous.	Writer's attempts at summarizing, quoting, or paraphrasing are frequently flawed. Writer may not attribute sources or frame quotations. The writer may not make connections between the research and his/her argument.
Citation	The writer expertly cites sources, both citing them correctly within the text and using correct conventions throughout the works cited list.	The writer cites sources in text and throughout the works cited list. There may be minor errors in MLA citation.	The writer attempts to cite all sources in text and throughout the works cited list, but there may be major errors in MLA citation.	The writer makes no attempt to cite sources, or the writer may attempt to cite sources, but there is no evidence pattern or style for citations.

Methods

Thirteen freshman composition instructors were invited to participate in this project. The target demographic included instructors who had worked with the library at least one semester prior. This choice was strategic: first, veteran instructors often bring their students to the library later in the semester than new instructors, which would

provide an opportunity to evaluate annotated bibliographies submitted before and after library instruction. Second, veteran instructors have worked with the library and have a vested interest in our mutual success. The hope was these instructors would not only be more willing to participate, but would also encourage students to participate in a research project.

Students enrolled in sections led by instructors who agreed to participate were asked to sign an informed consent form, which was distributed during their library instruction session. The informed consent gave the instructor permission to share a copy of that student's work with a librarian for the purposes of assessment. Students were under no obligation to participate. After the library instruction session, course instructors were sent a numbered list of students from their sections who were 18 years or older and agreed to participate in the research. The instructors were asked to upload three bibliographies from specific numbered students from the list (numbers 2, 4, and 7) from each section of their course through an online form. Course instructors were offered the option to strip identifying student information from the artifacts before submitting, or to have the confidential details removed by a library staff member after submission. Unfortunately, although all 13 instructors agreed to participate and librarians distributed informed consent to each section they taught, only four of the instructors fulfilled their commitment to participate by submitting copies of their students' bibliographies post-session. As a result, our pilot includes a total of 12 student artifacts from these four instructors. Librarians applied the rubric provided by the Academic Writing Program to the bibliographies as a team, coming to a consensus on the ranking of each category.

Results

Annotated Bibliography Assessment: Fall 2016										
		Advanced (3)		Proficient (2)		Beginning (1)		Unacceptable (0)		
Rubric Criterion	Mean	% students	n	% students	n	% students	n	% students	n	Total n
Source Quality	2.66	67%	8	33%	4	0%	0	0%	0	12
Source Use	2.12	42%	5	33%	4	25%	3	0%	0	12
Citation	2.33	42%	5	50%	6	8%	1	0%	0	13
Total		47%	18	42%	16	10%	4	0%	0	

Discussion

In our application of the academic writing rubric to the students' annotated bibliographies, we found that a slight majority of students (52%) ranked in the "beginning" or "proficient" categories. None of the students ranked in the "unacceptable" category. Students ranked highest in the category "source quality" (with a mean of 2.66) and lowest in the category "source use" (with a mean of 2.12). Our sample size was too small to identify any significant difference in performance between students who attended a library instruction session prior to submitting their annotated bibliography versus students who attended a library instruction session after submitting their annotated bibliography. While this is in part due to the small number of respondents, this may also be related to the nature of the assignment, which has explicit instructions regarding source type and format, mitigating the number of citation errors and use of popular or internet-based sources.

Limitations

The two main limitations to this study were the IRB process and the reliance on the academic writing faculty to provide copies of student artifacts. Because we planned to share our results at the Library Assessment Conference, it was important to obtain informed consent from students. This proved to be a barrier to participation. It meant that we had to take time away from a library session to explain the informed consent document and ask students to read and sign. It also required additional steps between soliciting consent and obtaining copies of student artifacts. The only way to get copies of student work was to go through the course instructors, which left our study directly dependent on their continued participation. Although all 13 of the instructors we contacted agreed to be part of this project, only four supplied us with student artifacts. This resulted in a much smaller sample size than we had originally anticipated.

Future Directions

We plan to build on the pilot by undertaking an assessment of freshman composition student artifacts on a larger scale. Starting in January 2017, our department will gain a full-time first year experience librarian who will oversee assessment of the library's freshman composition instruction. We would like to expand this assessment model to include each of the five required assignments for the course, collecting student artifacts and applying the AWP rubric to one assignment per year. The hope is that this continued assessment, combined with the on-going "a-ha moment" assessment, will help us identify at which points in the semester library instruction is most impactful.

To address the limitations of this study, we will lower the barrier to participation for students and course instructors. Future assessments, which will only be used within the department to improve our practice, will be able to proceed without the need for informed consent procedures, eliminating several steps between the introduction of the assessment to course instructors and the collection of student work. We also plan to collaborate more explicitly with the director of the program to publicize the assessment project and share results. Finally, one of the goals for the first year experience librarian is to become embedded in the AWP assessment, in which they apply an expanded version of the rubric to the students' final assignment for the semester, the position paper. Working together to share assessment processes and results will enable each department to gain a better understanding of how our assessment efforts can complement and reinforce one another.

Conclusion

The assessment of student learning on multiple levels has changed our approaches to teaching within the department, but also the library at large. Librarians have made radical changes to the teaching outline for freshman composition, emphasizing active learning and paring down the amount of resources discussed. The hiring and training of special lecturers was also transformed. Rather than hiring lecturers a few weeks before the start of the semester, the Research and Teaching Fellowship requires a three-semester commitment on behalf of participants, developing teaching skills over multiple semesters and providing a supportive learning environment for teachers and students. As a result of these changes, the relationship between the libraries and the composition program has improved. Composition students are retaining more information from the session and are engaging with material on a deeper level. Library instructors are more satisfied with their teaching experience, which creates opportunities for more positive interactions with students and course instructors.

Multi-Method Assessment to Improve Library Instruction

Zsuzsa Koltay and Kornelia Tancheva
Cornell University, USA

Introduction

Improving students' information literacy skills[1] has long been a significant part of academic libraries' core mission, tying them directly to the fundamental educational mission of their institutions.

It is not surprising, then, that academic libraries invest a lot of time and effort into instruction, both collectively and individually. In 2013–2014, for instance, 122 member libraries of the Association of Research Libraries (ARL) reported 140,510 library presentations to groups, 119,148 of which were held at 114 academic libraries in the US and Canada.[2] Even accounting for other types of presentations, variations in reporting, human error, or other ambiguities of interpretation, it is reasonable to assume that about 100,000 of those presentations were *bona fide* library instruction sessions. Assuming an average length of an hour per session, and a very conservatively estimated preparation time of two hours per session, the ARL community spent an estimated 300,000 hours or the equivalent of 7,500 workweeks on library instruction in 2013–2014. Averaged out over the 114 academic ARL members that reported in this category, the average library taught 877 sessions and spent 2,632 hours or 66 workweeks on these classes.

Much more precise calculations can be performed for individual institutions, including the total number of hours each instructor spent either teaching or preparing for a class, if the number of instructors is known. At Cornell University Library, for instance, in 2014–2015 we recorded 1,098 instruction sessions. Using the same estimate of 1 hour of class time and 2 hours of preparation time per session, we spent 3,294 hours either teaching or preparing to teach. With a high estimate of 50 librarians whose assignments included instruction among many other responsibilities for that particular year, each instructor spent around 66 hours that year on instruction. Clearly, library instruction is a major area of resource investment both at our institution and in the ARL community as a whole.

Given the amount of effort invested in library instruction, it is understandable that the profession has long emphasized both guiding and assessing these efforts. The *Information Literacy Competency Standards for Higher Education*,[3] approved by the Board of Directors of the Association of College & Research Libraries (ACRL) in 2000, have guided library instruction efforts for 16 years. These standards define information literacy as a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." It was only in June 2016 that the ACRL's Board of Directors rescinded the standards, having adopted the much broader *Framework for Information Literacy for Higher Education* in January 2016.[4] The latter focuses on information literacy through six "frames": authority is constructed and is contextual, information creation is a process, information has value, research as inquiry, scholarship as conversation, and searching as strategic conversation.

The question of assessing library instruction is pertinent to both the standards and the framework, although the methodologies are somewhat complicated. For a long time (and perhaps still to some extent), library instruction evaluation depended primarily on the use of input measures. However, in recent years, outcomes-based assessment has heavily influenced the library instruction community. Elaborating meaningful outcomes-based assessment measures for the six frames is arguably harder than for the earlier standards, as the skills associated with the frames are more dependent on and influenced by the whole educational experience of the student and not just library instruction.

Input measures are the easiest to collect and compare, of course: e.g., number of sessions and number of participants over time, possibly benchmarked against other institutions. Although input measures are relationally useful (how are we

doing compared to past periods or to our peers?), there has been a lot of interest in developing outcome measures for more meaningful evaluation. Reaccreditation guidelines in higher education have advanced practices of learning outcomes assessment, so measuring student skills against learning goals has become more widespread. It is relatively easy to develop outcomes-based assessment for the ACRL standards for information literacy competency by measuring the degree to which the students are able to meet the learning goals of locating, evaluating, and effectively using information pre- and post-library instruction. This kind of outcomes-based assessment of library instruction is universally accepted theoretically, even if not yet practiced everywhere. Creating an outcomes-based assessment methodology and constructing relevant instruments to measure whether students have mastered and can transfer knowledge related to the six information literacy frames will probably take longer and may very well reach the impasse that seems to define the current debate around correlating library instruction (or use of the library in general) to student learning outcomes.[5] All of the frames go well beyond library instruction and, in that sense, it would be difficult to argue for any correlation, much less causation, between library instruction and critical thinking development, for instance.

While useful learning outcomes-based assessment measures that are grounded in the *Framework for Information Literacy* are the aspirational goal, critical thinking, and especially growth in critical thinking over time, is notoriously difficult to assess. In the meantime, as an active participant in the process of higher education, the academic library is required to evaluate the success of library instruction, both for service improvement and resource allocation, or as a performance indicator for library instructors.

The evaluation can employ various formats and methodologies—from satisfaction surveys, through measuring learning goals achievement (or perception thereof) at the end of library instruction sessions, to anecdotal evidence, which can span the spectrum from repeat customers, to thank-you notes. Very often, these are all conducted or received immediately following an instruction session, which can impact the responses positively.

What happens if overall perceptions of helpfulness and value from the two most important stakeholders of library instruction—faculty and students—are collected long after a specific library instruction session in the broader context of an overall assessment of the library or the entire academic experience? What can we learn from such data and how can we use what we learn to improve our instructional offerings or rethink library instruction altogether? And how can we reconcile data that seem contradictory?

Below we describe a Cornell University Library project—a case study of triangulating from various data sources and using findings and further investigation to create and assess the success of a pilot project intended to improve the student experience, not just their skills.

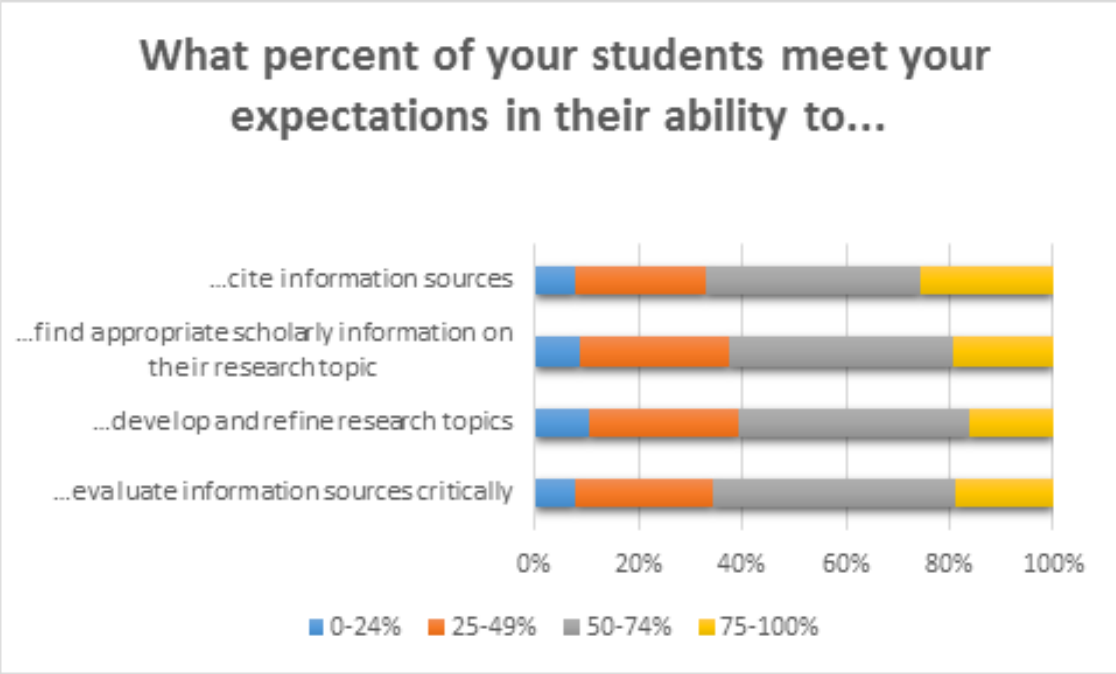
Faculty see student need and positive impact of library instruction

Cornell University Library conducted a locally designed census survey of its entire faculty in 2014 with an overall response rate of 46% (48% among tenured and tenure-track faculty).[6] The survey subjects answered questions about a wide range of topics including their perception of the information literacy skills of their students, their use and the perceived impact of library instruction, and, for those who do not use library instruction, the reasons for forgoing this service.

Faculty are less than satisfied with the information skills of their students. University-wide 33–39% of faculty said that fewer than half of their undergraduates meet their expectations when it comes to the following four major information literacy competencies:

- Citing sources, according to 33% of faculty
- Finding appropriate scholarly information on their research topic, according to 38% of faculty
- Developing and refining research topics, according to 39% of faculty
- Evaluating information sources critically, according to 35% of faculty (Figure 1)

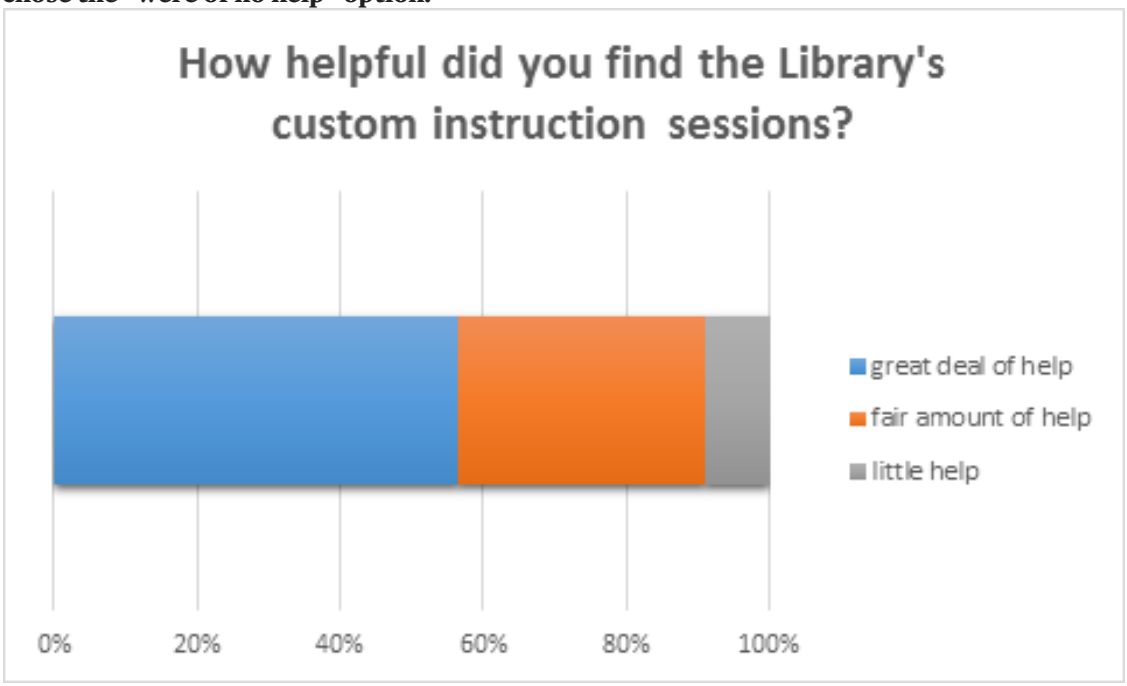
Figure 1: In 2014, 33–39% of Cornell faculty said that fewer than half of their undergraduate students meet their information literacy expectations.



On a more granular level, at some Cornell colleges and schools, the situation is even direr. For example, at one particular school, up to 73% of faculty found that fewer than half their students had these important skills.

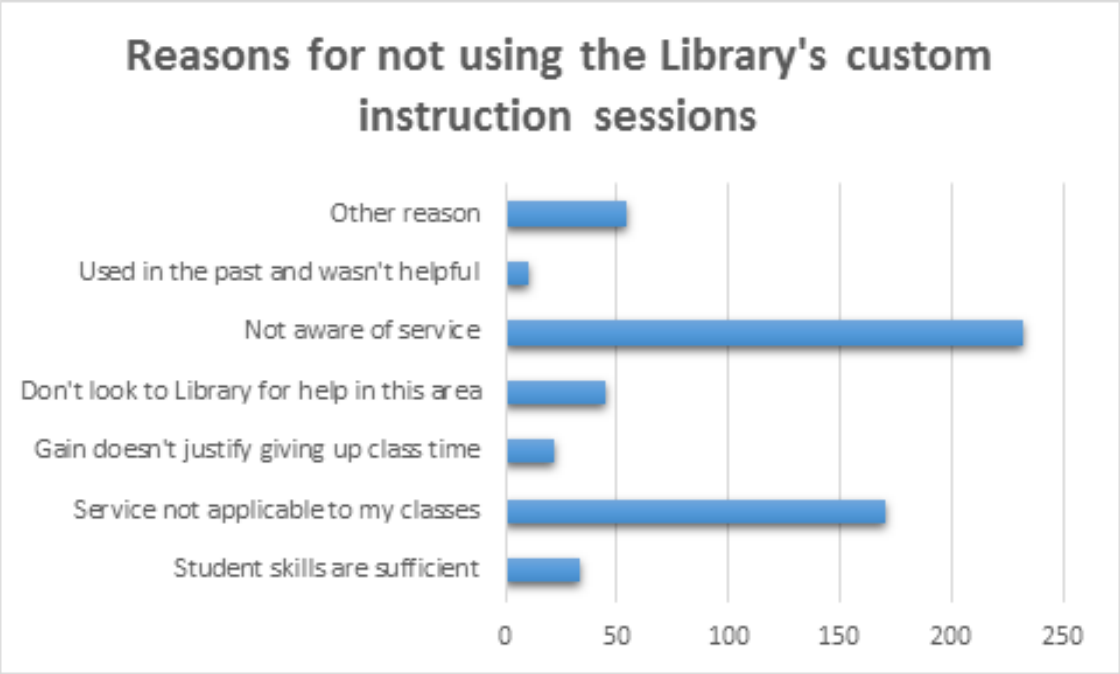
The next survey question asked about the use of library instruction sessions designed to help build these skills in students. Only 31% of respondents had used these services, while 69% had not. Of those who had worked with librarians in the classroom to build students' skills, 56% found that the sessions provided a great deal of help, 35% said they were a fair amount of help, and 9% found them to be of little help. Nobody responded that the sessions were not helpful. (Figure 2)

Figure 2: In 2014, Cornell faculty rated the helpfulness of library instruction sessions. No respondent chose the "were of no help" option.



The respondents who had not used library instruction were asked to identify all the relevant reasons why they had not made use of the service. Overall, the reason identified by most respondents, 41%, was lack of awareness of the service. In one school, this number was as high as 70%. The second reason, chosen by 30% of the faculty, was that these classes are not relevant to the specific classes taught. Eight percent do not look to the library for help in this area, 6% find student skills sufficient, 4% said the gain does not justify giving up class time, and 1% said they had tried using the service before but it was not helpful. Ten percent identified other reasons. (Figure 3)

Figure3: The most common reasons Cornell faculty did not use library instruction session in 2014 were lack of awareness and lack of applicability to their specific classes.

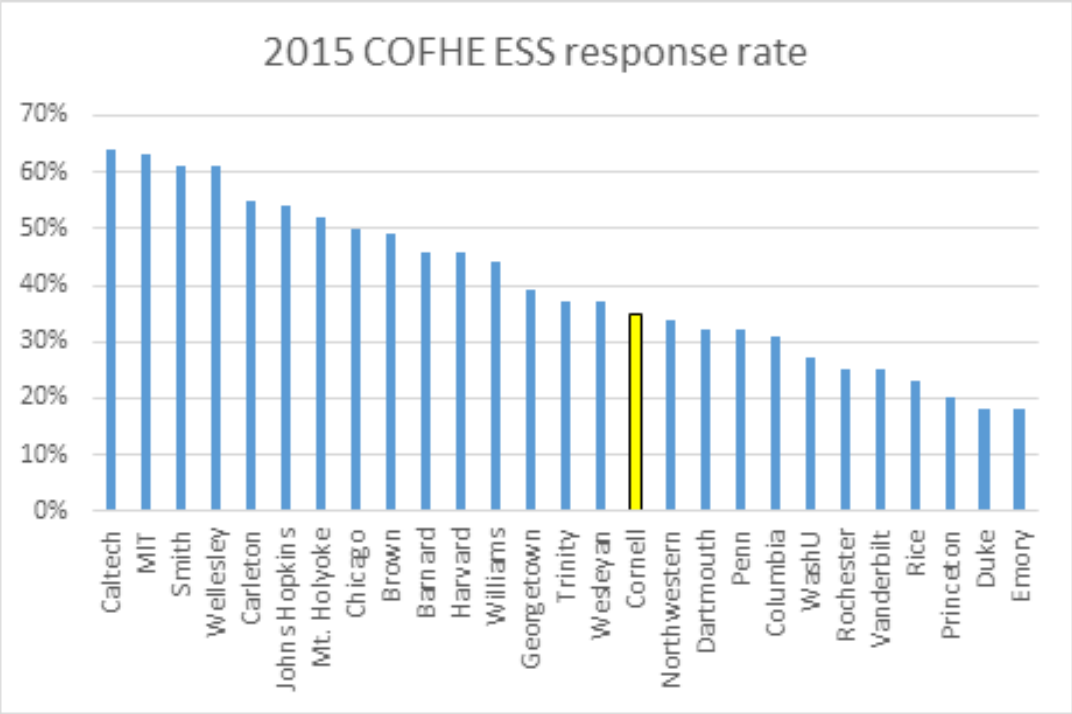


These survey results show that, overall, faculty see a need to improve information literacy skills in their undergraduates, that they find library instruction to be a helpful tool to build skills, and that the biggest obstacle to their using instruction is lack of awareness that it exists. By looking at this data by itself, we could conclude that, overall, our instruction program is quite successful; all we need to do is promote it more to those faculty who are not yet aware of its existence and value.

Many students do not find library instruction helpful

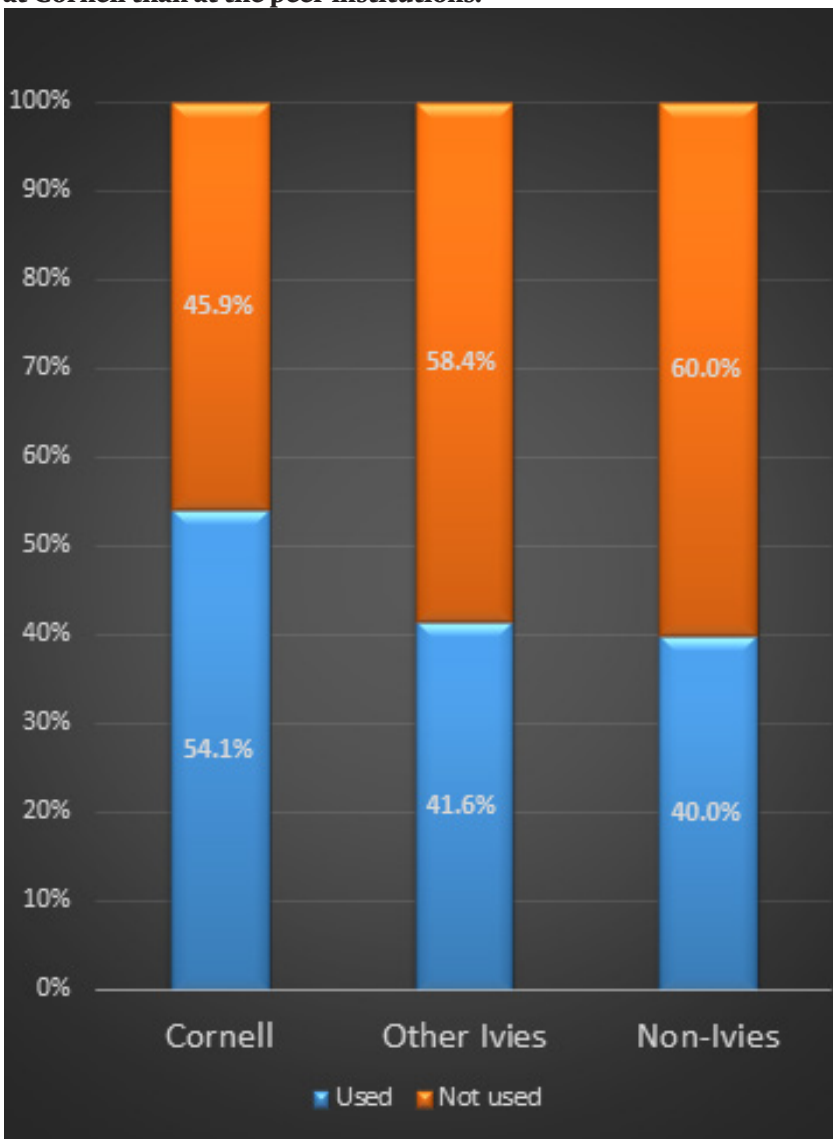
Faculty are obviously a major part of the educational equation, and so are students. Finding out how students feel about the helpfulness of library instruction was the next step in assessing the perception of the library instruction program by major stakeholders. Cornell identified the 2015 Consortium on Financing Higher Education (COFHE) Enrolled Student Survey (ESS) as a potentially useful vehicle to gauge undergraduate perception both at Cornell and at as many of the other COFHE schools as possible. With Cornell's leadership, a group of librarians from a handful of libraries approached COFHE and worked with them to formulate an optional panel of library-related questions that the participating universities and colleges could choose to add to the consortial core of the instrument. We also worked to alert the libraries at the COFHE institutions to the availability of this panel and encouraged them to talk to their institutional research offices if they wanted these questions asked. Out of the 34 universities and colleges that ran the survey that year, 29 (85%) ran questions from the new library module, and 27 (79%) chose formulations that were directly comparable. Figure 4 shows the participating institutions and their response rates.

Figure 4: Participating institutions and their response rates in the 2015 Consortium on Financing Higher Education (COFHE) Enrolled Student Survey ESS—universities and colleges that included the same question about the helpfulness of library instruction.



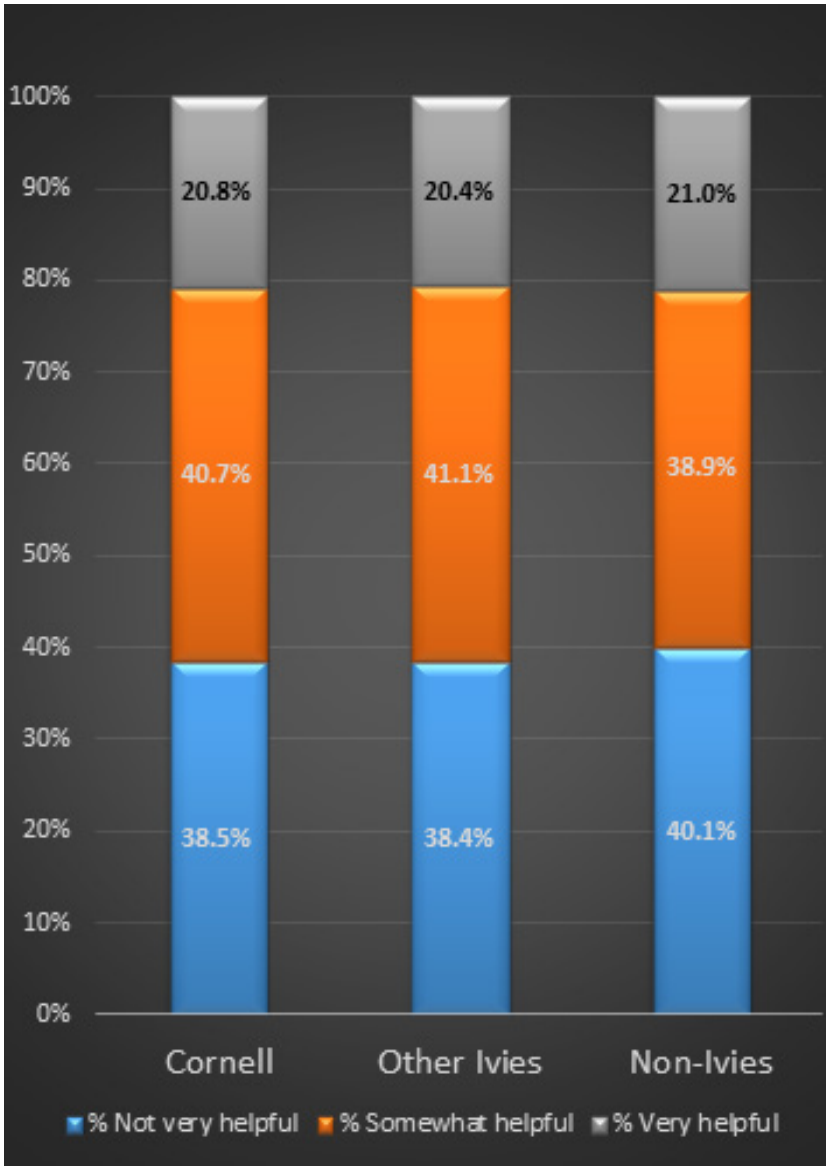
The survey question relevant to instruction was: During the current academic year, how helpful have library classes and presentations been to you? The possible answers were: not very helpful, somewhat helpful, very helpful, and didn't use. At Cornell, 54% of respondents reported having used library classes and presentations in the current academic year. This proportion was somewhat lower at the peer institutions: 42% at the other Ivy League institutions and 40% at the non-Ivies (the two normative categories that COFHE provided for our benchmarking analysis). (Figure 5)

Figure 5: The 2015 COFHE ESS survey shows a slightly higher rate of library instruction participation at Cornell than at the peer institutions.



While there were some differences between Cornell and the normative peer groups in rate of use, the perceived level of helpfulness of the classes and presentations was quite uniform: an astonishingly high 38–40% found them not very helpful, 39–41% rated them somewhat helpful, and only 20–21% said they were very helpful (Figure 6). The remarkable similarity of these results across the normative groups seems to indicate that these findings are valid for the current state of library instruction without major institutional differences.

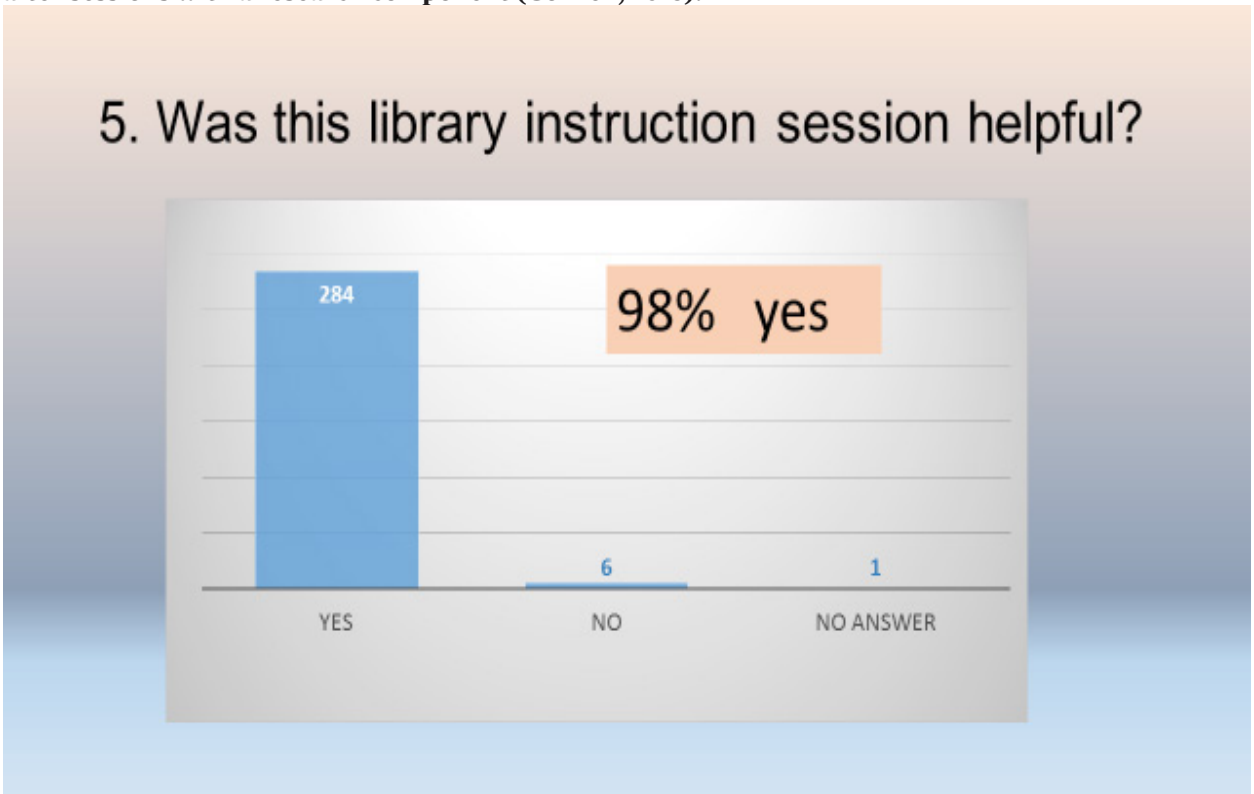
Figure 6: Students' perceptions of library instruction's helpfulness are shown to be uniformly low in the 2015 COFHE ESS.



These disappointing results came as a stark contrast to the positive view of the faculty. These results were also very different from numerous satisfaction surveys that we had conducted immediately following instruction sessions with the respective participants. For instance, a specially convened assessment task force worked on an instrument in the fall 2015 semester and recruited volunteer library instructors teaching classes with a specially designed research assignment to administer the survey at the end of their classes. Please note that only classes with research assignments were assessed, since one possible explanation of why the COFHE results were so disappointing was the fact that students were remembering various tours, general workshops, or general introductory sessions when they were rating the helpfulness of their overall experience. Whether this assumption is correct or not is immaterial since, with the 2015 assessment study, we wanted to test the hypothesis that the presence of research assignments in the class increases the (perceived) helpfulness of library instruction sessions.

There were 291 students who took the post-session survey and 98% of them rated the instruction as helpful (Figure 7):

Figure 7: Student perception of the helpfulness of library instruction sessions measured immediately after sessions with a research component (Cornell, 2015).



Student focus group shows issues with scaffolding

Even though the hypothesis of "presence of research assignment results in higher levels of satisfaction" might appear to have been confirmed by the results above, there still remained untested variables. Does time influence the memory of library instruction negatively? Does the presence of the instructor while the survey is administered impact students' perception of its helpfulness in a positive way?

In order to understand better what might be behind the contradictory results, we decided to use a self-selected student group, the standing Student Library Advisory Council (SLAC) and discuss the results with them. The students on SLAC are representative of the student population at Cornell in the sense that each college or school dean nominates two representatives to serve on the council. However, they are not a representative sample in that they have been nominated precisely because they are invested in the library and its engagement with the academic enterprise in one way or another. Their investment in the success of the library, as well as the fact that we already had experience working with the group (the university librarian and the associate university librarian for research and learning services meet with the group monthly) and were familiar with how vocal and frank with their concerns they could be, suggested to us that we would get useful feedback.

We presented the results of the faculty and student surveys and asked the members of SLAC to brainstorm reasons why such considerable differences in perceptions of helpfulness and value existed, as well as suggest ideas of how library instruction might be improved.

The reasons proposed as an explanation of the low ratings library instruction received on the COFHE survey included:

- Library instruction is forced
- Many students have gone through library instruction in high school
- Instruction is redundant: during their Cornell years, students experience "effectively the same presentation" multiple times
- Quality of instruction varies (it is often not engaging enough; instructors just "throw tools at you")

- Conceptually, library instruction is often too centered on fairly intuitive search engines, or it is too general

Asked about possible explanations of why at the end of library instruction sessions 98% of the students rated them helpful, while on the end-of-year ESS survey 38.5% of those who participated in library instruction found it not very helpful, the students offered various explanations: students forget what they learned, at the end of the session they feel bad if they do not rate positively, on the COFHE survey they were rating library instruction in relation to their overall academic experience, etc. Ultimately, the agreement coalesced around the perception that library instruction is too tool-based and is not teaching critical thinking.

The suggestions for improving it included:
- Replace instruction sessions with one-on-one sessions
- Turn instruction into a Q&A session
- Divide classes into smaller groups so that individual questions can be addressed

All of the suggestions clearly connected to the flipped classroom model where the content (or part of it) is delivered online and face-to-face interaction is reserved for customized help.

Pilot project

In order to address some of the points made by the members of the Student Library Advisory Council, especially those about redundancy and "experiencing effectively the same presentation," we decided to create a pilot project that emphasized customization, the flipped classroom, and specific assignments.

When we discussed the findings about the library's instruction program with the director of teaching excellence at Cornell's College of Engineering, she proposed a collaboration with two of the engineering courses that she was helping to redesign at the time. Tying in with the flipped classroom concept employed in the course redesign, the library produced a number of short instructional videos, each to develop a specific skill. All of the videos were of the "how-to" type: how to find high-impact articles; how to find authoritative, scholarly articles; how to find phase diagrams; how to find high-quality videos of experiments, etc. These videos were then embedded in the Blackboard syllabus to accompany specific assignments needing such skills for a truly on-demand, just-in-time instruction experience, where students who already have the appropriate skills can easily skip the items they do not need. This partnership made even more sense because, among all the Cornell colleges, the engineering faculty's evaluation of the usefulness of library instruction was one of the least positive. The pilot project targeted two fall 2015 engineering courses and produced a total of eight videos by two subject librarians. The length of the videos was between two and eight minutes. Two different methods were used for presentation. One used a split-screen method that showed the librarian, subtitles, and screen capture of the information resources being discussed. The other used only the screen capture with narration and subtitles. All videos were entitled "Ask a Librarian," followed by the content of the video posed as a question. The reasoning behind this approach was also to use this opportunity to brand the library and show students the kind of research help they can expect to get from a librarian.

Project evaluation and conclusion

We evaluated the video project in various ways. An indication of usage was the number of times the videos had been accessed along with the average viewing length. The logs revealed that the videos were viewed 701 times excluding views by the instructors, with an average length of 1–3 minutes. Of the 701 views, 220 show no time for the duration watched, which we surmise means that someone clicked on the link and then immediately closed it. There were 481 views that recorded time watched, with various lengths from 1.2 seconds to the full length. We are still not sure what to count as legitimate "views."

To put the numbers in perspective, the overall number of the students enrolled in the classes was around 150. One class had 100, the other had 50 students. The number of unique users for each video varied between 89 and 100 for the larger class and 26 and 43 for the smaller class. The two videos that were available for both classes ("Getting Access to Library Resources" and "How Do I Find High-Quality Lab Videos?") were accessed by 74 and 43 unique users, respectively.

A mid-term survey was administered to the students enrolled. When asked if the videos helped them complete the assignments, 79% replied yes.

The free-text comments varied from positive to critical. An example of a positive comment is: "I think your presentation is very good—and that is part of why I like it so much. The other part is that many professors expect you to know how to do research often without really teaching you." The critical comments focused on the content, not the form: "I found it to be poor advice to stick to PubMed and Web of Science compared to Google Scholar. Their main criticisms of Google Scholar actually have solutions on the GS page, they just didn't go over that."

The librarians who produced the content and were featured in the videos received some unsolicited feedback, which was overwhelmingly positive, as this one illustrates:

> I just wanted to drop you a quick line and say that I found some of the Panopto videos that you made very useful and informative. I am in a class for [Prof. X] [who] gave us some links to specific ones.
>
> I think you've done a great job of explaining things clearly and that the video format is a good way to create a resource that can keep on working that you can send people to rather than only dealing with questions one on one. So I wanted to say, that I thought they were really well done, and then also ask you if there is a way to access all of the ones you have made?
>
> [Prof. X] gave us links through Blackboard to about 5–7 videos but I didn't know if there was some central hub where I could see all the ones that have been made?

Finally, we used the same group of Student Library Advisory Council members to show these assignment-specific videos, and two other library online modules created previously—one on general library research, one on business research. We asked the students to rate the videos and then discuss their ratings. The newly created engineering videos were the highest-ranked because they were specific and short. They were also clearly preferred because of the newer technology used, e.g., captions, the ability to speed up or slow down, etc.

Next steps

What are the data-driven decisions about library instruction that we have made based on the triangulation of data?

In the absence of a required information literacy course at Cornell, and considering the demands on librarians' time, both from instruction and from other priorities, as well as the sentiment expressed by students that they get "basically the same presentation" in different classes, we have decided to focus on quality over quantity.

This translates into several points. First and foremost, our instruction efforts should be focused on classes with research assignments or components, which means that one big portion of our engagement—the teaching of freshmen writing seminars—may very well have to be contracted. If the writing class has no genuine research assignment, and since 98% of the students who had library instruction in connection with a research assignment found it helpful, then we should not be spending precious energy and resources on general sessions for classes with no research component. Another way to look at it is that it is imperative for library instructors to work with faculty to have library instruction be an intrinsic part of their syllabi, rather than an add-on or filler. This may very well mean that we teach upper-level classes more often than we teach freshmen writing seminars, or that we flip the freshmen writing seminar classes into essentially an upper-level research class by working with the instructor to create a research assignment. Undoubtedly, our numbers will go down, both in terms of number of sessions and participants reached, but if that translates into better-quality library instruction that students perceive as helpful and valuable, our efforts would have been well spent.

Second, we are focusing on teaching critical thinking skills, not on tool demonstration and explanation. This is where the ACRL *Framework for Information Literacy* comes in—we are not teaching students how to complete a particular assignment, but educating them about research. For instance, as important as citation guides might be, there is hardly a student (or a faculty member, for that matter), who, upon reading a citation guide, would exclaim, "This totally changed the way I am thinking about my research topic." With the profound changes that affect higher education, research, and teaching in the digital environment, how-to information is easier to capture

and process digitally than the elusive "a-ha moment." The valuable face-to-face interactions should be reserved for the "a-ha moments."

In practice, this means that everything that is procedural or composed of how-to information should be transitioned to online videos/tutorials, and classroom time should be reserved for unique help. Classroom time could take the form of one-on-one consultations on specific research projects or answering questions in a small group. This could also mean that librarians meet only with students who come with questions that have not been answered by tutorials because they are unique to their projects.

Our first step towards flipping the classroom for library instruction has been the creation of an online learning task force. This group is charged with creating videos and increasing staff proficiency so that instructors can easily create short videos on their own following best practices of communication and branding. This will free up time for face-to-face interactions that tackle unique problems and teach students not how to do research, but what research is.

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Mary Ann Mavrinac, Vice Provost and Andrew H. and Janet Dayton Neilly Dean, River Campus Libraries, University of Rochester

Sarah Tudesco, Assessment Librarian, Yale University Library

Endnotes

1. The Association of College & Research Libraries (ACRL) defined information literacy as the ability to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" in: Association of College & Research Libraries, *Information Literacy Competency Standards for Higher Education* (Chicago: ACRL, 2000), http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/standards.pdf.

2. Martha Kyrillidou, Shaneka Morris, and Gary Roebuck, comps. and eds., "Personnel and Public Services: Summary Data," *ARL Statistics 2013–2014* (Washington, DC: Association of Research Libraries, 2015), http://publications.arl.org/ARL-Statistics-2013-2014/36.

3. ACRL, *Information Literacy Competency Standards*.

4. Association of College & Research Libraries, *Framework for Information Literacy for Higher Education* (Chicago: ACRL, 2015), http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/infolit/Framework_ILHE.pdf.

5. For a very useful summary, see Megan Oakleaf, "The Library's Contribution to Student Learning: Inspirations and Aspirations," *C&RL* 76, no. 3 (March 2015): 353–358, http://crl.acrl.org/content/76/3/353.full.pdf+html.

6. The survey instrument, summary, and full results can be found on the Cornell University Library Assessment & Communication website at https://ac.library.cornell.edu/data#FacSurvey.

Using Images to Understand Students' Approaches to the Research Process

Ann Medaille and Molly Beisler
University of Nevada, Reno, USA

Abstract

Using images in library research and assessment projects can provide a rich source of data for learning about user behavior. In this project, student-generated drawings were used both as independent objects of analysis and as an elicitation method during interviews. Two hundred twenty-two undergraduate students drew pictures of the steps they took when executing research assignments, and nine students were interviewed about their drawings. Findings revealed information about students' use of research sources, their patterns of help seeking behavior, and the affective dimensions of their approach to research assignments. Recommendations for using images in assessment projects are discussed.

Using Images to Understand Students' Approaches to the Research Process

Images provide a valuable method of collecting data for research and assessment. In designing projects, librarians can use pre-existing images, produce their own images, or have participants produce images. For participant-produced images, librarians may ask participants to take photographs or create videos of certain aspects of their environments, or they might ask participants to draw or assemble images that reflect their experiences or perceptions.[1] In this paper, we focus on the use of participant-produced images as a valuable tool for library research and assessment. We describe how we used participant-produced images in an assessment project that focused on understanding students' research processes, and we conclude with several recommendations for designing image-based assessment projects and for conducting image analysis.

Literature Review

The use of images in research and assessment allows participants to express ideas or feelings that might not have emerged through words alone. Sandra Weber describes how "images can be used to capture the ineffable, the hard-to-put-into-words... Images can be used to communicate more holistically, incorporating multiple layers, and evoking stories or questions."[2] The process of creating images encourages participants to be reflective about their experiences, to consider issues in a different light, or to engage in more abstract types of thinking.[3]

Images can be used either as standalone items for analysis, tools that facilitate the researcher's interactions with participants, or items of participant empowerment. A common research technique that uses images is *visual elicitation* or *photo elicitation*, in which either pre-existing or participant-produced images are used as interview prompts to encourage participants to share perspectives that they might not otherwise have thought to reveal.[4] Visual or photo elicitation may be used to prompt participants to discuss issues in different ways, to explore and reflect upon everyday events, to give them a more empowered role in the research process, or to facilitate closer collaboration between the researcher and participants.[5] Another common visual research technique, *photovoice* or *video diaries*, involves giving participants cameras and asking them to communicate their stories through the use of images. Their products may then be shared with the community and be used to promote social justice causes.[6] While these are two of the more commonly used types of visual research methods, researchers can ask participants to work with visuals in any number of different ways, such as drawing diagrams, timelines, or self-portraits; creating collages from a mix of visual materials; or creating products that combine image and text, such as memory books, graphic novels, or diary-photographs.[7]

When analyzed, images often allow researchers to understand participants' individual accounts of their experiences or to construct collective narratives.[8] In addition, images can be especially powerful research tools when used in combination with text, and in many cases, images cannot be fully understood if they are divorced from the context in which they were created.[9] However, images can also pose special

problems for researchers in terms of analysis. Weber explains that:

> Images are open to interrogation and interpretation, and there are so many questions to consider... What constitutes a valid interpretation of images? Is there such a thing? What is the role of social and cultural context to interpretation?... What kinds of stories can images tell?... What relationships are possible between images and word?[10]

Regarding image analysis of participant-produced images, researchers have a number of options. Images can be analyzed quantitatively by identifying different variables, counting the frequency with which certain items fall into different categories and making comparisons between frequencies.[11] Images can be analyzed qualitatively by exploring the meanings of what has been depicted, which is often done in relation to textual analysis.[12] Alternatively, researchers may use some combination of quantitative and qualitative analysis.

Use of visual research methods in library research has grown over the past decade. Several library studies that have used ethnographic research methods to explore student and faculty information behavior have incorporated a visual component into the process of data collection. In studies of students' study preferences and work practices conducted at the University of Rochester, Nancy Fried Foster and her colleagues used a number of unique methods that combined image and text. These methods included photo surveys, in which students were interviewed about photos they took that reflected their lives;[13] mapping diaries, in which students recorded their daily movements on a campus map and were interviewed about them;[14] student designs of library spaces, in which students drew pictures or created visualizations of their ideal library spaces using poster board, markers, pencils, and sticky notes;[15] and retrospective interviews, in which students "drew comic-strip pictures in a rough flow chart, while telling the story of their work on a recent research paper."[16] In subsequent ethnographic studies of student research practices conducted at universities in Illinois and California, researchers also used photo surveys (alternately called photo journals), mapping diaries, student designs of library spaces, retrospective interviews, and cognitive maps, in which students were asked to draw maps of the library from memory.[17] In all of these studies, images served either as an interview elicitation technique, objects of analysis, or both.

In library studies that employ visual research methods, images are most commonly used as interview elicitation techniques. For example, in a photo diary study conducted at the Massachusetts Institute of Technology, students took photos and screenshots of their information-seeking activities and then discussed their images during interviews.[18] Other photo elicitation studies have been used to inform the redesign of library study spaces[19] and to study user perceptions of public library spaces,[20] Native American students' perceptions of academic library spaces,[21] the reading habits of undergraduate students,[22] and the information and library needs of music and dance students.[23]

Method

The goal of this project, a collaboration between two librarians and the director of a university writing center, was to learn more about students' research and writing processes by using drawings as the primary research instrument. The researchers asked 222 students in eight different classes that covered a variety of levels and disciplines to think about a recent research assignment and to draw all the steps they went through from the time that they received the assignment to the time that they handed in their work. The students were told that they could use text, pictures, numbers, or any combination thereof. They were also given two optional written questions to answer:

1. Which step in the process was the most challenging? (105 responses)
2. What would have made the process easier? (123 responses)

As part of the drawing activity, students were asked to supply their names and e-mail addresses if they would be willing to be interviewed about their processes. The researchers conducted interviews with nine students from a variety of majors, using the students' drawings to elicit more detailed information about what the students did throughout their research and writing processes, and about why they made the choices they did. The students were also asked some set questions about which parts of the process were most challenging, how much time they devoted to different parts of the research and writing process, what kinds of research sources they used, and how and when they sought help. The

interviews lasted 25–50 minutes, and were audio-recorded and transcribed.

After data gathering was complete, the researchers developed unique coding schemes for the drawings, written questions, and interviews. Coding the drawings posed some challenges, due to the mix of visual and textual content and the need to decide how to handle imprecision. Is a stick-figure person a friend? An instructor? A librarian? Does an unlabeled drawing of a computer represent research, writing, or procrastinating online? The researchers devoted much time to the development of a coding scheme and went through several rounds of testing to make sure all coders were applying the scheme consistently. The final coding scheme included examples from the drawings to clarify what was meant by different categories. For example, the category "get frustrated" could be illustrated by expressions of panic or stress, frustrated symbols that may seem similar to profanity representations, eyes drawn as X's, or exclamation points over clock or head. The written questions were coded separately with several categories and analyzed for general trends. The interview transcripts were examined for recurring themes, categories were derived from the themes, and the researchers coded each interview accordingly.

Results and Discussion

Research

Students depicted research in various ways. The most common were through computers (sometimes labeled with specific websites or library resources), books, or piles of papers representing articles. Most students depicted some kind of research, as shown in Table 1. It is interesting to note that 11% of the students did *not* depict any research, even though the task was to draw their process for "a paper that you recently completed that required research." It is hard to know whether these students actually do turn in papers for which they have done no research or whether this part of the process did not stand out in their memories of their work.

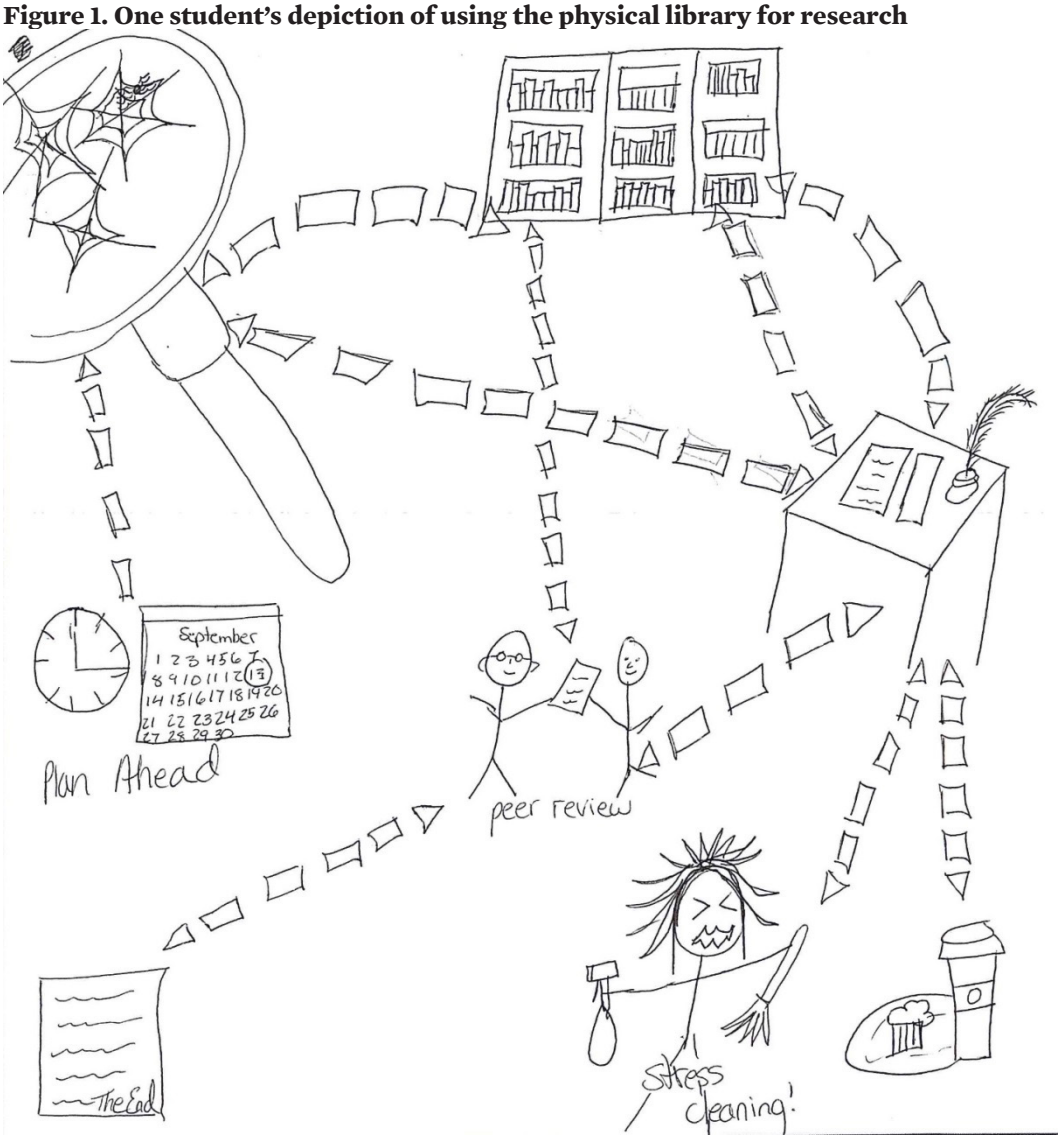
Table 1. Depiction of Research in Drawings (n=222)

Depiction	Number	% of Overall Respondents
Any type of research	198	89%
General research (books, computers, search representations)	142	64%
Preliminary research (before finalizing topic for paper)	83	37%
Google	50	23%
Physical library (books or physical spaces)	49	22%
Articles or journals	32	14%
Library website	25	11%
Specific library databases	20	9%

Note: Some students represented research in multiple different ways.

Eighty students represented using specific library resources—databases such as JSTOR, journals, the library website—and/or the physical library; 53 represented library resources but *not* the physical library (see Figure 1 for a common representation of the physical library). This was encouraging for librarians. While, of course, it would have been nice to see higher numbers, the fact that quite a few students voluntarily included information about use of specific resources indicated that at least some students are learning the value of library research sources as they are moving through their coursework.

Figure 1. One student's depiction of using the physical library for research



From the drawings, we saw how students viewed (or chose to depict) research as part of their processes. These depictions of research were also very useful prompts in the interviews for getting students to talk in greater detail about what they were doing. For example, one theme that emerged multiple times in the interviews was that students were having difficulty selecting a topic and finding appropriate sources about their chosen topic. Interviewee 4 talked about this: "It was a very open topic, where we could write pretty much whatever we wanted to, so first figuring out what I wanted to write about and then finding sources that helped to support what I wanted to write about was difficult." The connection between choosing a topic and finding sources is something that emerged only superficially in the drawings but the connection became clearer when students described these parts of their drawings in the interviews.

Help Seeking

Eighty students (36%) depicted getting some form of help in their drawings. Students depicted assistance either in some general fashion or specified the sources from which they received help as either peers, family members, the writing center, their instructors, or the library (see Table 2; see Figure 2 for an example of getting help from multiple sources). The most common source of help was peers or family members, with 47 students including this in their drawings, while the least common source of help was the library, with only two students depicting this. In addition to counting the number and types of help-seeking depictions, we analyzed

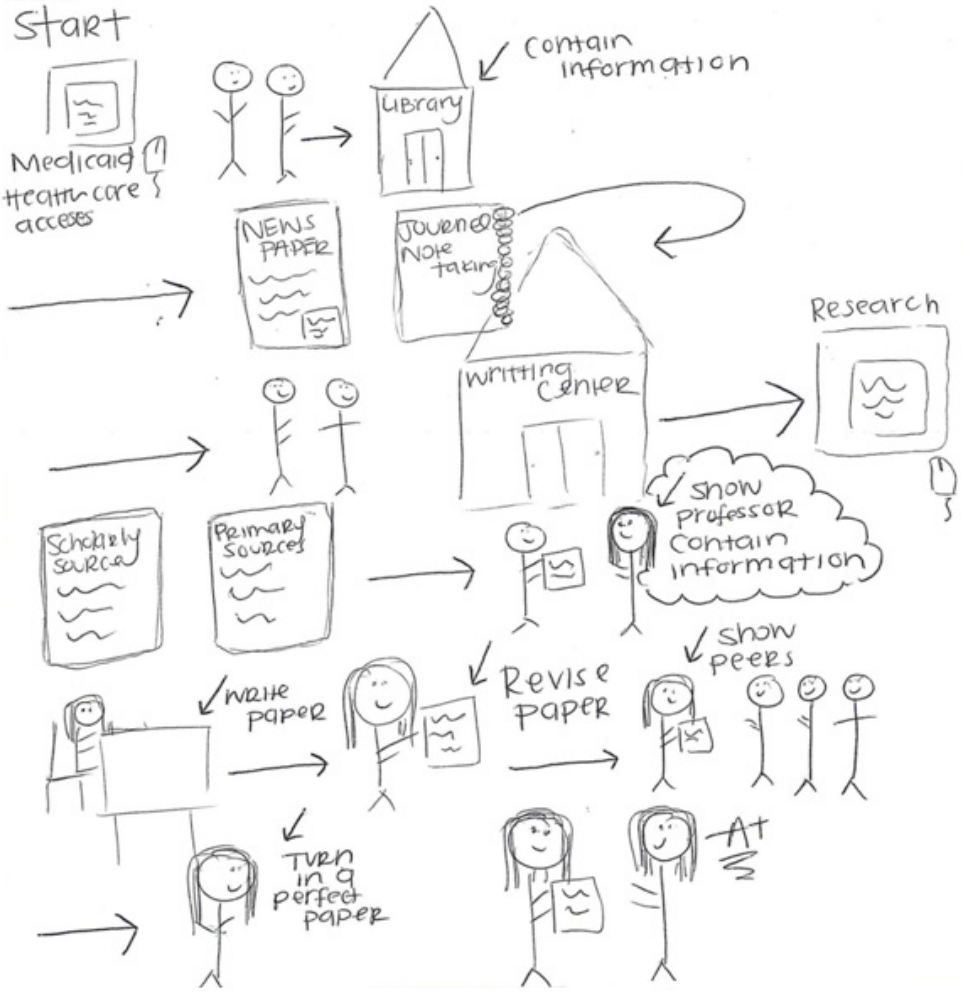
where those depictions occurred in relation to other elements. Students most commonly depicted getting help after they had already begun drafting their papers (67) versus before they had begun drafting their papers (30). Thus, for over a third of students, the process of getting help was important enough to depict visually, but help was usually sought toward the end of the process and usually from informal (peers and family members) rather than formal sources (writing centers, libraries, and instructors).

Table 2. Sources of Help in Drawings (n = 80)

Source	Number	% of Those Representing Getting Help	% of Overall Respondents
Peers or family	47	59%	21%
Unspecified	23	29%	10%
Writing center	19	24%	9%
Instructor	18	23%	8%
Library	2	3%	1%

Note. Some students represented getting help from multiple sources.

Figure 2. One student's depiction of getting help from multiple sources



Examining correlations between help seeking and other elements depicted in the drawings, we found that students who sought help generally showed better study, research, and writing habits:

- All students who depicted getting help from instructors (18) or the writing center (19) showed doing some kind of research.
- Those who depicted getting help from any source (80) were more likely to show better research habits (using specific databases or academic journals) and better writing habits (citing sources, using outlines, brainstorming before writing).
- Those who did *not* depict getting help from any source (142) were more than four times as likely to show procrastination in their drawings.

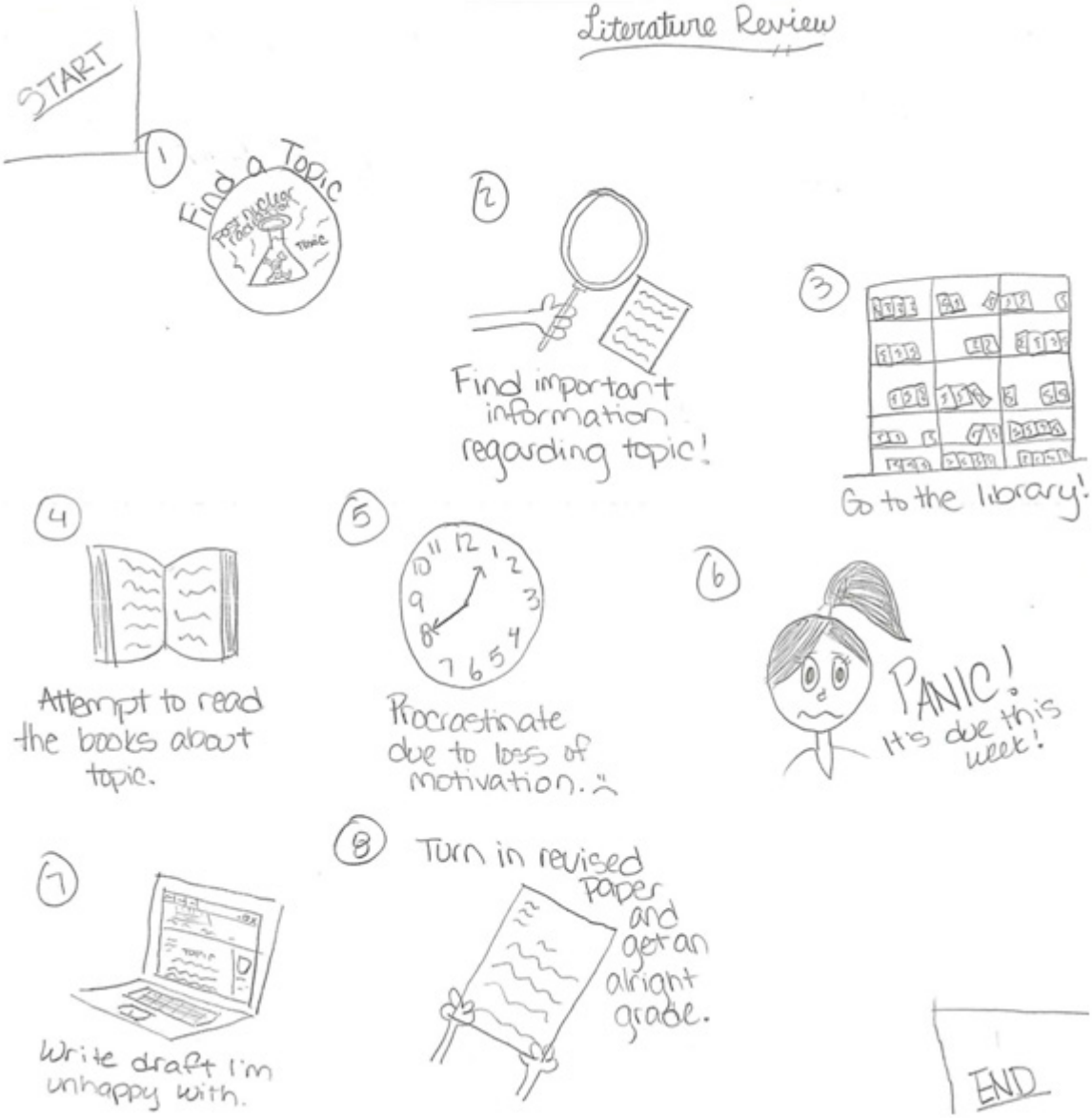
From the degree to which getting help seems to be connected to other positive habits, we concluded that getting help could be seen as a good research and writing habit in and of itself. It is impossible to know, however, whether those who seek help do so because they are more conscientious or dedicated students to begin with, or whether getting help fosters better research and writing habits.

Interviews provided further clarification of students' help seeking behaviors. Although only five interviewees depicted getting help in their drawings, all nine acknowledged getting some form of help upon further probing. This caused us to wonder whether help seeking is a much more common behavior for research assignments than was revealed in the drawings, even if some students do not recognize it as essential enough to warrant a visual depiction. In addition, the most common type of help that interviewees described receiving was for editing, which is consistent with our finding from the drawings that many students received help after they had already begun drafting their papers. Interviewees also described the help they received from peers and family members in terms of varying levels of quality, ranging from in-depth feedback to more superficial types of suggestions. Finally, when we looked at students' responses to our written questions, we found that students struggled in a number of different areas. In particular, 36% of students wrote that some improvement in research skills would have helped them do better on their assignments. Thus, many students need help with some of the more complex tasks associated with research assignments, but they are usually getting help after these tasks have already been completed.[24]

Procrastination, Frustration, and Taking Breaks

In drawing their processes of executing research assignments, students frequently included elements that were unrelated to the processes of planning, researching, writing, or editing (see Figure 3). For example, 29 students (13%) represented procrastination, which was often depicted as different types of distractions such as social media or other unrelated activities. Thirty-two students (14%) depicted getting frustrated, which was often depicted as panic or exclamation points over clocks or heads. Another 43 students (19%) depicted taking one or more breaks during the course of completing their assignments, which was often depicted as sleeping, eating, or representations of time elapsing such as clocks. The prominence of these elements in the drawings indicates that, for many students, executing research assignments is stressful and emotionally taxing. As librarians, we speculated that the drawing process enabled students to express these non-task-related elements in ways that they might not have done through other methods such as surveys or written responses.

Figure 3. One student's depiction of procrastination and panic



In the interviews, we asked students who had drawn these emotional or non-cognitive elements to elaborate more about them. Many of their responses indicated that they lacked confidence in their abilities or felt overwhelmed by such big assignments. For example, Interviewee #4 explained that "Once it starts getting closer, about two weeks before, I start really freaking out about it. I have anxiety problems." The students we talked to described a variety of ways that they managed their feelings and completed their work. Interviewee #7 explained how taking breaks was an important part of keeping his stress levels in check: "I'll start going in depth over my research. And then I'll kind of sit back and relax for a little bit because if I get too stressed, I tend to seize up really quickly. So I'm very good at keeping my stress levels down." Overall, these drawings and students' descriptions of them indicate that many had difficulty managing their time and stress levels when it came to working on research assignments. It also suggests that many students simply do not enjoy working on these types of assignments. Instructors and librarians can work together to address the affective elements that play such a large role in the way that students approach research assignments.

Recommendations for Using Images in Assessment

While images can be powerful research and assessment tools, they pose a number of challenges that have to be considered from the beginning of a project's design. When having students create images, your prompts need to be carefully constructed and tested with students. For our project, we initially began with just the drawing activity, but after trying it in two classes and looking at the results, we realized that it would be helpful to include a couple of brief written questions that asked students which part of the process was the most challenging and what might have made the process easier. We ended up getting very interesting supplementary information from those questions. As you consider adding more pieces to your data gathering, be sure to consider the additional time that will be required to both develop and test the different pieces.

Consider the instructions that you will give to students creating images. Despite having a script that was to be used to present the drawing activity, we soon discovered that it proved to be too easy for us to lead students toward either more text or more pictures simply by how we explained the activity, and so we had to make sure that we were consistent in giving instructions. Researchers should decide ahead of time whether or not showing students a sample drawing is advisable; if a sample is to be given, all students should see the same thing.

When designing your consent forms, make sure you get permission for any anticipated uses you foresee for the images or photographs you gather. Photographs require some special consideration. If participants are taking photographs, you may have to establish some guidelines about taking photographs of other people. Even if permission has been obtained, certain types of images do not protect anonymity—an issue of particular concern with using photographs—so you need to be clear about whether or not people should be in photographs and how you will use them if gathered.

When developing a coding scheme for analyzing drawings, considerable preparation needs to go into the creation of a method that encompasses all variations of how a certain concept may appear. If you are using a combination of image and textual data sources, you will need to decide whether to analyze images and text separately or together.[25] In the case of our project, we analyzed the images and textual data separately, and then compared them at the end for our final analysis. In addition, researchers need to recognize the limits of images as research objects and be wary of reading too much in to an image, when a particular interpretation is not warranted.

When designing a collaborative project, you have the opportunity to bring together different perspectives that may offer a more in-depth view of your research question. But be prepared for the fact that you will need to analyze and code data from those different perspectives, too. These different perspectives give you more information but will require more time and discussion, and perhaps more work in achieving inter-rater reliability since individuals may perceive things differently or even use different terminology. If drawings or other images will be coded separately by multiple researchers, a considerable amount of time should be spent on practice images to ensure that all participants are coding items consistently. Despite the added time needed for collaborative image projects, having multiple researchers can be beneficial in providing checks to ensure that images are being interpreted as consistently and accurately as possible.

When using images as elicitation objects in interviews, consider how you will question students about them. You can choose to have students discuss parts of an image separately or ask them to discuss images as a whole. When using a collection of photos, you can have students discuss them one by one. If you are doing audio recordings of your interviews, you may need to indicate aurally which part of the image or which photograph you are looking at if you plan to do transcriptions for further analysis.[26]

Conclusion

While using images in library research and assessment projects poses a number of challenges related to data collection and analysis, they can provide a rich source of data for learning about user perspectives. In this study, we used student-generated drawings both as independent objects of analysis and as a method for interview elicitation. In so doing, we learned much about students' use of research sources, their patterns of help-seeking behavior, and the affective dimensions of their approach to research assignments. This information has prompted a number of different strategies that

we are using or exploring in our library to better assist students with their research assignments.

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Take Back the Data

Lisa R. Horowitz
Massachusetts Institute of Technology, USA

Kirsten Kinsley
Florida State University, USA

Abstract

What data, facts, and figures tell the story of the 21st-century library? Do the statistics that we collect regularly reflect what we do now? In some ways, librarians have become slaves to our own data collection practices. When we continue to faithfully, unquestioningly collect figures that held meaning in the 20th century, we fail to paint the picture of today's transformational library. Cutting-edge technology, open-access efforts, and digital scholarship initiatives are not represented adequately in our current metrics that still include numbers of books, circulations, and reference transactions.

This study tries to advocate for data collection that tells the complex story of the 21st-century library. It uses prioritization of meaningful metrics based on the full scope of what we do in academic libraries. We hope the results engage readers in a deeper dialogue about how to prioritize library metrics, the issues involved in gathering some of these, and how to move forward with this research. Through this process, we are hoping to develop advocacy in librarianship to use data more strategically and tell a new story more reflective of the 21st-century library.

Introduction

For years, academic libraries have been asked to supply to accreditation and other agencies a variety of data to help determine their rank, status, or prestige, to justify funding, or to illustrate their accountability. The nature of these metrics is such that, over time, these facts and figures that are still collected no longer describe the academic libraries of today. The study was formulated to uncover how academic librarians would describe a 21st-century library to their stakeholders and users via appropriate metrics. Our hypothesis is that academic librarians will rank trends that demonstrate the value of the 21st-century library higher than traditional metrics that are requested by agencies today.

As we examined the metrics gathered by IPEDS, ACRL, and ARL, we saw that those instruments measure things that are generally used more by stakeholders (e.g., those who determine library funding, such as university and library administrators and trustees) than by users. Our users (e.g., faculty and students), who would see library metrics called out in marketing and promotional materials more than anywhere else, were less likely to be convinced of the value of our libraries through the kinds of metrics that mattered to our stakeholders. We therefore set out to ask librarians and administrators to identify a different kind of metrics.

For a presentation for the 2015 Southeastern Library Assessment Conference,[1] we gathered a list of "meaningful metrics" through an open solicitation to the LLAMA[2] MAES[3] e-mail list. This list of metrics and what we studied and presented at that conference became a starting point for our advocating for new metrics. For this study, we hoped to push the questions further.

Methodology

In order to minimize item selection bias by creating a list of metrics based on researchers' own interest areas and experiences, we consulted the following outside sources to generate a broad spectrum of current trends in academic libraries:

- ACRL Research Planning and Review Committee's Top Trends in Academic Libraries: A Review of the trends and issues affecting academic libraries in higher education (June 2014 and 2016)[4]
- The 21st-century library blog[5]
- ALA's American Libraries for the 21st Century[6]
- ALA's Center for the Future of Libraries[7]
- Librarian-solicited suggestions that led to our previously mentioned presentation

We generated a list of potential metrics based on these trends, and used a survey tool to rank preferred metrics. The first three questions were grouped by category: resources (e.g., collections, expenses, memberships), services (e.g., instruction, consultations, projects, special services), and access and space-related services (e.g., 24/7 availability, makerspaces, reservable classrooms). Within each question, respondents were asked which metrics would best represent the 21st-century library when presented to stakeholders and users. Stakeholders were defined as university and library administrators, trustees, etc., while users were qualified as faculty and students. By defining metrics in these two ways, we hoped to distinguish what is meaningful when trying to show accountability for expenses or justify new resources, as opposed to when trying to market an academic library.

These first questions provided metrics that are already known to be quantifiable and measurable, generally input and output measures. Library research, however, has indicated the importance of outcomes measures for indicating value to stakeholders. With this in mind, the next question asked respondents to rank a variety of correlations between something the library does with something that shows student or faculty success. A final question asked respondents to add their own thoughts about trends in libraries in the 21st century and the metrics that illustrate them. Respondents were also asked to share any thoughts about metrics or the survey itself.

There were a number of limitations to the survey questions, as well as the survey tool. We included some of the inputs and outputs asked by ARL and IPEDS and others because we believed these would be expected, although we did hope that librarians would not prioritize these basic counts as indicators of a 21st-century library. Most of the metrics that were used in the survey are quantitative, but these do not tell the full story of what libraries do for users and stakeholders. Qualitative metrics are noticeably missing, and would add an important aspect to any future study.

The Results

Two hundred seventeen people opened the survey link. However, more than half of these responses were blank. We believe that this is due in part to the complexity of the survey itself, but also because the tool itself was difficult to use and did not work well across all devices. The number of effective respondents (any participant that responded to at least one question on the survey) was 99. The respondent pool is obviously self-selected, and the only demographic gathered was job title, so there is no indication about the diversity of the sample in any other characteristics.

Each participant could rank multiple items for each question, with 1 being the highest rank. Our ranking algorithm used only the top 5 ranked items in analysis. Items for each question were weighted according to the rank allotted (5 points for Ranking 1, 4 points for 2, and so on, with 0 points for any rank above 5). A sum of the points for each item led to a score for each item. Those with the highest scores were considered the most important to the respondents as a whole.

Figure 1: What metrics would best represent the 21st-century library's resources?

Stakeholders	Users
Extent of collection use	Collection breadth (extent of subject coverage)
Library expenditures per student FTE	Number of electronic journals
Collection breadth (extent of subject coverage)	Collection depth (number of titles in the collection)
Consortial memberships, which offer access to additional materials	Accessibility of special, rare or archival materials
Availability of repository services to store digital materials and/or data over time	Library expenditures per student FTE

The responses to our question about resources demonstrate that librarians expect stakeholders to be interested in what our metrics have measured for years: how extensive the collection is and much it is used, and how much we spend on students. But librarians also want to flaunt some innovative practices: membership in consortia, with its access beyond the collections available on a single campus, is understood to have a meaningful value to the campus.[8] And 21st-century library stakeholders, it is anticipated, care about sustainability over time, thus the importance of repository services. With the ephemeral nature of digital materials, we need to be able to maintain access to them across time.

For users, our respondents continue to feel that what matters is the size and breadth of the collection, including how many e-journals libraries have. In an interesting twist, many respondents indicate that special, rare, and archival materials matter in a way that has not been measured in the past. As libraries' collections are less and less different from each other, it will be the special collections that will differentiate libraries. Note that ARL has begun to collect information about special collections for this purpose.

Several other write-in responses are particularly worth noting:

- *Culturally diverse, skilled info professionals:* The importance and value of expert staff cannot be argued, and finding a metric to indicate that could be fruitful. (Ideas that have been raised include percentage of library staff with PhDs or graduate degrees, numbers of publications written by library staff.) However, the idea of highlighting a culturally diverse workforce is an excellent addition to the possible metrics that would matter to our users. In a world where people of color, those with disabilities, and those who identify themselves as transgender are looking to see themselves in the library, what better way to show them than by a metric that quantifies our staff according to our user populations?
- *Fundraising success:* This was a write-in that seems obvious, and yet had not been raised in our work previously. A metric of successful fundraising would certainly be of importance to stakeholders.

Figure 2: What metrics would best represent the 21st-century library's services?

Stakeholders	Users
Number of individual reference/research transactions or consultations	Availability of caffeine and food at all hours
Number of instruction sessions [one-shot or embedded library instruction (in-person or online)]	Access to unique or expensive hardware or software
Altmetrics used to demonstrate impact of scholarship	Number of individual reference/research transactions and/or consultations
Access to unique or expensive hardware or software	Number of instruction sessions [one-shot or embedded library instruction (in-person or online)]
Number of outreach services for unique user groups	Number for equipment checkout: laptops, cameras, chargers, etc.

In the responses regarding services, it is more obvious that librarians understand students' financial struggles. Two of the top five metrics for users are for services that alleviate financial pressures on our user communities,[9] through offering of unique or expensive hardware and software, as well as by loaning equipment such as laptops and cameras. The top choice of metric for users was, unsurprisingly, the availability of food and coffee in or near the library.

Librarian participants clearly still feel that the human element—library staff offering reference, research consultations, and instruction—play a primary role in the 21st-century academic library for both stakeholders and users, and metrics that quantify that value through counts of transactions were high on both lists. For stakeholders, participants also indicated that the number of outreach services for unique user groups, another human-mediated service, was one of the most important metrics. These quantitative measures, though, do not capture the actual importance of human interaction. The *qualitative* value of these stories is more likely to be in people's relationships and interactions and results, rather than in how many transactions librarians have.

As mentioned previously, this survey included fewer outcomes measures as options than we would have liked. It is therefore perhaps unsurprising that one of the ways to measure impact that we included—altmetrics—was an appealing option for illustrating to stakeholders how libraries might demonstrate the impact of scholarship.

Two write-in options made *time* into metrics: amount of time spent with students and estimate of time saved by users. The former could certainly indicate the value placed by participants on the human element in the library, as well as the expertise available there. One caveat often raised about time, however, is that spending more time does not necessarily mean that better service was provided, so a metric of that sort would have to be combined with others (student success factors perhaps?) to indicate that the time was well spent. The latter option was described in more depth as, "Estimate of users' time saved (or time value) based on READ scale distribution of reference/research transactions and consultations, by user group." The idea of finding a way to measure time saved, perhaps in conjunction with how much time library staff spent, seems like it might be particularly impactful on students.

One additional write-in was about library staff: library participation in academic activities such as course instruction or curriculum planning. This metric would mean a lot to library staff, as it would show that the universities value what the library offers its students. If there are stakeholders unaware of this participation, that metric would be a powerful indicator of the libraries' value in the academic environment at that institution.

Figure 3: What metrics would best represent the 21st-century library's access and space-related services?

Stakeholders	Users
Number of hours open	A mix of quiet and collaborative spaces
Availability of 24/7 space	Availability of 24/7 space
Device-neutral digital environment (access to materials and/or databases/platform vendors no matter what device)	Number of hours open
Number of study rooms available for reserving	Number of study rooms available for reserving
Availability of a free and accessible makerspace for 3D printing, audio file generation, etc.	Easy access to the library (distance from parking lots, classrooms and residence halls)

The number of possible options for the question about access and space-related services was only 8 (compared to 17 and 13 for the previous two questions), so it is more likely that the choices for stakeholders and users would be more similar to each other. Even so, 24/7 space (or as one write-in indicated, 24/5 space) is a highly desirable element for an academic library in the 21st century, both for stakeholders and for users, according to our participants. Along the same lines, the number of open hours is highly important, as is the number of study rooms available for reservation. All of these

elements indicate that our physical spaces are available to be used in all kinds of ways.

For stakeholders, librarian respondents highlighted a device-neutral digital environment as a prioritized metric. There is no question that a library that makes it easy to use the multitude of devices that students have available to them provides a desirable service. The fifth choice to make an impression on stakeholders was the availability of a makerspace, which indicates the extent to which libraries offer what users need in innovative ways.

For users, the option that got the most support from respondents was a mix of quiet and collaborative spaces. Even in the 21st century, students still want spaces to study quietly, but in this new world, it is even more important to be able to study collaboratively without impacting those who wish to be quiet. Academic libraries that are renovating are finding ways to separate these kinds of spaces, so that it is clear where more noise is permissible. Respondents also recognize how important it is to users to be convenient, selecting easy access to the library as an important metric.

Write-in metrics for stakeholders suggest that the use of space for materials matters, with write-ins such as square feet of remote storage and updating of equipment. The extent of available public space, such as square feet per FTE of publicly-accessible space or square feet of quiet space, remains important even in the current century. One respondent also suggested that because our users are online, having some metric related to the library's web site would be valuable to stakeholders. One thing that we neglected in our set of options regarding space was any metric related to people in the library, so several write-ins mentioned gate counts, busiest times of day, and number of people in the library per hour. Respondents' write-ins for users were more related to the kinds of things that users look for in their spaces, e.g., comfortable furniture and cleanliness, but also noted the absence of a metric regarding people in the space.

As mentioned above, most of the options listed were library inputs and outputs. Because library research has stressed the importance of outcomes measures for indicating value to stakeholders, ten potential outcomes measures were offered based on a variety of studies. The following five got the most support:

Figure 4: Outcomes important to stakeholders

Information literacy and/or critical-thinking instruction with student GPA, retention, graduation rates, or higher GRE scores
Library expenditures per student FTE with retention and graduation rates
ARL statistics (e.g., number of professional library staff per student) with first-year retention rates and six-year graduation rates from IPEDS data
Library resource and space usage with student GPA, retention, or graduation rates
Library instruction with paper and course grades

These five were all related to student success: GPA, retention, and graduation rates. Items that reflected correlations between libraries and bigger picture outcomes such as national rankings (e.g., *US News & World Report* rankings) and statewide educational performance measures were ranked at the bottom of the list, although upon further consideration it should be noted that some statewide performance metrics may be broken down into metrics that measure similar outcomes such as student GPA, persistence, and graduation rates. Ranked last on the outcomes list was a general measure of the effects of library services, access and spaces, and resources on faculty productivity, which may be a measure more important at highly selective schools, where student success cannot be measured through traditional factors such as GPA, retention, and graduation rates.

The write-in options for this outcomes question incorporated the value of library staff (e.g., number of public service librarians per student FTE with first-year retention rates and six-year graduation rates) and value of library resources (e.g., use of library resources with student research success or faculty grant success). The first of these has been expressed in other write-ins. Librarians unsurprisingly are looking for concrete ways to acknowledge their contributions to success. The

latter item reveals another way to illustrate impact on faculty.

Figure 5: Additional 21st-century trends and metrics of interest

- Open access metrics
- Self-service options
- Access to digital materials
- Physical space usage
- Correlations with job placement, well-being
- Contributions to community engagement
- Cost-savings
- Staff participation and engagement in campus-wide committees

Finally, the survey included two open-ended questions. Respondents were invited to add any additional 21st-century trends and metrics that they had not indicated previously, and then to share any other thoughts about appropriate metrics for a 21st-century academic library. A number of gaps were noted. One respondent felt strongly that open access metrics were the future of libraries, saying, "I think one of the most important measures will be whether libraries can transition from a print collection to putting more money into supporting open access publishing. This will eventually lead to print collections no longer being a measure of importance."

Metrics about convenience and space were addressed in these additions. Access to digital materials (as evidenced through the percent of the online collection) and self-service options that offer the ability to use the library without being in it highlight the library's value regardless of location. At the same time, gate counts and occupancy rates can emphasize the importance, even in the 21st century, of the library as space. One respondent also wrote that, "as we transition from a print collection to opening more space, repurposing space will also be an issue and how libraries manage that transition will be an important measure."

Correlations of library usage with students' success factors beyond GPA and retention, such as job placement and general well-being, and indicators that acknowledge library contributions to community engagement, stress the library's value as a non-judgmental contributor to a student's college experience. Cost-savings through collaborative ventures and collections choices speak well to stakeholders, as does staff participation and engagement in campus-wide committees and other institutional structures.

There were a few write-in comments that pushed us beyond the survey in our thinking. One respondent critiqued our separation of metrics for stakeholders and users. Our thinking had been, as we explained above, that how we present ourselves to each of these communities is different, because of what librarians want from them. However, the participant pointed out "we still need to convince our University stakeholders that 24 hour coffee is a good investment of resources." Given that food and caffeine as a service was considered a highly important factor of value for users but not provided as an option for stakeholders, this point is well taken.

An important issue that we touched upon earlier is that the self-selected nature of the small pool of respondents, and the lack of demographic data about them, means that we do not have a good sample. Several respondents did comment on the lack of diversity even in the way the measures were written.

- "At my relatively small private non-profit academic university, focus is on two metrics: cost reductions and student retention. Metrics that demonstrate a correlation between the instruction and technology support provided by my team and student achievement or retention will have the greatest impact with funding stakeholders who continue to envision the main role of librarians to be checking books in and out."
- "In that we have a lot of non-traditional/ working adult students, we still find valuable the measurement of gate count and reserve textbook checkouts since this tells us if our population is (1) coming in at all and (2) using the thing that

is most often requested (textbooks). Metrics for our 21st-century academic libraries should be as meaningful and yet flexible as the libraries they will represent."
- "... we are a small liberal arts school and 24/7 or 24/5 space isn't something we have the capacity to offer... we also need to consider how smaller institutions can use these or similar metrics to remain competitive and/or talk to stakeholders about library value."

Coming back to the issue of the urgent need for outcomes measures and qualitative measures is summed up in these comments:
- "The value of a 21st Century Library has to be measured by the quality of those transactions, things, and interactions, as well as by the impact we have on our users. The 'Number of...' has never adequately demonstrated or measured our value to our communities. If we don't soon find ways to measure quality and outcomes, we're all in trouble."
- "I definitely think the traditional measures of collection size and professional employment percentages is [*sic*] not reflective of how we should be evaluating academic libraries going forward. The focus should be on evaluating academic success in connection with library resources and instruction, and data management and digital humanities projects better correspond with the needs of faculty going forward."
- "Replicatable [*sic*] models that show the impact of the library on student outcomes and success are essential going forward and this study suggests the importance of these. The difficulty will be developing and testing these models and showing their efficacy to the larger higher education community."

Impact of Job Roles

The one demographic we did gather was respondents' job titles. By gathering this, we could observe whether there were any differences between what library administrators, whom we would consider stakeholders, and librarians in non-administrative positions deem important metrics. If those two groups prioritized these metrics very differently, then it would be critical to address this discrepancy as we determine which metrics we collect as assessment librarians.

To get at this, after various combinations, we grouped titles such as dean, library director, associate dean, or associate director as "Administration" (n=18), and all other positions were considered "Other" (n=45; 32 librarians, 7 department chairs, 6 others). The latter set included department head, department chair, librarian, and other titles such as director of planning and branch operations, library manager corporate administration, professor, quality and planning manager, process improvement specialist, and student.

Rankings were done in the same way as above. We compared the top five items, but also looked more broadly at how the order of their priorities agreed. Overall, we found that, in most categories, there were no differences between what metrics administrators and non-librarian administrators thought were important to stakeholders and users. The most agreement was in metrics to describe resources to users, metrics to describe access and space-related services to stakeholders, and outcomes metrics to present to stakeholders. There were no striking discrepancies between what metrics administrators and non-administrative librarians value; therefore, librarian administrators as stakeholders, at least in this study, seem to agree with non-administrators about what metrics we should collect.

Next Steps

This survey focused on understanding what academic librarians want our communities and our stakeholders to know about the 21st-century library. The results can help us continue to advocate for more up-to-date and relevant measures for libraries in North America that are required to collect statistics normally requested annually by the Association of College and Research Libraries (ACRL), ARL (Association for Research Libraries), and IPEDS (Integrated Postsecondary Education Data System) Academic Libraries surveys. Smart metrics identified in the results could also be shared with stakeholders and users in marketing materials or in funding requests, accountability descriptions, and other places where the value of the 21st-century library has impact.

Beyond that, more research can be done where stakeholders and users inform what they want to understand about academic libraries, to complement what we need them to understand that they might not already know. We as the academic library community need to keep researching how to express

outcomes and qualitative measures in realistic and feasible ways that are possible and meaningful for all kinds of academic libraries, of all sizes, that serve all different kinds of communities. Further research should analyze the implications of different metrics over these different types of institutions, but should not settle for measures that are easier to count. We need to take back our data, and we need to make our case that the 21st-century library is not simply a place where "the main role of librarians [is to check] books in and out."

Acknowledgments

The authors would like to thank a few people who made a special effort to pre-test our survey: Zsuzsa Koltay, Christine Quirion, Renaine Julian, Alice Daugherty, Abby Scheel, and Karen Neurohr; and thank you to Kirsten's students, Andrea Dawson and Jean Mao, who helped to test the survey tool and run the analysis of the results. Finally, thank you to all of you who took the survey!

Notes

1. Lisa Horowitz, Kirsten Kinsley, Zoltan Szentkirályi, Zsuzsa Koltay, "Metrics with Meaning: How Can We Effect Change to Library Assessment Metrics used by Non-Library Organizations" (paper presented at the Southeastern Library Assessment Conference, Atlanta, Georgia, November 16–17, 2015), http://scholarworks.gsu.edu/southeasternlac/2015/track/5.

2. Library Leadership and Management Association, a division of the American Library Association.

3. Measurement, Assessment, and Evaluation Section, now called Assessment Section.

4. ACRL Research Planning and Review Committee, "Top Trends in Academic Libraries: A Review of the Trends and Issues Affecting Academic Libraries in Higher Education," *College & Research Libraries News* no. 75 (June 2014): 294–302; ACRL Research Planning and Review Committee, "2016 Top Trends in Academic Libraries: A Review of the Trends and Issues Affecting Academic Libraries in Higher Education," *College & Research Libraries News* no. 77 (June 2016): 274–281.

5. Kimberly Matthews, "Issues," *21st Century Library Blog,* https://21stcenturylibrary.com/issues/.

6. American Library Association. "America's Libraries for the 21st Century," http://www.ala.org/advocacy/pp/prog/century.

7. American Library Association, "Library of the Future: Center for the Future of Libraries," http://www.ala.org/transforminglibraries/future.

8. A write-in comment at the survey's end noted, "[we] need to emphasize quick availability of material, even material that we don't own but can obtain."

9. Malcolm Hadley's study indicates the importance of financial factors in users' choice of college. Malcolm Hadley, "Picking College, Major, Comes Down to Money," *USA Today*, August 15, 2013.

APPENDIX A

21st-Century Academic Library Metrics Survey

What data, facts and figures best tell the story of the 21st-Century Academic Library? For years, academic libraries have been asked to supply a variety of data to different sources to help determine their rank, status, or prestige, to justify funding, to illustrate their accountability, etc. However, these facts and figures do not necessarily tell the story of what a 21st-Century Academic Library is. This survey asks academic librarians to share their thoughts about what best represents a 21st-Century Academic Library. The topic lists come from various sources:

- Librarian solicited suggestions in 2015 on various listservs
- ACRL Research Planning and Review Committee's Top Trends in Academic Libraries: A Review of the trends and issues affecting academic libraries in higher education (June 2016 and June 2014)
- The 21st century library blog
- ALA's American Libraries for the 21st Century

The following questions ask you the rank the importance of various metrics that might represent the 21st-Century academic library. They are grouped in these three categories: resources, services, and access and space-related services. Please rank metrics according to their importance for these two different audiences: stakeholders (e.g., university and library administrators, trustees) AND users (e.g., faculty and students). This survey will take approximately 20 minutes of your time.

1a. Regarding metrics about resources (i.e., collections, data sets, etc.) as represented to stakeholders: Please select and rank these academic library resources that could be used to represent the 21st-Century Library to our stakeholders. Drag items up or down to number of rank desired, with one being the highest ranked item. Only the top 5 will be used in analysis.

- Accessibility on-site of special, rare or archival materials
- Availability of repository services to store digital materials and/or data over time
- Collection breadth (extent of subject coverage)
- Collection depth (number of titles in the collection)
- Commitment to preservation of print or tangible materials
- Consortial memberships, which offer access to additional materials
- Extent of collection use
- Library expenditures per student FTE
- Number of data sets
- Number of e-books
- Number of electronic journals
- Number of items locally digitized by the library
- Number of Open Education Resources available (textbooks, MOOCs)
- Percent of collection that can be browsed
- Percent of library's local proprietary materials and/or data that are open access
- Write in:
- Write in:

1b. Regarding metrics about resources as represented to users: Please select and rank these academic library resources that could be used to represent the 21st-Century Library to our users. Drag items up or down to number of rank desired, with one being the highest ranked item. Only the top 5 will be used in analysis.

- Accessibility on-site of special, rare or archival materials
- Availability of repository services to store digital materials and/or data over time

- Collection breadth (extent of subject coverage)
- Collection depth (number of titles in the collection)
- Commitment to preservation of print or tangible materials
- Consortial memberships, which offer access to additional materials
- Extent of collection use
- Library expenditures per student FTE
- Number of data sets
- Number of e-books
- Number of electronic journals
- Number of items locally digitized by the library
- Number of Open Education Resources available (textbooks, MOOCs)
- Percent of collection that can be browsed
- Percent of library's local proprietary materials and/or data that are open access
- Write in:
- Write in:

2a. Regarding metrics about services as represented to Stakeholders: Please select and rank these five academic library services that could be used to represent the 21st-Century Library to our stakeholders. Drag items up or down to number of rank desired, with one being the highest ranked item. Only the top 5 will be used in analysis.

- Access to unique or expensive hardware or software
- Altmetrics used to demonstrate impact of scholarship
- Number of consultations about data management and curation (discovery and use of data sets in the open domain); includes text-mining, data refining (Open-Refine).
- Number of digital humanities projects
- Number for equipment checkout: laptops, cameras, chargers, etc.
- Number of individual reference/research transactions and/or consultations
- Number of instruction sessions [one-shot or embedded library instruction (in-person or online)]
- Number of late night library tutoring sessions
- Number of outreach services for unique user groups
- Number of MOOCs by libraries
- Number of workshops on using library resources or digital tools
- Percent of budget spent to support scholarly communication (through open access publishing options, funding of author fees, etc.)
- Write in:
- Write in:

2b. Regarding metrics about services as represented to users: Please select and rank these academic library services and amenities that could be used to represent the 21st-Century Library to our users. Drag items up or down to number of rank desired, with one being the highest ranked item. Only the top 5 will be used in analysis.

- Availability of caffeine and food at all hours
- Access to unique or expensive hardware or software
- Altmetrics used to demonstrate impact of scholarship
- Number of consultations about data management and curation (discovery and use of data sets in the open domain); includes text-mining, data refining (Open-Refine).
- Number of digital humanities projects
- Number for equipment checkout: laptops, cameras, chargers, etc.
- Number of individual reference/research transactions and/or consultations
- Number of instruction sessions [one-shot or embedded library instruction (in-person or

online)]
- Number of late night library tutoring sessions
- Number of outreach services for unique user groups
- Number of MOOCs by libraries
- Number of workshops on using library resources or digital tools
- Percent of budget spent to support scholarly communication (through open access publishing options, funding of author fees, etc.)
- Write in:
- Write in:

3a. Regarding metrics about access and space-related services as represented to stakeholders: Please select and rank these academic library access and space-related services that could be used to represent the 21st-Century Library to our stakeholders. Drag items up or down to number of rank desired, with one being the highest ranked item. Only the top 5 will be used in analysis.
- Availability of 24/7 space
- Availability of a free and accessible makerspace for 3D Printing, audio file generation, etc.
- Device-neutral digital environment (access to materials and/or databases/platform vendors no matter what device)
- Number of classrooms available for reserving
- Number of hours open
- Number of study rooms available for reserving
- Spaces and/or services that support health and wellness (e.g., stress-busters during finals)
- Years since most recent renovation
- Write in:
- Write in:

3b. Regarding metrics about access and space-related services as represented to Users: Please select and rank these academic library access and space-related services that could be used to represent the 21st Century Library to our users. Drag items up or down to number of rank desired, with one being the highest ranked item. Only the top 5 will be used in analysis.
- A mix of quiet and collaborative spaces
- Easy access to the library (distance from parking lots, classrooms and residence halls)
- Obvious security measures in place (e.g., police presence, restricted access for community users, etc.)
- Availability of 24/7 space
- Availability of a free and accessible makerspace for 3D Printing, audiofile generation, etc.
- Device-neutral digital environment (access to materials and/or databases/platform vendors no matter what device)
- Number of classrooms available for reserving
- Number of hours open
- Number of study rooms available for reserving
- Spaces and/or services that support health and wellness (e.g., stress-busters during finals)
- Years since most recent renovation
- Write in:
- Write in:

4. The above questions list library inputs and outputs. Library research has indicated the importance of outcomes measures for indicating value to academic libraries' stakeholders (Oakleaf, 2010). For this section, please rank the correlations that could be used to measure outcomes of the 21st-Century Library to our stakeholders. Drag and Rank those options, with one being the highest ranked item.

- ARL statistics (e.g., number of professional library staff per student) with first-year retention rates and six-year graduation rates from IPEDS data
- Information literacy and/or critical thinking instruction with student GPA, retention, graduation rates, or higher GRE scores
- Library expenditures per student FTE with retention and graduation rates
- Library expenditures per student FTE with college or university rankings (e.g., *U.S. News & World Ranking*)
- Library instruction with paper and course grades
- Library resource and space usage with student GPA, retention, or graduation rates
- Library use of spaces, services or resources with faculty productivity (e.g., number of articles published)
- Library use of spaces, services or resources with statewide educational performance measures (e.g., linking library instruction with graduation rates for STEM majors)
- Research consultation visits with student scholarly output (paper grades, citations)
- Total library expenditures (professional salaries, monographs and serials, etc.) with fall-to-fall retention rates
- Write in:
- Write in:

5. I would like to add some 21st-Century trends and the metrics that I feel best go with them:
Trend & Metric:
Trend & Metric:
Trend & Metric:
Trend & Metric:

6. Please share any other thoughts that you have about appropriate metrics for a 21st century academic library or about this exercise/survey itself.

7. My current job title is:

8. I would like to be entered into a drawing to receive one of four $25 Amazon eGift cards (I understand from the informed consent form that my identification will be kept confidential). My e-mail address is:

Yes, my e-mail is: _____

No, thanks

Lean Libraries Optimize Outcomes!

Annie Norman
Delaware Division of Libraries, USA

Abstract

Showcasing value is an ongoing challenge for libraries. For more than a decade, Delaware libraries have been learning to design strategy, processes, and assessment based on methodologies used by businesses (Gore, DuPont, Siemens, and more) to achieve performance excellence. Additionally, action research was conducted with a "focus on the customer" which supported development of tips, tools, and techniques that patrons can use to maximize their informal learning while also documenting the libraries' contributions. The practical implications so far—support and funding for Delaware libraries—increased exponentially! Although primarily applied to Delaware public libraries, this approach has potential for showcasing value in all types of libraries. Adopting the "library business model" methodologies can help all libraries measure and maximize library value.

Public Libraries serve diverse needs every day:

- The preschooler, exposed to reading through story time
- The teen who wants to experiment with new technologies
- The senior who is seeking community connections and conversation
- The adult who has a dream and wants to start a business
- The senior who is seeking information about family legacy and ancestors
- The student who needs help with homework and school projects
- The immigrant who wants to learn English
- The single parent, who wants to take charge of finances
- The middle-aged adult, who was just laid off and desperately needs a job
- The homeless person, who needs shelter, food, and, in some cases, mental health care
- The person who needs assistance with computers and devices

And on and on...

To manage the diversity of needs that public libraries support, it helps to organize libraries' work conceptually. We designed the Dewey/Maslow framework for organizing library services and library data as a result of training in business tools, or tools that businesses use to achieve performance excellence. Lean is one of those tools. Lean is a method to make visible the cause and effect of what we do, how our processes and systems all hang together in the "business model," or library service model. Lean helps us sequence and think through the consecutive steps in the processes, from the inputs to the outputs, and to the outcomes for the customer:

- To ensure that our processes for delivering services are effective and aiming high
- To reduce waste and maximize our resources and effort
- To measure the cause and effect of what we do—which is what our funders want to know

The Dewey/Maslow framework uses two macro-organizers to encompass all potential services and community needs. Libraries support all subject areas, organized by the Dewey Decimal Classification system (the x axis). Libraries support all needs, from basic needs to transformational, organized using a modified version of Maslow's Hierarchy of Needs (y axis). Since Delaware libraries use the Dewey Decimal Classification System for their collections, the installed base, we now use that same taxonomy to track and align with programs and reference questions. Libraries, historically, have extensive methodologies for collection development and management, developed over many years. However, libraries do not have a similarly holistic and systematic methodology for program and services development.

Lean training also emphasized the use of live data in order to effect improvements. We embarked on establishing statewide systems in order to obtain shared live data. Delaware libraries now

have statewide systems, including a statewide ILS (delawarelibraries.org), a statewide calendar, and statewide reference data collection. We now have three years of trend data by subject (Dewey), statewide. We have inputs and outputs by subject for:

- Reference questions, where we are seeing lots of activity in assistance with devices and Reader's Advisory;
- Program Attendance, where we see activity in Summer Reading, Arts, and also Jobs and STEM; and
- Circulation, which consists of mostly fiction.

Subject is the match point, and is used as an indicator of what Delawareans are trying to do. Monitoring the patron use by subject is useful to help us identify emerging trends earlier, so we can be proactive in addressing community needs. Currently, the Dewey/Maslow framework is used in various ways and in several formats. A poster version is used at meetings and events for capturing information and for planning. Excel spreadsheets are used to collect quantitative and qualitative data, and for drafts of dashboard displays.

A systematic framework for library services is useful to determine current value and is also useful for strategic planning and to identify gaps in services. Libraries need to quantify their value to decision makers at *each level* that they are funded, such as local, regional, state, etc. Libraries are encouraged to use the Dewey/Maslow framework to view their services strategically, within their own library and in context with their neighbor libraries and libraries statewide. Libraries can use the Dewey/Maslow framework for an individual library, and for regional library services, too. When all the stories and data are organized in the Dewey/Maslow framework to see the cause and effect of what libraries offer to communities, it helps our funders as well as library staff see the benefits, too. By strategically organizing, connecting, and measuring library work across all our services, libraries can be more effective and influential in helping communities to evolve and transform.

We are beginning to look at community indicators, along with the Delaware Community Foundation, to see how the library outputs line up, and so we can see how libraries *contribute to* improving the community indicators. We can then adapt library services so that we increase the contributions to improving the community indicators. We align our Delaware partners with our framework, too. We currently have over 130 different partner organizations statewide, and more organizations join us all the time. The partners can use the framework to see who else they might partner with, and libraries can see where gaps are and in what areas we may need to seek additional partners.

In addition to the quantitative data by subject from our systems, we experiment with other methods to obtain the "voice of the customer" for input. Community conversations held in libraries are sorted by Dewey/Maslow for strategic planning. Delawareans are encouraged to capture their reading and learning over time. The original action research regarding informal tracking of curiosity and learning was conducted through a program called Learning Journeys, held in libraries and other venues throughout Delaware over several years. The program consisted of conversations with Delawareans about their informal learning paths, and any methods that they used to track their learning. Tips, tools, and techniques for tracking interests by subject are available in the Unleash Inner Genius libguide (guides.lib.de.us/unleashinnergenius). Beanstack is the online tool used statewide. Print tools called Learning Journals were developed, and 15,000 updated versions of each tool were recently published in summer 2016. The three-ring binder insert is targeted for children, and the smaller 5x7 journal is intended for teens and adults. Tracking enables individuals to make their learning and inspiration concrete and to build upon it, and also helps them identify and quantify what benefits they have received from libraries. Library services are expanding to provide additional experiences across all subject areas, and Delawareans are encouraged to sample a variety and to explore new passions. Expertise occurs *within* a discipline; innovation occurs *across* subject areas. Routine capturing of patron outcomes and next steps (with permission), along with the use data, all organized in the Dewey/Maslow framework can be used for ongoing library service development.

Our latest passion poster campaign for marketing libraries features Delaware legislators and other leaders. Like a READ poster campaign, but with a focus on passions rather than a particular book, we invite legislators to a photo shoot and ask them to bring along an object or symbol that represents their passion or inspiration. The response from the legislators, and their passions, has been fascinating, including:

- One legislator, a farmer, brought an enormous sweet potato and a ceremonial pitch fork
- Another legislator, a professor, brought a bust of Benjamin Franklin
- One legislator, a triathlete, brought her medals and running shoes

A professional photographer takes portrait photos and records a short video clip of the legislators talking about their passion or inspiration, how it was sparked, how it has influenced them over the course of their lives, and how libraries can help develop these passions. We inform the legislators that Delaware libraries support all subject areas and all types of interests that, with their example and encouragement, can further fuel the passions of all Delawareans. The legislators receive their own individual passion poster. Thumbnails of all of the passion posters are sorted and displayed in the Dewey/Maslow framework to show the variety of passions. A large version of the thumbnail poster will be provided to each public library once photos of all of the legislators have been obtained.

The Lean systematic approach to library services over the past decade has been beneficial for Delaware libraries in many ways. State officials, including Governor Markell, Secretary of State Bullock, and the General Assembly, supported the development of the statewide library technology infrastructure, and now fund 100% of all public library technologies. The state also provides up to 50% of funding for public library construction, and, with their support, library capacity has increased significantly as well. In an era of data-driven decision making, having live data has been essential to reporting on the value of their investments. Our next steps involve further work with partners on community indicators, more professional development for library staff, additional work on data management and display, and research on program development. We have found that other professions have a more defined methodology for program development that can possibly be adapted for libraries, and will perhaps provide techniques to support even greater outcomes for Delawareans.

Optimize your library's outcomes by learning from Lean! For all types of libraries, using the Dewey/Maslow framework for library services can help you organize, maximize, and showcase *your* library's value!

Academic Library Services and Undergraduate Academic Success: Trends in Research Literature

Ashlynn Kogut
Texas A&M University, USA

Abstract

Academic libraries are under increasing pressure from higher education administrators to demonstrate that library services contribute to student academic success. The purpose of this scoping review is to examine the research methods used to investigate academic library contributions to undergraduate academic success. After searching *ERIC*; *Library, Information Science & Technology Abstracts with Full Text*; and selected journals, 38 articles were included in this scoping review. The included articles used quantitative methods to primarily explore five academic success measures: grade point average, information literacy skills, retention, final degree attainment, and graduation rates.

This scoping review provides areas for librarians to consider when designing research studies about library contributions to student success. First, librarians should consider research designs that incorporate advanced statistical methods or qualitative methods. Second, when designing studies, researchers should consider utilizing higher education theoretical frameworks. Finally, research should be conducted to investigate the previously explored academic success measures from alternate angles or to explore unstudied academic success measures, like job placement, post-college performance, and graduate school entrance exams.

In *The Value of Academic Libraries,* Oakleaf conducted an extensive literature review focusing on how academic libraries have demonstrated that their services advance the missions of higher education institutions.[1] This scoping review examines the methods used in empirical research articles to investigate academic library contributions to undergraduate academic success since the publication of *The Value of Academic Libraries*. The findings from this scoping review will assist in the development of future research studies.

"Academic success" is a broad term used to describe outcomes, like graduation, grade point average (GPA), or career placement, that are the result of a student's higher education experience. The academic success measures of interest are identified in York, Gibson, and Rankin's Operationalized Model of Academic Success and described as student learning surrogates in *The Value of Academic Libraries*.[2] York, Gibson, and Rankin's Operationalized Model of Academic Success includes six categories of academic success measures: academic achievement, attainment of learning objectives, acquisition of desired skills and competencies, satisfaction, persistence, and post-college performance.[3] Oakleaf's student learning surrogates include: GPA, persistence, test scores, graduation rates, time to graduation, learning outcome attainment, transfer ready status, job placement, and post-college career advancement.[4] In the current era of higher education accountability, highlighting the outcomes related to the use of library services makes a stronger case.[5] Thus, when applying York, Gibson, and Rankin's Operationalized Model of Academic Success to the academic library context, I removed the satisfaction measure. This scoping review explores two research questions:

1. What academic success measures are explored in relation to academic library services?
2. What research designs have been used to study academic success measures and academic library services?

Research Methods

This research study used the scoping review method. Scoping reviews systematically explore the literature on a particular topic, but do not assess the quality of the research methods used in the included studies.[6] Arksey and O'Malley's scoping review framework outlines five stages: (1) identifying the research question; (2) identifying relevant studies; (3) study selection; (4) charting the data; and (5) collating, summarizing, and reporting the results.[7] In this section, I describe the search strategy used to identify relevant studies, the inclusion and exclusion

criteria used to select the studies, and the data management method used to chart the data.

Identifying Relevant Studies
For this scoping review, I searched two databases, *ERIC (EBSCO)* and *Library, Information Science & Technology Abstracts with Full Text (EBSCO)*, to identify scholarly literature. In addition, I searched key journals focusing on higher education and academic libraries. These journals included *The Journal of Higher Education*, *Research in Higher Education*, *portal: Libraries and the Academy*, *The Journal of Academic Librarianship*, *Evidence Based Library and Information Practice*, *College and Research Libraries*, and *College and Undergraduate Libraries*. The search was originally conducted in October 2015 and was updated in September 2016.

Three key concepts were identified from the purpose statement: academic libraries, undergraduate students, and academic success. In order to be comprehensive, I combined the three key concepts and related synonyms into one keyword search. I used two database limiters. I restricted the publication date to 2010 and later to encompass the dates after the publication of *The Value of Academic Libraries*. Due to the focus on research literature, I limited the search to academic journals.

Study Selection
I developed inclusion and exclusion criteria to select the studies. All included articles had to be empirical studies published from 2010 to present. Other inclusion criteria were an academic or college library context, an undergraduate student study population, primary focus on academic success measures, and English language. If the study population included graduate students as well as undergraduate students, I included the study as long as the results pertaining only to undergraduates could be identified in the findings. In order to focus on long-term learning outcomes, I included studies related to the attainment of information literacy skills only if the students were studied over multiple years or if comparisons were made between different classifications of students (e.g., freshman, sophomore, junior, senior).

I also applied exclusion criteria to assist the study selection. I excluded literature reviews and review articles because these articles would not report original research studies. Due to the focus on academic success measures, an article was excluded if it

- focused on student satisfaction with library services;
- reported only library service usage statistics;
- described the development of a program, project, or service model;
- tested the effectiveness of a teaching method; or
- reported a single class, a single activity, or grade on a single assignment in a library instruction class or workshop.

The combined search result from both databases was 763 articles. I exported the articles to EndNote bibliographic software for de-duplication and screening. After removing 67 duplicates, I screened the abstracts of 696 articles using the inclusion and exclusion criteria. After the abstract screening, 76 articles remained for full-text review. Following the application of the inclusion and exclusion criteria to the full-text articles, 28 articles from the database searches met the inclusion criteria. I included seven articles after searching the key journals and three articles after consulting the reference lists of the included articles. This scoping review included 38 articles.

Charting the Data
Each article selected for inclusion was described in an Excel summary table. The description of each article included the author(s), year of publication, journal, academic success measures, study location, research methods, and participant sample. The appendix includes the summary table of these 38 articles.

Findings
This scoping review included 38 articles related to academic library services and undergraduate academic success. The fifth stage of Arksey and O'Malley's scoping review framework, summarizing and reporting the results, is described in this section.[8] First, I provide an overview of the publication characteristics of the 38 articles. Then, I answer the study's research questions by reporting the academic success measures explored and the research designs used in the included articles.

Overview of the Articles
In the included articles, there are trends in the journals, the authors, and the study locations. Eighteen different journals published the included articles; however, only one journal is outside of

the library science field (see Table 1). Some of the researchers focusing on this topic are prolific in their research output. Three research teams published more than one article. The study locations show that exploring academic libraries and academic success is a topic of international interest (see Table 2). Twenty-five of the study locations were in the United States, and thirteen of the study locations were outside of the United States.

Table 1. Included articles by journal

Journal	Articles
College & Research Libraries	11
Journal of Academic Librarianship	7
portal: Libraries & the Academy	3
Evidence Based Library & Information Practice	3
Library & Information Science Research	1
Journal of the Canadian Health Libraries Association	1
College & Undergraduate Libraries	1
Education Libraries	1
Liber Quarterly: The Journal of European Research Libraries	1
Library Management	1
Communications in Information Literacy	1
Libri: International Journal of Libraries & Information Services	1
Nurse Education in Practice	1
Reference Services Review	1
Australian Academic & Research Libraries	1
Serials	1
Annals of Library & Information Studies	1

Table 2. Included articles by study location

Study Location	Articles
United States	25
United Kingdom	4
Hong Kong	3
Australia	2
Canada	1
Ireland	1
Jordan	1
Nigeria	1

Academic Success Measures Explored in Relation to Academic Library Services

Retention, GPA, degree attainment, information literacy skills, and graduation rates were the most frequent academic success measures explored in the included articles. Academic skill development, academic engagement, and engagement in scholarly activities were explored in one article.[9] Nine articles only examined the library's relationship to student GPA,[10] and 10 articles only explored the development of information literacy skills.[11] Five articles investigated only retention,[12] and

four articles focused on final degree attainment, a cumulative grade placed on the final degree in the United Kingdom.[13] I included final degree attainment as a separate academic success measure because it is related to GPA but distinct in its use to categorize the level of final degrees. The remaining 10 articles included multiple measures examined together,[14] and in these articles, retention was the most frequently occurring measure of academic success.

When examining the number of times individual academic success measures were explored individually or jointly with other measures, GPA and retention were the most frequently occurring measures. GPA was a measure in 16 articles, and retention was a measure in 13 articles. The majority of articles that focused on retention examined the retention of freshmen. Most articles focusing on GPA studied undergraduates of all classifications. However, when focusing on a particular classification, freshman and senior GPAs were the most studied.

Research Designs Used to Study Academic Success and Academic Library Services

Every included article used a quantitative method. Thirty-one out of the 38 articles used quantitative methodology exclusively, and the remaining seven articles used mixed methods. Despite the ubiquity of quantitative methods, only four articles articulated and used a theoretical framework. Three articles used Astin's Input-Environment-Outcome model.[15] The other article used Vincent Tinto's model of student integration.[16]

The majority of the quantitative methods do not require extensive knowledge of statistical procedures. Eight articles only analyzed descriptive statistics, like percentages, means, and standard deviations, to draw conclusions.[17] Three articles used only the Pearson correlation to analyze the data for the presence of a relationship.[18] One article used the chi-square test for independence alone,[19] and four articles used the chi-square test with other simple statistical methods.[20] Three articles used t-tests or z-tests with other simple statistical methods to analyze data.[21] The Mann-Whitney U Test, an alternative to the t-test test, was used in three articles.[22] Some studies that utilized more advanced statistical procedures also used simple procedures, like the Pearson correlation, chi-square tests, and t-tests to analyze data. These procedures are not included in the counts above.

In the 14 articles that used more advanced statistical procedures, regression analysis, used in nine articles, was the most popular data analysis method.[23] Two articles used ANOVA to analyze data.[24] Propensity score matching,[25] generalized estimating equation,[26] and predictive model search[27] were other named statistical procedures. Of the articles that used advanced methods, nine had a non-library collaborator explicitly identified.[28]

In the seven mixed methods studies, surveys and focus groups were the qualitative methods used in conjunction with quantitative methods. Three articles described the free text responses on surveys as qualitative data.[29] Stone and Ramsden and Stone, Pattern, and Ramsden used focus groups as part of their data collection to explore the lack of correlation between variables.[30] Bowles-Terry also used focus groups in her mixed methods study.[31] Massengale, Piotrowski, and Savage utilized action research methods by analyzing student GPAs and then reporting the findings back to a student group for feedback.[32]

Another aspect of study design is selection of the participants. Academic success was examined at two levels: the student level and the university level. Thirty-three of the articles explored the relationship between use of library services and academic success by using individual students as the unit of analysis. The other five articles looked at data aggregated at the university level to explore how library services can impact a university's retention and/or graduation rates.[33]

Researchers gathered data from publicly available data sources, university data sources, library usage statistics, and library-developed data collection instruments. The five studies that looked at the university level gathered data from publicly available data sources: Integrated Postsecondary Education Data System (IPEDS), National Center for Education Statistics Academic Library Survey, ACRL*Metrics* database, and ARL statistics. Twenty-two studies combined university data, like demographics, enrollments, and GPA, with library usage data. Library usage measures included checkouts, proxy logins, library instruction attendance, workstation utilization, group study room reservations, research clinic attendance, access to the building, interlibrary loan requests, electronic book usage, website logins, reference, and chats. Ten studies focused on the attainment of information literacy

skills and included data from surveys, tests, and course assignments.

Discussion

Two main findings answer this scoping review's research questions. First, five academic success measures are primarily explored in the included articles. Second, quantitative methods are ubiquitous in the research designs used in the articles.

Academic Success Measures

Retention, GPA, degree attainment, information literacy skills, and graduation rates are the five most common academic success measures explored in the included articles. One explanation for the exploration of these five academic success measures is ease of access. Retention and graduation rates for undergraduate students at colleges and universities participating in federal financial aid programs are publicly available. University offices collect data on GPA and final degree attainment. Access to this data requires librarians to collaborate with other campus units, but the prevalence of these measures shows that librarians are succeeding in making these collaborations. The availability of student information literacy skill attainment data can be attributed in part to the increasing importance of learning outcomes assessment within libraries.[34] The inclusion of general academic skill development, academic engagement, and engagement in scholarly activities shows an interest in investigating harder-to-capture measures of student academic success.

Academic success measures that are absent from the included articles include post-college performance, test scores, transfer ready status, job placement, and post-college career advancement. These measures of academic success are more difficult to capture. Students might not take standardized graduate school entrance exams (e.g., MCAT, GMAT) until after graduating from college. Universities often rely on student surveys for reports of job placement and career advancement. Even when reported by colleges, job placement data has been criticized as undependable and inaccurate due to low response rates and broad questions.[35]

Research Designs

All articles used quantitative research methods. Lack of librarian training in robust research methods contributes to the use of basic statistical methods, but the findings illustrate that librarians are collaborating with researchers outside of the library to use more advanced statistical methods. The frequent use of correlational studies can be attributed in part to the influence of Oakleaf.[36] In *The Value of Academic Libraries,* Oakleaf outlined a research agenda that listed correlations between library services and student success for librarians to investigate. Additionally, Oakleaf advocates for the use of correlational research in demonstrating relationships between academic success and library services despite the causal limitations of correlation methods.[37]

Implications

For researchers, the findings of this scoping review highlight multiple areas to consider when designing future studies. The studies available exploring the relationship between academic libraries and undergraduate academic success provide multiple examples to use when considering a replication study at a specific institution. However, when looking at the body of research available at the field level, there are four areas that can contribute to the current knowledge base. First, researchers should use research designs beyond simple statistical methods. Additional mixed methods and qualitative studies should also be considered to explore the topic from alternative research perspectives. Second, research should be conducted to investigate the frequently studied academic success measures from alternate angles as well as to explore the ways that academic libraries contribute to job placement, post-college performance, and professional tests. Oakleaf also calls on librarians to expand their outcomes research beyond GPA, retention, and graduation to investigate other measures like professional test scores and career and internship placement.[38] Third, when designing studies, researchers should consider utilizing higher education theoretical frameworks. The theoretical framework grounds the study in work that other educational researchers have conducted and acknowledges that academic libraries are part of the field of higher education. Finally, researchers need to publish outside of library venues. Until librarians widely disseminate their research findings, the role that academic library services play in undergraduate academic success will remain unknown to the larger higher education community.

Conclusion

This scoping review shows that researchers are utilizing quantitative and mixed methods research approaches to investigate the library's connection to undergraduate academic success. Researchers

can build on the research designs of prior studies when designing new studies to empirically demonstrate how academic library services impact student success. By considering alternative success measures and research methods, the library field can build a robust body of research literature that explores the library's connections to undergraduate academic success.

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Appendix

	Author & Year	Journal	Study Location	Academic Success Measures	Research Methodology	Data Collection	Participant Sample	Data Analysis
1.	Allison, 2015	*portal: Libraries & the Academy*	United States	GPA	Quantitative	University data (class standing, GPA); Library data (proxy server, checkouts)	Student	Descriptive statistics (mean, percentage); Regression analysis; Pearson correlation
2.	Bowles-Terry, 2012	*Evidence Based Library & Information Practice*	United States	GPA	Mixed Methods	Focus groups; University data (transcripts); Library data (library instruction)	Student	ANOVA
3.	Chan, 2016	*Communications in Information Literacy*	Hong Kong	Information Literacy Skills	Quantitative	Pre/post test	Student	Descriptive statistics (percentage)
4.	Cherry, Rollins, & Evans, 2013	*College & Undergraduate Libraries*	United States	GPA	Quantitative	University data (GPA, school, class); Library data (proxy server)	Student	Pearson correlation
5.	Chiteng Kot & Jones, 2015	*College & Research Libraries*	United States	GPA	Quantitative	University data (student background, academic records); Library data (workstation use, group student room reservations, research clinic attendance)	Student	Propensity score matching
6.	Cook, 2014	*College & Research Libraries*	United States	Graduation; GPA	Quantitative	University data (course enrollment, graduation date, GPA)	Student	Chi-square test for independence; Two sample z-tests
7.	Crawford, 2015	*portal: Libraries & the Academy*	United States	Graduation; Retention	Quantitative	IPEDS; NCES Academic Library Survey	University	Pearson correlation; ANOVA; T-tests
8.	Daugherty & Russo, 2011	*Journal of Academic Librarianship*	United States	Information Literacy Skills	Mixed Methods	Survey	Student	Descriptive statistics (count, percentage), Chi-square test for independence; Coding

	Author & Year	Journal	Study Location	Academic Success Measures	Research Methodology	Data Collection	Participant Sample	Data Analysis
9.	Emmons & Wilkinson, 2011	*College & Research Libraries*	United States	Graduation; Retention	Quantitative	ARL Statistics; IPEDS	University	Descriptive statistics (count, mean, median, mode, standard deviation, skewness, kurtosis, range); Regression analysis
10.	Eng & Stadler, 2015	*Evidence Based Library & Information Practice*	United States	Retention	Quantitative	ACRL Metrics	University	Pearson correlation
11.	Farrell, Goosney, & Hutchens, 2013	*Journal of the Canadian Health Libraries Association*	Canada	Information Literacy Skills	Quantitative	Survey	Student	Descriptive statistics (count, percentage)
12.	Goodall & Pattern, 2011	*Library Management*	United Kingdom	Final degree attainment	Quantitative	University data (courses, level, year group, school); Library data (checkouts, electronic resource use, building use)	Student	Charts
13.	Haddow, 2013	*Library & Information Science Research*	Australia	Retention	Quantitative	University data (enrollment, demographics); Library data (electronic resource logins, checkouts)	Student	Descriptive statistics (mean, median, mode, range, skew)
14.	Haddow & Joseph, 2010	*Australian Academic & Research Libraries*	Australia	Retention	Quantitative	University data (enrollment, demographics); Library data (checkouts, workstation logins, electronic resource logins)	Student	Mann-Whitney test; Descriptive statistics (frequencies, cross tabulations)
15.	Holliday et al., 2015	*College & Research Libraries*	United States	Information Literacy Skills	Quantitative	Course assignment	Student	VALUE rubric; Descriptive statistics (mean, standard deviation, percentage)
16.	Issa, Amusan, Olarongbe, Igwe, & Oguntayo, 2015	*Annals of Library & Information Studies*	Nigeria	Information Literacy Skills	Quantitative	Survey	Student	Descriptive statistics (count, percentage)
17.	Lalor, Clarke, & Sheaf, 2012	*Nurse Education in Practice*	Ireland	Information Literacy Skills	Quantitative	Pre/post-test; Course assignment	Student	Descriptive statistics (count, percentage)

	Author & Year	Journal	Study Location	Academic Success Measures	Research Methodology	Data Collection	Participant Sample	Data Analysis
18.	Massengale, Piotrowski, & Savage, 2016	*College & Research Libraries*	United States	GPA	Mixed Methods	University data (early warning system); Library data (building use, instruction, research help, laptop checkouts, study room reservations, 3D printer requests, electronic resource usage); Focus group	Student	Descriptive statistics (mean, count, ratio, percentage); Action research
19.	Mezick, 2015	*Journal of Academic Librarianship*	United States	Retention	Quantitative	Survey of ARL libraries; IPEDS	University	Fisher's exact test
20.	Murray, Ireland, & Hackathorn, 2016	*College & Research Libraries*	United States	Retention	Quantitative	University data (demographics, enrollment status); Library data (checkouts, proxy server, computer lab use, ILL, instruction sessions, credit bearing IL course, use of writing center, use of oral communication center)	Student	Descriptive statistics (count, percentage); Regression analysis
21.	Odeh, 2012	*Libri: International Journal of Libraries & Information Services*	Jordan	GPA	Quantitative	University data (GPA); Survey; Interviews	Student	T-tests; Descriptive statistics (count, percentage, mean, standard deviation); Spearman correlation
22.	Pan, Ferrer-Vincent, & Bruehl, 2014	*Journal of Academic Librarianship*	United States	Information Literacy Skills	Mixed Methods	Survey; Course assignment	Student	Citation analysis; Regression analysis; Descriptive statistics (count, percentage)
23.	Samson, 2010	*Journal of Academic Librarianship*	United States	Information Literacy Skills	Quantitative	Course assignment	Student	Chi-square test for independence; Rank-sum test

	Author & Year	Journal	Study Location	Academic Success Measures	Research Methodology	Data Collection	Participant Sample	Data Analysis
24.	Scarletto, Burhanna, & Richardson, 2013	*Journal of Academic Librarianship*	United States	GPA; Retention	Mixed Methods	University data (demographic data, GPA, department, major); Library data (building use); Survey	Student	Descriptive statistics (count, percentage, mean); Chi-square test for independence; T-tests
25.	Scott, 2014	*Journal of Access Services*	United States	GPA	Quantitative	University data (GPA, class standing, department); Library data (ILL)	Student	Descriptive statistics (count, mean, percentage)
26.	Soria, Fransen, & Nackerud, 2016	*College & Research Libraries*	United States	GPA; Academic skill development; academic engagement; engagement in scholarly activities	Quantitative	University data (GPA, Student Experience in the Research University Survey); Library data (books, web-based services, classes, reference, computer workstation use)	Student	Factor analysis; Regression analysis
27.	Soria, Fransen, & Nackerud, 2014	*Journal of Academic Librarianship*	United States	Retention; GPA	Quantitative	University data (demographics, college, GPA, enrollment); Library data (database logins, ebooks, checkouts, ejournals, ILL, peer consultations, reference chats, website logins, workshops attended, workstations use)	Student	Regression analysis

	Author & Year	Journal	Study Location	Academic Success Measures	Research Methodology	Data Collection	Participant Sample	Data Analysis
28.	Soria, Fransen, & Nackerud, 2013	*portal: Libraries & the Academy*	United States	Retention; GPA	Quantitative	University data (demographics, GPA, enrollment); Library data (database logins, ebooks, checkouts, ejournals, ILL, peer consultations, reference chats, website logins, workshops attended, workstations use)	Student	Chi-square test for independence; T-tests; Regression analysis
29.	Stemmer & Mahan, 2015	*Evidence Based Library & Information Practice*	United States	Retention; GPA; Graduation	Quantitative	University data (demographics, GPA, enrollment); Survey	Student	Regression analysis; Chi-square test for independence
30.	Stemmer & Mahan, 2016	*College & Research Libraries*	United States	Retention; GPA; Graduation	Quantitative	University data (demographics, GPA, enrollment); Survey	Student	Regression analysis; Chi-square test for independence
31.	Stone, Pattern, & Ramsden, 2011	*Liber Quarterly: The Journal of European Research Libraries*	United Kingdom	Final degree attainment	Mixed Methods	University data (year of graduation, course, grades, academic department); Library data (checkouts, building use, electronic resource logins); Focus groups	Student	Mann-Whitney test; Kruskal-Wallis test
32.	Stone & Ramsden, 2013	*College & Research Libraries*	United Kingdom	Final degree attainment	Mixed Methods	University data (year of graduation, course, grades, academic department); Library data (checkouts, building use, electronic resource logins); Focus groups	Student	Mann-Whitney test; Kruskal-Wallis test; Grounded theory

	Author & Year	Journal	Study Location	Academic Success Measures	Research Methodology	Data Collection	Participant Sample	Data Analysis
33.	Stonebraker & Fundator, 2016	*Journal of Academic Librarianship*	United States	Information Literacy Skills	Quantitative	Pre/post Test	Student	Descriptive statistics (mean, standard deviation); Generalized estimating equation; T-tests
34.	Teske, DiCarlo, & Cahoy, 2013	*Reference Services Review*	United States	Retention; Graduation	Quantitative	IPEDS, NCES Academic Library Survey	University	Pearson correlation; Predictive model search
35.	Travis, 2011	*Education Libraries*	United States	Information Literacy Skills	Quantitative	Survey	Student	Descriptive statistics (count, percentage)
36.	White & Stone, 2010	*Serials*	United Kingdom	Final degree attainment	Quantitative	University data (grades); Library data (checkouts, building use, electronic resource logins)	Student	Descriptive statistics (mean, percentage, ratio)
37.	Wong & Webb, 2011	*College & Research Libraries*	Hong Kong	GPA	Quantitative	University data (GPA, graduation year); Library data (checkouts)	Student	Pearson correlation
38.	Wong & Cmor, 2011	*College & Research Libraries*	Hong Kong	GPA	Quantitative	University data (GPA); Library data (library workshop attendance)	Student	Chi-square test for independence

Assessing User Engagement with Library Exhibits Using Eye Tracking

Kris M. Markman
Harvard University, USA

Introduction

Brown and Power[1] note that, while exhibits have long been a primary focus of museums, this activity has historically been less common in libraries. However, they also point out the numerous advantages for library exhibits, particularly in the way that exhibits allow for opportunities for teaching and learning. Published research on library exhibits is quite sparse, with most work dedicated to how-to guides[2] or case studies of specific exhibits.[3] Within the area of museum studies, more attention has been paid to examining visitor experience, although this research tends to be conducted through surveys and similar techniques.[4] More recently, museum studies scholars have included observational methods as part of visitor experience research.[5] Fouracre[6] argues that, with the increasing use of exhibits in libraries, more evaluation of these exhibits is required. In particular, Fouracre notes that new technologies such as eye tracking have great potential for the study of visitor behavior in libraries.

This study compared two exhibits in two different Harvard Library special collections exhibit spaces. The study was exploratory in nature, designed both to explore the possibilities of using wearable eye tracking to study library exhibits and to give some basic insights into how visitors interact with exhibits that are predominantly composed of textual objects. I chose two different exhibit spaces with two different layouts in order to gain some insight into how the physical organization of the space influences visitors' trajectories.

Background

Eye tracking technologies use infrared sensors to detect participants' pupils and track eye movements across a target, for example a computer screen. Eye tracking technology is also available in wearable form as lightweight glasses. In both types of eye trackers, proprietary software from the vendor uses algorithms to map the sensor input from the participant's eyes onto the screen, or the physical space in the case of wearable eye trackers. The software then outputs a video recording of the screen or environment, overlaid with a visualization representing the participant's gaze points as determined by the software. In the case of wearable eye tracking, the end result is a video representing the participant's visual field, and a small circle that moves across the field, indicating the participant's gaze across the environment (see Figure 1).

Figure 1. Example of output from wearable eye tracker. The circle in the upper center represents the participant's gaze.

Wearable eye trackers have been used in museum studies, and have illuminated otherwise inaccessible aspects of the visitor experience. For example, Eghbal-Azar and Widlok[7] used wearable eye trackers to compare how novices and experts interacted with a museum exhibit. One advantage they found for using eye tracking, as opposed to in-person observation, was that the eye tracker was able to detect how visitors alternated viewing two small displays that were located next to each other. Brieber, Nadal, Leder, and Rosenberg[8] used eye tracking glasses to compare how participants viewed artwork in a lab setting versus in a museum environment. Overall, they found that people viewed more artworks in the museum setting versus the lab, although label-viewing time did not differ between conditions. They also found that viewing time was greater when participants had more appreciation for and understanding of the artworks. Both of these studies demonstrate the promise that wearable eye tracking holds for the study of library exhibits.

Studying Exhibits at Harvard Library

Two exhibits were chosen for this study. *Opening New Worlds: The Colonial North American Project* exhibition highlighted "some of the remarkable material and work that is part of the multi-year Colonial North American Project at Harvard University."[9] The Colonial North American (CNA) exhibit was open from late January through April 29, 2016, in the Lammot du Pont Copeland Gallery in Pusey Library. The exhibit *Shakespeare: His Collected Works* commemorated the 400th anniversary of Shakespeare's death and presented "over eighty rare and unique objects—many never before seen—drawn from the Harvard Theatre Collection"[10] and other departments of Houghton Library. The exhibition was open from January 19 through April 30, 2016, in the Edison and Newman Room in Houghton Library. There were several reasons that these exhibitions were chosen for this study. First, both were highly visible exhibitions on popular subjects. In addition, the Pusey and Houghton Libraries are physically adjacent in Harvard Yard (Pusey Library is underground), and both are also located in close proximity to the User Research Center at Harvard Library,[11] our user experience lab in which the study was based. Finally, the two libraries have very different exhibit spaces. Houghton's Edison and Newman Room is a large rectangular room with four main floor standing exhibit cases along each side of the room. There is also additional space on wall panels to hang exhibit items. There is only one public entrance to the Edison and Newman Room. By contrast, the Copeland Gallery in Pusey Library is a long galley space with four wall mounted exhibit cases along one wall. The space then opens up into a larger area where both the Harvard University Archives and the Harvard Theatre Collection can be accessed. This

area includes wall space for mounting posters, a long floor standing exhibit case, and is open to another galley exhibit space belonging to the Harvard Maps Collection. This area in turn connects to the Lamont Library. Therefore, exhibits in the Copeland Gallery can be accessed either from the official entrance to Pusey Library, or from the other side from the Maps Collection. Thus visitors to the space may begin at the "entrance" of the exhibit or at the "exit," depending on which library entrance they choose.

This short paper discusses findings related to two research questions out of the larger study. Specifically:

> RQ1. How do users physically navigate library exhibits given different case/ room layouts?
>
> RQ3. How much time do users spend reading exhibit labels?

Data Collection

Participants were recruited through a variety of means, including through tent cards on tables in the reading rooms, through cards handed out to students who came for classes in the two repositories, and online through Facebook posts and e-mails circulated to different student distribution lists. Participants could choose to participate in either the Colonial North American exhibit study or the Shakespeare exhibit study. Participants who signed up met a research assistant at the User Research Center for the CNA exhibit or at Houghton Library for the Shakespeare exhibit, and were provided with an informed consent document. They were then brought to the selected exhibit by the research assistant. Before entering the exhibit space, participants were asked to put on the Tobii Glasses 2[12] head unit, which is connected to a battery-powered recording unit. In order to collect valid eye tracking data, the glasses must be calibrated to each new participant. In the calibration process, participants were asked to look at a small calibration card held in front of the participant for a few seconds. The research assistant then started the recording from Tobii Glasses Controller software running on a Windows tablet.

Participants were asked to walk around the exhibit space for around six minutes and look at whatever they were interested in. This duration was chosen to facilitate scheduling and data collection. Because the Pusey Library exhibit space has two possible entry points, some participants who viewed the CNA exhibit were asked to start from the official entrance of Pusey Library, and some from the Map Collection exhibit side. For the Shakespeare exhibit, all of the participants started from the public entrance of the Edison and Newman Room on the first floor of Houghton Library. After the eye tracking portion of the study concluded, participants were given an iPad and asked to fill out a short background questionnaire that included questions about demographic information and familiarity with the exhibition (see Table 1).

Participants

There were a total of 34 participants (26 women) who completed the study and the exit questionnaire, of whom 23 had valid eye tracking data. Eye tracking data may be regarded as invalid because of one of the following reasons:

1. Calibration failed
2. Gaze sample percentage was below 75%
3. Tobii Glasses 2 suddenly disconnected from Tobii Glasses Controller software

The average age of participants was 26. There were three visitors/tourists, and all other participants were members of the Harvard community. Of their highest level of education completed, 11 had some college, 16 had a bachelor's degree, five had a master's degree, and one had a professional degree (MD, JD, etc.).

CNA participants included 15 adults, 11 of whom had valid eye tracking data. Of those 11 individuals (8 women), 10 reported being a Harvard student, faculty member, or staff member, and one was a visitor or tourist. Seven were asked to start from the entrance and four from the map collection side. Shakespeare participants included 19 adults, 12 of whom had valid eye tracking data. Of those 12 individuals (9 women), 11 reported being a Harvard student, faculty member, or staff member, and one was a visitor or tourist. Overall, participants were moderately familiar with the topics of both exhibits, and the Shakespeare exhibit received slightly higher scores on all five questions than did CNA.

Table 1. Mean scores for post-test questionnaire (5 = Strongly agree)

	CNA valid	Shakespeare valid	All participants
I am interested in the topic of this exhibit.	3.73	4.33	3.97
I am familiar with the topic of this exhibit.	2.55	3.75	3.29
I am knowledgeable about the topic of this exhibit.	2.45	3.00	2.85
I enjoyed viewing the exhibit.	3.91	4.50	4.18
I would visit another Harvard Library exhibit in the future.	4.27	4.58	4.38

Results and Discussion

For the initial data analysis, videos were coded in qualitative data analysis software NVIVO based on what participants looked at first, and then how many labels participants viewed across all of the objects in the exhibit. Label viewing was further coded for whether the label was skimmed versus read carefully.

Colonial North American

Overall for the CNA exhibit, participants noticed 52% of item labels, and of those read 27% carefully. Each case also contained a poster, and there were several other posters mounted on the walls in the space or wrapped around support columns. Of the posters, participants noticed 65% and read 35% carefully. Figure 2 presents a summary of how participants viewed labels within each exhibit case, including complementary wall items that were included with Cases 1 through 4. In Figure 3, I present a simplified view of participants' trajectories through the exhibit, focusing on the first three objects they visited.

Figure 2. Colonial North American label viewing within cases

Case	Number of Participants	Labels read or skimmed
1. Overview	2	100%
2. The Hancocks and Harvard	9	60%
3. Politics in the Early American Republic	10	55%
4. Sermons, Religion, and Native Americans	7	51%
5. The Winthrops: Science, Mathematics, Working Women, and Family	7	60%

Figure 3. Colonial North American visitor trajectories. Superscript M indicates participants who started at the Maps Collection end of the exhibit.

	First Object	Second Object	Third Object
E01	Introduction Poster	Case 1	Ward Poster
E02	Case 1	Introduction Poster	Case 2
E03[M]	Case 5	TV & Posters	Collection Posters
E12	Introduction Poster	Case 2	Ward Poster
E18[M]	Case 5	TV & Posters	Case 4
E22	Introduction Poster	Case 2	Case 3
E24[M]	TV & Posters	Case 5	
E27	Introduction Poster	Case 2	Case 3
E30	Case 1	Introduction Poster	Case 2
E35[M]	Case 5	TV & Posters	Case 4
E36	Ward Poster	Introduction Poster	Case 2

Shakespeare

The Shakespeare exhibit had items in eight display cases, plus one additional case that contained only a copy of Shakespeare's first folio, with the exhibit introduction poster on a stand between it and Case 1. There were also two large posters and several other items mounted on wall panels around the room.

Overall for the Shakespeare exhibit, participants skimmed 46% of all labels and carefully read 23%. Participants skimmed 40% of the framed items and carefully read 19%. Figure 4 presents a summary of how participants viewed the labels within the main exhibit cases. Figure 5 presents the first three objects participants visited in the exhibit.

Figure 4. Shakespeare label viewing within cases

Case	Number of Participants	Labels read or skimmed
1. Harvard's Shakespeare	8	38%
2. Early Editions	9	54%
3. Readers and Respondents	10	41%
4. Actors	10	56%
5. Actresses	8	39%
6. Behind the Scenes	8	33%
7. Stagecraft	6	33%
8. Costume Design	6	48%

5. Shakespeare visitor trajectories

	First Object	Second Object	Third Object
E04	Caliban Poster	Case 8	Case 7
E05	Podium	Caliban Poster	Case 1
E08	Introduction	First Folio	Case 1
E09	Wall Panel 1	Case 2	Case 3
E10	Caliban Poster	First Folio	Introduction
E13	Podium	Case 8	Case 7
E14	First Folio	Introduction	Case 1
E16	Case 8	Case 7	Case 6
E21	First Folio	Case 1	Case 2
E28	Case 8	Case 7	Case 6
E33	Case 8	Case 7	Books
E37	Case 8	Wall Panel 6	Case 7

Discussion

One of the underlying motivations for this study came from conversations with curators, all of whom were interested to know if anybody actually reads the labels that curators spend so much time carefully crafting. In this exploratory study, the answer seems to be a resounding "sometimes." Overall, participants looked at around half of the labels, but only read

about one-quarter to one-third carefully. However, it is important to note that, while participants were not reading all of the labels, they were looking at different labels, and in this initial analysis there are no clear patterns in what participants looked at. One emerging pattern, however, is that there did seem to be participants who were more "readers," who carefully read every label in every case they viewed, and others who were more "skimmers," who seemed to scan the cases and then pick out only a few objects for more lengthy consideration. This suggests that curators should try to strike a balance between enough information to satisfy the "readers" without overwhelming the "skimmers." In both of the exhibits under study, the cases were fairly densely filled. It is also possible that fewer items per case, with more space around the items, might encourage skimmers to look more closely at more items. Given that this was an exploratory study, additional research is needed.

Another interesting finding relates to how participants navigated the two exhibit spaces. Importantly, none of the CNA participants who started from the Map Collection side (the "end" of the exhibit) ended up following the exhibit order. Although this is not the "official" way to enter this space, it is nevertheless a very common way for visitors to find the Pusey exhibit space. It is also a very common traffic pattern for students, since the Map Collection hallway connects directly to the undergraduate library. It is possible that exhibit visitors may feel confused if entering from this direction, because the wall mounted cases are not clearly visible, nor is it clear that there is a formal entrance to the space. In the case of the CNA exhibit, there were two posters on either side of a TV mounted on one of the walls in the space that opens to the Map Collection. One of these posters was a duplicate of the Exhibition Introduction poster that was also mounted on the wall next to Case 1. This poster appeared helpful to participants in this study; however, it may be even more helpful to have a clear sign telling visitors that the exhibit actually starts at the other end of the galley.

Another interesting traffic pattern emerged in the Shakespeare exhibit. Even though all participants started from the same doorway, 4 of the 12 participants with valid eye tracking data started from Case 8 and did not follow the exhibit order at all. Since they did not realize that they were actually viewing the exhibit in a wrong order, there is a high possibility that they did not notice the number signs in each case. In the case of the Shakespeare exhibit, the cases were organized thematically rather than chronologically; however, past exhibits in Houghton have relied on chronology and the order of the cases to tell their stories. Therefore, it may be worth considering whether the number sign for each case can be designed in a more obvious manner. Alternatively, if following the exhibit order is important, a more prominent "START" sign could be posted by Case 1. There was an "Exhibit Introduction" poster between the first folio case and Case 1, but many of our participants did not notice the poster and therefore may not have thought about the exhibit having an "order."

These are a few of the initial observations from the first round of data analysis. In future work, I plan to continue to analyze the data from this study, particularly to see if there are any connections between how participants view the objects and labels and their responses to the questionnaire. I also plan to do more fine-grained analysis of participants' viewing patterns within each case. The initial observations from this study also point to many more questions to be pursued in future research, particularly by exploring different types of exhibit spaces and different types of case arrangements.

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Why Seek Expertise in an Age of DIY? One Library's Qualitative Approach to Understand When and Why Students Seek Reference Assistance

Marc Vinyard and Jaimie Beth Colvin
Pepperdine University, USA

Colleen Mullally
North Andover Public Schools, USA

Abstract

Have you ever been frustrated by the limitations of reference statistics to understand your users' motivations and needs? Librarians at Pepperdine University wanted to know why students continue to ask librarians for research assistance in an era of declining national reference statistics. We scrutinized our increasingly detailed reference statistics, but they failed to provide the explanations we wanted. Most of the literature on help-seeking behavior discusses reasons why students do not ask librarians for help, but we were interested in students' motivations for seeking assistance. We conducted a qualitative study to (1) better understand what prompted students to ask librarians for help, and (2) learn more about how students search for information. To answer these questions, we conducted semi-structured interviews with undergraduate students who had received reference assistance. By conducting interviews, we could overcome the limitations of quantitative data by better understanding students' emotions and asking probing follow-up questions. The interviews were recorded and transcribed. Using the technique of applied thematic analysis to make sense of the transcripts, we created a codebook and applied codes to the transcripts using NVivo software. We organized the codes into six themes:

1. How students research
2. Perceptions of their research skills
3. Assumptions held, both about the library and the process of searching for information
4. Motivation for asking for help
5. Path to the librarian
6. Experience working with a librarian

Some of the insights we uncovered during the interviews included:

- Students' "do-it-yourself" research preference and emotions during the research process
- Leading catalysts motivating students to ask a librarian for help
- Surprising assumptions students make about library services
- Time devoted by students when attending to challenging research questions
- Limitations of students' research skills when they search for information independently

The information gleaned from our study provides insight into our students' research motivations, habits, and challenges. It gave us the opportunity to assess the overall experience of students' satisfaction with our research services. The findings help us to tell a better story than usage statistics alone. We hope that, by sharing our research process with other librarians, we can inspire other librarians to seek qualitative data such as student interviews when assessing services and evaluating statistics.

Introduction

According to national trends on reference statistics from ARL, reference questions are declining; however, at our university, reference statistics are on the rise. While this is great news, we did not know why this was happening. Our research focused on what motivates students at our university to ask librarians for research assistance. We had been including more detailed information at the transaction level for the reference statistics using Springshare LibAnalytics. Not only did we map the patron's question to one or more of the six ACRL Information Literacy Frames, but we also began tracking when questions were specifically linked to library instruction sessions. Still, we realized that quantitative data was insufficient in providing an explanation about why students were asking for research assistance. In order to understand why we

are increasingly in demand, we realized we needed to collect qualitative data. We chose to reconnect with students who had asked us for research assistance and conducted semi-structured interviews with them. From these interviews, we learned more about their information seeking behavior and their motivations for seeking help.

We have speculated about the connection between reference transactions and other services such as library instruction; however, we had scant evidence about the impact of library instruction on reference interactions until we conducted the interviews. Furthermore, our interviews allowed us to look beyond our assumptions of why students sought help. This paper explains in detail the methodology of our qualitative study. Fellow librarians can use this model to conduct their own qualitative investigations in order to answer institutional questions that reference statistics cannot answer.

Literature Review

Very few papers on students' help-seeking behavior explore the reasons that students ask for help; instead, studies like Robinson and Reid use qualitative interviews to explore what prevents students from seeking a librarian's aid; they identified anxiety, fear of appearing foolish, or the notion that they would be bothering busy librarians as reasons students never make it to the reference desk.[1]

Other studies have aimed to determine whether students are more likely to ask librarians, faculty, or peers for help. Miller and Murillo discovered that many students were unfamiliar with librarians' research skills. Students shared that they were more likely to consult professors, who they had relationships with, instead of librarians, who they had limited interactions with.[2] Moreover, students were more likely to contact their friends and peers for help than librarians.[3]

Murphy's study of undergraduates' research behaviors revealed students were confident in their skills, preferring to conduct research on their own; additionally, Murphy's study supports Miller and Murillo's findings—when students need help, they are more likely to consult professors, friends, or family rather than librarians.[4]

The limited literature exploring the reasons that students ask librarians for help concludes that faculty referrals are crucial for getting students to consult librarians. Karen Sobel's study exploring why students asked librarians for help showed that the leading reason for students asking reference questions was not librarians promoting service during library instruction, but faculty referrals.[5] Pellegrino's study looked at the likelihood of students asking reference questions after receiving library instruction, and the results support Sobel's findings. She found that there was not a statistically significant connection between students asking reference questions because of library instruction sessions, but there was a statistically significant connection between faculty referrals and students' reference questions.[6]

These results should not discourage instruction librarians. According to Carol Perruso's four-year cohort study, students who received library instruction were three times more likely to seek assistance from librarians than students who did not receive instruction.[7]

Magi and Mardeusz have conducted the only qualitative research study exploring why students consulted a librarian. The study performed textual analysis of responses to open-ended questions distributed after research consultations; the most frequent reason for students to seek a librarian's help was a faculty referral, followed by students learning about reference services from library instruction.[8] Magi and Mardeusz restricted their research focus to students' motivations for seeking help, along with their experience of being assisted, and their preference for in-person assistance over online help.[9] Following in the path of other researchers, our study builds on their work using a different qualitative approach to explore how students search for information before asking for help and what motivates them to ask for help so we can better understand students' research needs.

Mizrachi's study revealed that while most students begin their research with public search engines, most will also use library resources such as the catalog or databases.[10] Similarly, Lee concluded that undergraduate students prefer to consult public search engines to begin their research.[11] The preference for public search engines does not provide students with the skills to navigate library databases, and Head discovered that nearly three-fourths of students encounter difficulties when choosing keywords and constructing effective

searches.[12] The research on students' information seeking behavior suggests that students will need assistance with their research.

Taken together, the literature on information seeking behavior and help-seeking behavior touch on similar themes that often overlap. When students are conducting research independently, they prefer the most convenient tools, such as public search engines. If students need help with research, they are more likely to consult course instructors or friends and their reluctance to consult librarians might be out of embarrassment, anxiety, or a misunderstanding of a librarian's role. The studies on help-seeking behavior indicate that librarians should forge partnerships with faculty in order to gain access to students via both library instruction and direct professor referrals.

Purpose

Our goal in conducting these semi-structured interviews was to shed light on students' information seeking behavior. Once we understood why they asked for help, we could begin to identify effective ways for us to reach more students. The present study aimed to answer these two research questions: (1) How do undergraduate students look for information? (2) What prompted the students to seek out help from a librarian?

Process

Formulating Interview Questions

In order to answer the above research questions, we would need to understand students' thought processes and the motivations behind their actions. Most surveys contain predetermined questions, and even open-ended surveys preclude the opportunity for researchers to ask follow-up questions. Interview questions were selected to guide the conversation to answer our research questions while allowing the interviewer to pursue interesting leads, and probing questions were crafted to clarify statements and dig deeper.

Selecting Participants and Conducting Interviews

We conducted 10 one-on-one interviews with undergraduate students and we felt the level of in-depth probing in each interview was preferred to hosting multiple small focus groups. We limited our study to 10 participants because research from Guest, Bunce, and Johnson suggests that most of the important themes are addressed within the first six interviews and that data saturation occurs within 12 participants of an applied thematic study.[13] We were able to interview an ethnically diverse group of students with a balance of majors within the undergraduate divisions. Every student who was given at least 20 minutes of in-person research assistance was asked if they wanted to participate in our study. We provided $20 Amazon gift cards as incentives for students to be interviewed.

We were able to conduct all 10 interviews within about six weeks of students receiving assistance from librarians. Our requests for interviews were successfully timed during a momentary lull for students near the end of fall semester—after research papers were completed but before final exams got underway.

The Interview Process

Because of concerns with students being reluctant to provide forthright responses to public services librarians who might assist them in the future, the assessment librarian conducted the interviews. One-on-one interviews were scheduled for one-hour blocks that were recorded and later transcribed. Students were asked a series of semi-structured questions that were organized into five sections comprised of a main question and probes designed to encourage students to elaborate on their responses (see Appendix 1).

The opening question asked the student to describe a "time in the past semester where you needed help locating information after trying to find the answer on your own." Probes inquired about which resources they searched, the physical location where they conducted research, and how long they searched before seeking help. Additional probes asked students to explain the context for the moment when they realized they needed help and why they sought help from a librarian.

The second set of questions switched gears by asking students to think about a time they utilized a librarian's help. Probes inquired about students' emotions before, during, and after the process, as well as describing the assistance the librarians provided. In addition, students were asked in hindsight if they would have changed anything about the approach they took. It was important to not ask leading questions such as, "What did you learn from the librarian?" because this question assumes that students learned new skills from the

librarian. What if the student felt that the librarians had not imparted any useful knowledge? To learn if students gleaned skills from their interacting with the librarian, our probe asked, "And now, let's think back again to what you observed in working with a librarian. Are there strategies or tools that the librarian used that you would want to try or use in the future?"

The third section of questions asked students to explain why they chose to specifically approach a librarian for help. Our follow-up question asked students to elaborate on the point they were at in the search process when they decided to go for help.

Our fourth segment (and last formal set of questions) asked the student to explain "any difficulties you may have encountered when asking a librarian for assistance." We wanted to know what barriers, if any, they experienced while seeking help. And finally, we concluded the interview by asking if they had anything else to add that we had not asked about.

We know reference questions have increased; these semi-structured in-depth interviews allowed us to explore students' thought processes and motivations that could explain "Why" reference questions have increased.

Data Analysis

We used the technique of applied thematic analysis because it helps qualitative researchers find meaning from the results of interviews or focus groups by applying codes and identifying important themes.[14] This was an ideal approach for organizing the data from our transcripts.

We used the transcribed interviews for our analysis. Each member of the research team read the transcripts and identified themes and recurring points or concepts; we made notes about our observations on paper index cards that we shared at meetings. Over the course of a few meetings we organized these 3x5 cards with our observations into groups representing larger categories relating to main research questions. These larger categories were subdivided into specific categories relating to the larger concepts—our piles of index cards became detailed brackets which we recorded on a whiteboard (see Appendix 2). These brackets helped identify our future codes, which we formally rendered into themes. The purpose of this process was to create a codebook that would be used to tag sections of our transcripts. The codes would identify sections of the transcripts to analyze for trends, patterns, and answers.

Once we had identified our codes, we were prepared to create a codebook; each member of the research team was responsible for writing definitions for the codes. This process required assigning a shorthand name, defining the code, and providing examples of when and when not to use the codes (see Appendix 3). We met to review each other's definitions in order to amend and approve codes. Once we ratified the codebook, we were prepared to begin coding the transcripts. We used NVivo, a software program which helps organize coded text, retrieve relevant quotes, and identify code frequencies. One team member was designated the primary coder, and their work was passed to the other members who could ratify, question, or amend coding decisions. Finally, the primary coder finalized the coding with updates and changes. This collaborative process allowed us to reach complete intercoder agreement.

What did all these codes tell us? NVivo allowed us to see all the sections tagged with the same codes across all the interviews. For example, the WRKWLIB (working with librarian) code was applied to sections of the transcripts in which students discussed "skills students learned from working with librarians." NVivo allowed us to look at all the quotes relating to a particular code; this made it easy to see trends by identifying key points that repeated throughout interviews.

Using codes to analyze semi-structured interviews revealed information we could not have gleaned from a survey. For example, we were interested in knowing if students experienced difficulty contacting librarians—perhaps we were unapproachable or our contact information was difficult to find. To uncover real or perceived barriers, we asked the students toward the end of the interview, "Can you talk about any difficulties you may have encountered when asking a librarian for assistance?" While none of the students identified difficulties, our code "Assume"—which we applied to places in the transcripts where students have made assumptions about library services—allowed us to tag a research hurdle for students. Earlier in the interview process, when we asked students to tell us about their experience seeking a librarian's help, some students discussed self-imposed restrictions they placed on utilizing help from librarians. A few students felt there were

limits to how many questions they could ask, and some decided they would "save" reference questions for upcoming assignments the way a football coach strategically saves time-outs to be used at the most opportune point in the game. We coded examples of preventing students from utilizing librarians as "Assume." Our analysis was able to uncover self-imposed barriers based on personal perceptions; these "question quotas" would have been missed by survey questions because we could not have anticipated a way to craft a question that would give us answers we did not even know existed.

Our codebook contained 33 codes that we applied to all of the transcripts. When we began working on the codebook, we identified some broad categories; however, after coding all of the interviews we had a much better idea of the themes we should use to make sense of our findings. We identified six themes that made it much easier to organize our findings and discuss the data:

1. How students research
2. Perceptions of their research skills
3. Assumptions held, both about the library and the process of searching for information
4. Motivation for asking for help
5. Path to the librarian
6. Experience working with a librarian

Takeaways

Our study revealed a lot about our students' research habits and help-seeking behavior. A few key discoveries include:

- Library instruction was a strong motivation for students to ask librarians for help. In the interviews, students mentioned that the librarian encouraged them to ask for help if they needed assistance.
- Referrals from professors were also a strong motivation for students to ask librarians for help. Students who visited a librarian because of a professor's referral did so for a few reasons:
  - Some understood from assignment instructions that the professor's expectation was that they take questions to the librarian, so they followed these instructions.
  - Others had a rapport and respect for professors that motivated them to follow faculty recommendations to seek help from librarians.
- As previously discussed, many students have a self-imposed rule about how much help they can seek from librarians.
- All 10 students expressed a strong preference for a "do-it-yourself"(DIY) approach to research.
  - This desire stemmed from a preference to take ownership of their research and not wanting to appear lazy.
  - Some students indicated that they would need to research on their own after graduating, and they needed to hone their skills independently.
  - Despite this DIY preference, students were willing to seek help when they encountered a challenging research question that took what they considered to be an unreasonable amount of time. Students mentioned spending from 30 minutes to several weeks conducting research independently, with a couple of hours being the average before seeking help.
  - In addition to devoting considerable time on difficult research questions, students also expressed negative emotions such as stress or frustration prior to asking a librarian for help. Students were particularly frustrated when they were searching for information that they knew existed, but were unable to locate.
- Students preferred the ease of typing keywords into Google, but they struggled to effectively search library databases. Librarians were instrumental in helping students select effective search terms, use the advanced search features, and narrow down their topics.
- Students understood the importance of locating credible sources, but they experienced trouble locating them. These limitations with the students' research skills required the assistance of librarians.
- Every student was satisfied with the help they received and indicated they would ask librarians for help with future assignments. Students showed an interest in learning more about the strategies the librarian employed during their session in order to utilize those skills with future assignments.

Value to Other Librarians and Ideas for Further Exploration

Because of students' DIY mentality, librarians must identify the most effective methods for promoting reference services. Our research highlights the importance of forging partnerships with faculty. Strong relationships with faculty will provide more opportunities for library classroom instruction and

referrals from professors. Classroom instruction is a great forum for librarians to dispel myths about library services such as "quotas" on the number of questions students can ask librarians. Moreover, librarians can let students know that they can save a lot of time with their research by scheduling consultations.

This qualitative study gave a glimpse into student's minds so we could begin to understand why they do what they do. By mining the rich data from their own qualitative studies, librarians will be able to answer their own institutional questions.

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Appendix I. Interview Questions

1. I'd like you to think back to a time in the past semester when you needed help locating information after trying to find the answer on your own. Please talk about this experience.
    a. Was it for an assignment or something you were trying to learn more about on your own? What was it you were trying to find? How did you go about looking for the information? What did you try? Where did you look? Where were you (e.g., in your dorm, the cafe, the library)? How long did you keep trying to find information before thinking that you might need to ask someone else?
    b. Thank you for giving such a good context about the information you were trying to locate. I'd like you to talk now a bit about that moment when you realized you would need help.
        i. Can you compare how you felt to another time that you felt the same way?
    c. Thanks for talking about that. Now I'd like to learn more about your thought process when seeking out help from someone else. What made you seek out the person who helped you find your answer or think through your problem?

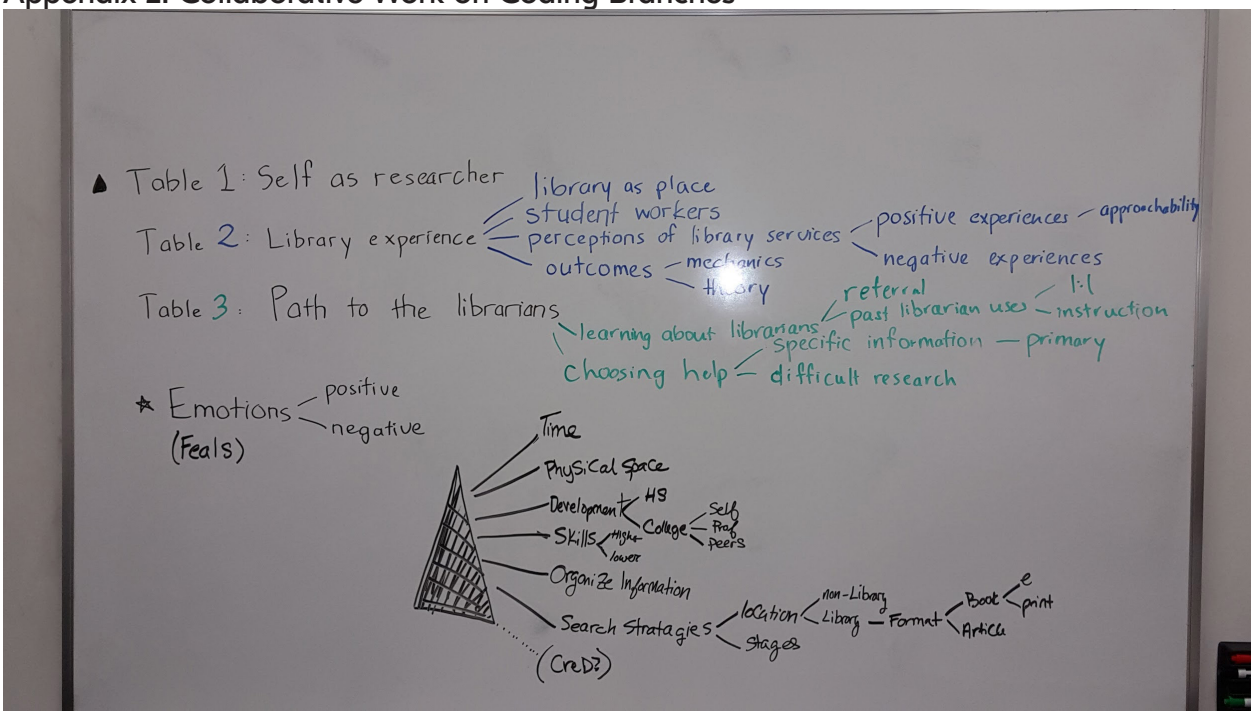
2. It's been helpful for me to hear about the context in which you found yourself needing help locating information. We're going to switch gears and focus now on a time when you utilized the help of a librarian. Please tell us about this experience.
    a. How did you know who to contact in the library? How did you know where to go to ask for help?
    b. Thanks. Can you describe for me what the librarian did when you asked for help?
    c. I'd like you to think about how you felt while being assisted. And now I would like you to tell me how you felt when you were finished.
    d. Is there a certain context in which you would find yourself asking for help from a librarian in the future?
    e. With hindsight, if you had it to do over again, tell us how you would look for information for this assignment/question?
    f. And now, let's think back again to what you observed in working with a librarian. Are there strategies or tools that the librarian used that you would want to try or use in the future? If yes, please explain.

3. Thanks for talking about your experience with the librarian. I'd like you to think about why you contacted a librarian for help.
    a. What point in your search did you contact the librarian?

4. I appreciate all the thinking back to your experience with the librarian and the context for reaching out to a librarian. I have one final question about this interaction with the librarian. Can you talk about any difficulties you may have encountered when asking a librarian for assistance?
    a. Tell us how librarians can be more approachable.

5. You've been so helpful in talking with me today. I'd like to ask if there's anything you would like to add.

Appendix 2. Collaborative Work on Coding Branches



Appendix 3. Example of a code from our codebook

Code Name	TIME (CM) -AGREED on 05.11.16
Brief Definition	time spent doing research
Full Definition	describes quantity and/or the quality of the time period(s) allotted to doing research; time spent devoted that relates to doing research for a college assignment, including the time spent with a librarian
When to Use	whenever a student quantifies the amount of time (e.g., two weeks, three hours) whenever a student generalizes the amount of time (e.g., a long time) whenever the student describes productivity of the time (e.g., wasted my time)
When Not to Use	as it relates to hypothetical of what another student would or would not spend time doing for research "I don't have the time to go in and sit down for an hour or whatever" [referencing the friend of the interviewee who discussed feelings about meeting with a librarian] [00:00 110915(2)]
Example/Quote	"I don't know exactly how long, but I'd say… a couple of hours" [07:00 110915(1)] "I searched for a long time on my own and I just shouldn't have wasted that time." [25:00 110915(1)]

There is a Method to the Madness: Understanding the Benefits and the Usage of Usability Methodologies in a Website Life Cycle

Rachael Winterling
University of North Carolina at Charlotte, USA

Introduction

The University of North Carolina at Charlotte's (UNC Charlotte) J. Murrey Atkins Library (Atkins) is an academic research library that supports more than 29,000 students, faculty members, alumni, and community borrowers. Atkins is the center of intellectual life for the university; therefore, its role is to provide users with tools and services that will encourage and support their academic endeavors. A library website is an essential gateway to provide information and services to its users; therefore, a site must be efficient, effective, easy to learn, error tolerant, and engaging. Libraries must constantly analyze their websites to stay up-to-date on emerging technologies, tools, services, and user needs.

The usability coordinator conducted several usability methodologies to test, influence, and support the redesign of the website's homepage, navigation, and secondary pages. Four types of usability testing (exploratory, assessment, comparison, and validation) were referred to as the usability coordinator planned and executed the different methodologies throughout the website redesign development cycle. The usability methodologies utilized included card sorting, tasks-based testing, focus groups, first click testing, surveys, and heuristic evaluations. Each methodology produced quantitative and qualitative data to support recommendations to ensure efficiency, functionality, and desirability of the website. In addition, data analytics and visualization tools such as Google Analytics, HTML_CodeSniffer, Optimal Workshop, and Tableau were utilized to support the quantitative and qualitative data. Four different audiences (teaching faculty, library staff, graduate students, and undergraduate students) participated in the different methodologies of the study.

Background

Atkins has had several full website redesigns as well as three homepage redesigns. A new dean of J. Murrey Atkins was hired in summer 2015, and one of her first initiatives was to analyze and update the website. To start the discussion, Atkins reinstated the Web Advisory Group (WAG), which includes volunteers from every library department to discuss the website changes and other web-related information.

Atkins decided a website redesign would be the most beneficial option. The redesign of the website was decided for two reasons, those being that the site platform needed to be migrated from Drupal 6 to Drupal 7 and that prior usability studies and evaluations on the site recommended updates and changes to the site's content and design.

In the fall of 2014, Atkins performed a usability study of the website with its main focus on the homepage. The study utilized the following methodologies and tools: tasks-based testing, focus groups, paper prototyping, Google Analytics, and HTML_CodeSniffer. Qualitative and needs-based data were gathered from the tasks-based testing, paper prototyping, and focus groups, quantitative data was gathered from Google Analytics, and accessibility issues were gathered from HTML_CodeSniffer. The study recommendations that supported the redesign are the following: add a rotating banner to the homepage; consistently label features throughout the website; turn off the old mobile site; redirect the old group study application to the new group study application; reevaluate current navigation menu item labels. Then, in summer 2015, a website audit was conducted that uncovered hundreds of unpublished webpages as well as hundreds of hidden webpages that could still be accessed through Google site searches but not through the homepage, secondary pages, or the navigation. The hidden/unpublished pages mainly included duplicate information from accessible published webpages. With the recommendations from the usability study and the findings of the audit, Atkins decided that a full redesign would be more efficient than a migration.

Redesign Planning and Preparation

After the decision was made to redesign the website, WAG began a one-year journey to redesign the website. The goal of the redesign was to create a patron-centered website that can sustain minor changes as Atkins introduces new services and as new technologies emerge. The usability coordinator used the data from previous usability studies, a website audit, a heuristic evaluation, and Google Analytics to initiate the planning process. In addition, WAG meetings were treated as internal focus groups to discuss usability findings, the redesign process, and website desires. The usability coordinator collaborated with WAG and the library's Graphic Designer/Software Developer throughout the study's planning and execution. The usability coordinator gave updates throughout the study, presented on findings for each methodology, and gave recommendations for next steps. Before any usability methods began, the usability coordinator researched the UNC system and UNC Charlotte's peer institutions' library websites, as well as analyzed Google Analytics, to analyze the top hit webpages and the least hit pages. This allowed the usability coordinator and the graphic designer/web developer to produce several homepage mock-ups. In addition, the usability coordinator identified redundant items on the homepage and homepage items that were not located in the navigation on the current library website. A plan was developed to successfully complete the website redesign: homepage mockups, navigation, secondary page layout, content gathering, quality assurance, and tasks-based testing.

Navigation

The usability coordinator started the redesign study with a focus on the navigation. A navigation is the map of a website; if it is not usable, users will not access desired content easily. The fall 2014 homepage usability study recommended evaluating the labels of the current navigation menu items to improve and support an effective, efficient, engaging, error tolerant, and easy to learn website for users. The goal of a label is to communicate information efficiently. To determine navigational items and subitems, the card sorting methodology was planned and utilized. Card sorting is a method used to help design or evaluate the information architecture of a site. In a card sorting session, participants organize topics into categories that make sense to them, and they may also help with labeling these groups. Card sorting helps researchers organize information from the user perspective. Three types of card sorting can be utilized: open sort, closed sort, and hybrid sort. A closed sort provides participants with predefined top-level categories, an open sort requires participants to label top-level categories, and a hybrid sort has predefined top-level categories as well as an option to create and label categories.

The usability coordinator used Optimal Workshop's "Optimal Sort," a digital card-sorting tool. The tool analyzes the results and produces standardization grids, similarity matrixes, and dendrograms. Teaching faculty, library employees, graduate students, and undergraduate students partook in the website redesign card sorting methodology. The participants first completed an open sort with thirty cards, and then completed a hybrid sort that utilized four predefined categories (*research help*, *services*, *about*, *library spaces*) and the same thirty cards from the open sort. The 31 participants' hybrid and open sorts were compared and analyzed. The results were visualized in Tableau to showcase the common card groupings and category names. The visualized data was presented at WAG to support a recommended top-level navigation. After the top-level navigation was discussed and approved by the group, the usability coordinator recommended subcategories to organize the large amount of items listed under each top-level category. After the navigation was finalized, a responsibility sheet was created to delegate content for secondary pages to subject matter experts. After content was created, it was transferred into a Drupal 7 sandbox to be tested before the hard launch.

For You Survey

When the homepage and navigation were being researched and discussed, "for you" user groupings were popular. WAG (internal focus groups) made the decision to include a "for you" category on the homepage and within the navigation. The usability coordinator took advantage of the WAG members and developed a survey that asked members to list information that should be listed under the following audiences: undergraduate students, graduate students, faculty and staff, alumni and retirees, and community borrowers. A list for each audience was aggregated and shared at the next WAG meeting to discuss and review. After the list for each audience was finalized, a responsibility sheet was created to delegate content for secondary pages to subject matter experts.

Quality Assurance
In the summer of 2016, Atkins' Usability Lab conducted a quality assurance (QA) study of the website redesign prior to the July 1, 2016 hard launch. Atkins'website plays a primary role for its services to its audience. The study included an assessment of the site, an analysis of tasks-based testing, an employee feedback survey, and an HTML_CodeSniffer homepage report to identify errors prior to the redesign's hard launch. The objectives for the website redesign QA report were as follows: conduct a usability assessment of the redesign, identify content errors prior to the hard launch, and conduct analysis of the design and functionality of the redesign. The study identified issues that were addressed by members of the Technology and Digital Strategies Department prior to the hard launch to ensure the interface's functionality.

Study Design
The study included an assessment of the site, an analysis of tasks-based testing, an employee feedback survey, and HTML_CodeSniffer to identify errors that affect the functionality of the interface prior to the hard launch.

Redesign Assessment
Usability best practices were incorporated to complete the assessment. Members of the assessment team and the Digital and Technology Strategies Department reviewed the site for content errors, broken links, and functionality. The assessment identified several opportunities to improve the redesign that would result in a more efficient, effective, and desirable web interface.

Tasks-Based Testing
The study utilized tasks-based usability testing, an approach that relies on representative user groups' attempts to perform relevant tasks to uncover design and functional issues with the interface. The tasks-based testing consisted of 30 participants that represented nine undergraduate students, three graduate students, ten library employees, three teaching faculty, and five Atkins Fellows.

The study utilized three tasks lists to accommodate the needs of the different participant groups. This approach allowed the researcher to compare data across common benchmarks based on the participant groups' ability to complete each task. Participants' performances as they attempted to complete the tasks exposed usability issues and informed recommendations. During the test session, participants were encouraged to articulate their thoughts and actions aloud as they worked through the tasks. The think-aloud protocol allowed researchers to understand the context for user actions and decisions while completing a specific task, making it easier for the researchers to determine the underlying causes of usability issues. In addition to the task list, participants completed a pretest survey. The pretest survey captured demographic information, including year in school, major/field of study, frequency of catalog use, and an explanation of use. The posttest survey captured participants' thoughts about the kiosk. The test sessions were conducted on a Dell desktop computer running Morae Recorder. Morae Recorder captures the desktop activities and the participants' facial expressions via a web camera. The test sessions ranged from 15–30 minutes and involved the test facilitator, a note taker, and the participant. The usability coordinator acted as the facilitator. The facilitator greeted participants upon arrival, guided participants through the informed consent, presented the participants with the tasks, answered participants' questions, and prompted the participants for responses. The assessment assistant and assessment fellow acted as note takers.

Participants were recruited through e-mail and posters throughout the building. The e-mails included the purpose of the testing, the testing timeframe, the participation incentives, and contact information. The 30 participants read and signed an informed consent form to participate in the test session. The university's Institutional Review Board approved the consent form. Student participants were incentivized with a $5 Starbucks gift card for their participation. Student participants received the incentive regardless of whether they completed the session or not.

Employee Feedback Survey
A feedback survey was shared with the entire library to gather content errors, broken links, design errors, and general commentary about the redesign. The survey asked participants to provide his/her department, length of employment, current website usage, bookmarked secondary pages, broken links, and content errors on the redesign, as well as general feedback on the redesign.

HTML_CodeSniffer
HTML_Code Sniffer detects accessibility violations and potential violations on behalf of W3C's Web Content Accessibility Guidelines (WCAG) and the US Section 508 regulation. HTML_CodeSniffer is a client-side script that checks HTML source code and detects violations of a defined coding standard. The US Section 508 regulation standards define the types of technology covered and set forth provisions that establish a minimum level of technology and information based on access guidelines developed by the Web Accessibility Initiative of the World Wide Web Consortium. The standards aim to ensure that information, like website graphics or animation, is also available in an accessible format.

WCAG is a wide range of recommendations for making web content more accessible. Content will be more accessible to a wider range of disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of these. These guidelines cover a range of issues, but they are not able to address the needs of people with all types, degrees, and combinations of disabilities. In addition, WCAG's guidelines make web content more usable by older individuals with changing abilities due to aging and often improve usability for users in general.

Findings

Findings were found through an assessment of the site, an analysis of tasks-based testing, an employee feedback survey, and an HTML_CodeSniffer homepage report. The findings were shared with the Technology and Digital Strategies Department as they were discovered. The type of error organized the findings: broken links, content errors, design and layout errors, inconsistent labeling, accessibility issues, and user suggestions.

Broken links are a connection in an HTML document to a URL that is not working properly, especially because it goes to a web page that is no longer available or which has moved to another server. Content errors provide users with misleading information. Inconsistent labeling identified throughout the redesign highlights services that are labeled in more than one way. Design and layout errors highlight organization, hierarchy, readability, and functionality of the redesign. Accessibility issues findings are based on the data produced by the HTML_CodeSniffer on the homepage redesign. HTML_Code Sniffer detects accessibility violations and potential violations on behalf of WCAG and the US Section 508 regulation. Participants gave user recommendations during and from observations of the tasks-based testing sessions or in the employee feedback survey.

Hard Launch

After the hard launch, testing of specific sections of the website began. First, the Special Collections and University Archives website was analyzed because its content is more than a single web page. After the Special Collections and University Archives website was tested, it was tested with the adult and evening services audience. The task list was identical to the task list used in the quality assurance phase; this allowed researchers to analyze the differences between phases. Testing will continue iteratively to ensure the efficiency, functionality, and desirability of the website.

Assessment by Design: A Design Thinking Project at University of Washington Libraries

Linda Garcia
Washington State University Vancouver, USA

Jackie Belanger, John Danneker, Mia Klaus, Christine Tawatao, Stephen Weber, and Linda Whang
University of Washington, USA

Abstract

Design thinking is a user-centered approach to the development of services and spaces that is increasingly being used in public and academic libraries. It is a valuable approach for libraries for two key reasons: firstly, the emphasis on ongoing engagement with users through a variety of qualitative methods (interviewing, observation, etc.) places the focus continually on user experience within and beyond the library; secondly, the use of that feedback in an iterative process of rapid design, prototyping, and reassessment means that this approach can help libraries be more nimble and responsive to user needs. Design thinking's emphasis on iteration—in which feedback is gathered from users at each stage of the process of creating new services and resources—can be a valuable complement to larger scale assessment projects. This paper discusses how design thinking was applied in a 2015–2016 project at the Odegaard Undergraduate Library at the University of Washington. This pilot project focused on identifying challenges faced by transfer students at the University of Washington and was also designed to help the team better understand how this approach might be rolled out more widely as part of an overall assessment program. This paper will discuss what the project team learned (successes and failures) from implementing this project and provide tips for the effective use of this method in academic libraries.

Introduction

This paper presents a brief discussion of recent assessment work focused on transfer students at the University of Washington (UW) Seattle campus. A small team of librarians, graduate students, and staff members in the Odegaard Undergraduate Library employed a design thinking approach in order to explore some of the challenges faced by transfer students at this large state institution and to identify ways in which UW Libraries might better support this population of students. The paper discusses the benefits of design thinking for understanding student needs, highlights lessons learned by the project team about design thinking, and provides tips on using this approach in academic libraries.[1]

What is design thinking, and why did we use this approach?

Design thinking is a user-centered approach to the development of services and spaces that is valuable for libraries for two key reasons: firstly, the emphasis on direct, ongoing engagement with users through a variety of qualitative methods such as interviews and observation places the focus continuously on user experience; secondly, the use of feedback in an iterative process of design, prototyping, and reassessment means that this approach can help libraries be more responsive to user needs. Design thinking is a mindset that emphasizes developing empathy with users and attempting to see the world through their eyes. This mindset is critical for libraries to understand the challenges students face in their academic lives and to develop ways for libraries to meet user needs in potentially new and creative ways.

The UW Libraries team based its work on the processes outlined in the *Design Thinking for Libraries Toolkit*. The toolkit, which emerged out of a collaboration between design thinking firm IDEO and the Chicago and Aarhus (Denmark) Public Libraries, provides libraries with a guide to the key stages of design thinking: ideation, iteration, and implementation.[2] Ideation involves

learning about a target user population (in our case, transfer students) and brainstorming ideas about how services, resources, and/or spaces can be developed or changed to meet their needs. The iteration stage involves creating a prototype of a service, gathering user feedback on the prototype, and making changes to the original idea as needed. During the implementation phase, the new service is piloted with a larger group, feedback is gathered, and additional changes made. The process is intended to be relatively rapid in order to enable organizations to be nimble in developing, testing, and revising services to meet emergent needs.

UW Libraries staff were interested in design thinking as a way to gain a more holistic perspective on transfer student experiences and to learn how we might fit the libraries more seamlessly into their lives. We were also interested in design thinking as an approach that could expand the UW Libraries assessment toolkit and enable us to respond more quickly to user needs. The UW Libraries has a strong track record of effectively using methods such as large-scale user surveys, as well as smaller-scale qualitative approaches, to gather user feedback for improvement. However, many of these activities often take a significant amount of lead time to implement, to analyze and communicate the data, and then to act on the results. An approach in which agility is key—in which we could potentially implement new services or tweak existing ones within the space of months—was a driving factor in the decision to pilot design thinking. Going forward, design thinking will be a key part of the UW Libraries assessment program, as it will enable staff to follow up more quickly on data gathered through other methods such as surveys.

Piloting design thinking at UW Libraries: what we did and what we learned

The project team decided that design thinking would be ideal for gaining a better understanding of some of the challenges transfer students face in moving to a research university from smaller community college settings. Throughout the various stages of the 11-month project, the team held interviews and group discussions with a total of eight transfer students and four university staff members. In keeping with the iterative nature of design thinking, six of these student and staff participants were consulted at multiple points in the process. In addition, follow-up surveys were sent to students who attended a series of events that were implemented in the final stage of the project. The project focused on transfer students at the Seattle campus, the largest of the three campuses in the UW system.

For the pilot project at UW Libraries, the ideation stage involved two steps: the first involved a literature review and an exploration of existing UW institutional and libraries data on transfer students. This data, and the general literature on transfer student experiences at large research institutions, provided an important big-picture context for our understanding of transfer students. Based on the questions that emerged from this initial literature and data review, the project team then conducted seven interviews, four with transfer students and three with staff from the First Year Programs Office, the Office of Minority Affairs and Diversity, and the Admissions Office. We chose not to focus our questions specifically on the libraries, but instead on broader issues faced by these students (culture shock, work-life balance, connecting to resources on campus). In doing so, the project team hoped to see if there were ways that the libraries could address needs in users' workflows or lives that might not be immediately obvious if we had just asked about existing libraries services or resources. The second step of the ideation stage involved identifying key themes relating to the challenges experienced by some UW transfer students based on institutional data, literature, and our interviews. Key themes that emerged included:

- Transfer students wished to be acknowledged institutionally as a distinct group from other first-year students. Transfer students at UW Seattle are often older and may have job and family responsibilities that they perceive other first-year undergraduate students as not having. Students expressed resistance to the idea of being included with other (younger) first-year students in orientation activities, for example.
- Students identified two key challenges they faced in transferring to UW Seattle: (1) difficulty in finding community; and (2) the need to "hit the ground running": while other first-years have four or more years to learn about campus resources and services, transfer students felt that they did not have the luxury of time to identify sources of support. Students expressed a need for opportunities to learn about the campus early in their time at UW (ideally, at transfer-student-specific orientations) and in flexible ways (via online information, for example). However, because the institutional focus on

transfer students was relatively new at UW Seattle, information for transfer students existed in multiple places, often making it difficult for students to find the information they needed in a timely manner.
- Our project was centered on the Odegaard Undergraduate Library, but initial interviews revealed that students preferred quieter spaces within the libraries, and often associated the undergraduate library with first-year students who were perhaps less studious and who had more time to socialize.
- Transfer students often entered their majors without taking a 100-level class that would have provided them with an introduction to UW Libraries services and resources.

As a last step in the ideation process, the team then brainstormed possible ways to address these challenges. The team decided to create a library-hosted panel and social event for transfer students that would involve more experienced transfer students sharing their experiences with new transfers.

Once the team decided on this event, we moved to the iteration stage of the process, which involved developing and testing a prototype of our idea. As the team was developing a prototype, we learned that a similar event was being hosted by a different group on campus. Team members decided to treat this event as their prototype and so attended it in order to observe who participated and to gauge the level of interest among transfer students. Only one student attended the event, leading the team to conclude that this might not be the most effective solution to meeting student needs. Team members then returned to students and staff for a group discussion, which was held at a meeting of the campus transfer student organization and which was attended by six students and two First Year Program staff members (two of the students in attendance and both staff members had been previously interviewed in the initial stages of the project) in order to get their perspective on why the event was not successful. Students indicated that the timing of the event was critical, as was the direct relevance of the material to their major: students noted that they wanted all information included in transfer student orientations, as this was the best time for them to gain introductions to important support services on campus, rather than at a later point in the academic term.

The team then entered the iteration/implementation phase, which involved returning to our original idea and deciding how to make changes based on user feedback from the prototype event. We revisited our initial data and interviews and our observations and student/staff feedback on the prototype, and decided to revise the original idea: while we would still have an event, it would be integrated into existing orientation events for transfer students (rather than an independent, separate library-hosted event) and would feature a more departmental-specific focus. The libraries also decided to partner more closely with the First Year Programs Office and the Undergraduate Research Program on these events, gaining feedback from these partners once we had generated new proposals.

In fall of 2016, the libraries, in partnership with these units, piloted a series of new events designed to support transfer students. These included:
- Library orientations and tours designed specifically for transfer students (rather than orientations that included both transfers and other first-year students). Tours were developed in response to the lack of awareness transfer students expressed about the library support available to them, and the fact that many students might not receive formal library instruction if they did not take either a 100-level or a Transfer First Year Interest Group course. The library tours, which were attended by 41 students in fall 2016, introduced transfer students not only to the Odegaard Undergraduate Library but also to a range of other library services and to spaces that are well-suited to quiet, individual study.
- A transfer student social with departmental librarians and advisors, developed in partnership with the Undergraduate Research Program. The social, held in the Undergraduate Library and attended by over 45 students, provided transfers with an opportunity to meet other transfer students, subject librarians, and departmental advisors. While this event was in many ways similar to the team's original idea, the critical difference was that it was held in conjunction with the Undergraduate Research Program's panel presentation on research opportunities for transfer students.
- Children's Story Time for transfer students and their children, developed in partnership with First Year Programs and the Student Parent Resource Center. This was designed with transfer students with families in mind. The

event was not well attended, and library staff are considering whether it should be modified or offered again.

Feedback on these events was gathered in the form of surveys, which are currently being analyzed to assess what worked and what might be changed. In addition, the project team presented its results to liaison librarians and has hosted a transfer student panel for library staff. This panel enabled librarians to hear directly from transfer students about their experiences and the support they need in their majors.

Over the next year, staff in Odegaard Undergraduate Library will continue to assess the new events for transfer students and will also be working closely with campus partners to explore other areas of support for transfer students:

- The first year experience librarian will partner with staff in First Year Programs and other units to ensure that online information for students is collected in one place and that students are aware of this resource.
- The first year experience librarian will explore connecting with students outside the libraries in a newly revamped space in the student union building called the "Commuter and Transfer Commons." This space, which is designed to give commuter and transfer students a central, dedicated place for connecting with others, also offers librarians the opportunity for outreach and promotion of library services and resources.
- Project team members will also create a new user persona representing transfer students, to assist library staff in keeping the needs of these students in mind when designing and marketing library services.

As a result of this work, UW Libraries staff now have a better understanding of transfer student needs and stronger relationships with transfer students and other campus staff who support them. The design thinking method itself has yielded important dividends in terms of increased connection with students and staff. The "high touch" approach inherent in design thinking was critical for establishing these connections and developing a deeper understanding of the transfer student experience. The transfer students we spoke to reported that they struggled to find a sense of connection and community in coming to such a large institution. The personal, empathetic, continuous dialogue approach to learning about their needs produced unexpected dividends, and students repeatedly expressed their gratitude that librarians were taking an interest in them as a distinct group of students.

There are obvious limitations to the team's approach to understanding transfer student needs. This was a small pilot project designed to gain insights into transfer student needs at the UW Seattle campus and to explore the potential of design thinking methodology. The project was based on feedback from a small sample of a total of twelve participants, and the results are not intended to be generalizable to other institutions. However, one of the key benefits of design thinking is that it is structured to address the question of sample size and representativeness: while the team interviewed only four students and three staff at the start of the project, the continuous engagement with users at later stages of the project (returning to six of the original interviewees and gaining insight from six new participants at later stages) provided a variety of user perspectives and opportunities to assess if our ideas were viable.

Tips on using design thinking in your library

The *Design Thinking for Libraries Toolkit* provides a detailed guide to best practices for undertaking design thinking projects. Based on our experience, the UW Libraries team can offer additional details (and some modifications) on those tips and best practices:

- **Utilize a small, core project team and draw on others as needed:** The Libraries' project drew upon a core six-person group who were able to bring diverse skill sets and perspectives to the process: we had a mix of librarians from different units, staff, and graduate students as part of the team. Because we were looking to understand transfer student support and user needs assessment from a fresh perspective, having this diverse group of people was key. Six people was an ideal size for the team; this was enough to divide up the work over the course of the project, but small enough so that we did not face significant scheduling challenges for the weekly team meeting. Beyond this core group, we also had smaller pop-up teams who assisted us with different aspects of the project. For example, three other librarians and graduate students assisted us with notetaking during interviews. This helped to distribute

the workload and give others experience in the process, while helping the core team keep up momentum.

- **Gain administrative buy-in early in the process:** The support of the director of Odegaard Undergraduate Library was critical to the success of this project. This was essential not only because of the need for staff resources and time dedicated to the project, but also because it signaled a willingness to experiment with new approaches and ideas, not all of which would succeed. Administrative support for experimentation, creativity, and even failure was crucial in enabling the project team to realize the full potential of design thinking.
- **Pay attention to meeting and space logistics:** Frequent, regularly scheduled meetings are essential to keep up project momentum. The process is not necessarily intended to be long in duration, but there is a significant investment of time of a few hours per week for each team member during that period. Scheduling all team meetings ahead of time for the duration of the project was essential to move the process forward, even though our project did take longer than expected (more on this below). On a related note, a dedicated space for team meetings and materials, as recommended in the *Design Thinking for Libraries Toolkit*, enabled the team to keep brainstorming materials in view during our meetings. This made it significantly easier to return to those materials continually over the course of the project. This was especially important when the initial event prototype did not succeed: because the team had tracked ideas at all stages of the process and those steps were clearly visible, we were able to return quickly to the challenges we identified and the range of solutions we had previously brainstormed.
- **The mindset with which your team approaches this work is key:** Our project was dependent on team members' willingness to be flexible and open to failure. As this was a pilot, for example, it took us longer than expected to get through all stages of the project (11 months from start to the implementation of new events in fall 2016). In part, this was because team members undertook this project in addition to their regular responsibilities, and also because collaboration with partners outside the libraries can take a significant investment of time at such a large, decentralized institution like UW. The *Design Thinking for Libraries Toolkit* recommends that libraries have dedicated staff time granted to a team for this process. Realistically, however, this was not possible for us, nor is it a possibility for all libraries. It took some time for the project team to become comfortable with the idea that we needed to adapt the design thinking process to our own institutional context, and we would encourage others to be open to this possibility from the start and to be flexible about modifying the approach as needed. Flexibility was also crucial when it came time for us to prototype our idea for an event. In design thinking, the prototype can be informal—a mock-up of an idea that can help to make it more concrete in order to get user feedback. Rather than create our own prototype, we were able to use another, very similar event as an opportunity to gain user feedback on the viability of our idea. While this will not always be an option, actively seeking out these opportunities has the potential to save project teams (and their users) significant time and effort.
- **Be up front with colleagues about what design thinking is (and isn't)**: As the project team shared results and ideas for services and resources for transfer students with colleagues, we realized that we needed to spend more time explaining what design thinking is and how it fits into an overall assessment picture. While design thinking draws on traditional assessment methods such as interviews and observations, the relatively rapid and iterative nature of the approach looked different than the assessment and user experience work that was familiar to some staff. The sample size for the pilot project was small, as it can generally be for design thinking projects, but user feedback was gathered from different groups of users at multiple points in the process. In future, the team will foreground the question of sample size and process in particular so staff will understand both the strengths and limitations of the process. In addition, we will stress the usefulness of design thinking as one part of an overall assessment toolkit, one that can be effectively used in conjunction with other methods such as surveys.
- **Keep your strategic plan in view:** The project team learned a great deal about transfer student challenges and needs more broadly by not focusing specifically on the libraries. However, this also meant that it was easy to lose sight of what was actually within the UW Libraries' scope in terms of meeting some of the broader

needs we identified. We found that it was important to use the UW Libraries' strategic plan as a roadmap for making choices about where to focus in developing new services and resources for those students. Continually asking questions about what is within the library's scope, and what might be best for other partners to address (either on their own or in collaboration with the library) can help ensure that project teams do not lose focus on what their libraries can and should be doing for users. The information gained about user needs in this work can also be used to inform potentially new areas of focus in the next iteration of a strategic plan.

- **Treat the process as an opportunity to build partnerships:** The process itself provided the project team with an opportunity to solidify strategic institutional partnerships and resulted in increased collaboration with the Office of First Year Programs and Undergraduate Research on targeted resources and services for transfer students. Gathering input from staff in these other UW units during the course of the project highlighted areas where we could collaborate more effectively in both the short and long term.

Conclusion and next steps

As a result of piloting design thinking at UW Libraries, we now have a set of services in place for transfer students that we will continue to assess as they are rolled out in the 2016–17 academic year. Library staff is also currently planning on running design thinking projects in winter/spring 2017 to follow up on results from our triennial survey for faculty and students. This will involve training additional library staff members in the design thinking approach, which will help to build capacity for this work across the library system. In the longer term, the UW team is considering how we might embed design thinking meaningfully into a sustainable, ongoing practice. While it is certainly a useful part of an assessment toolkit, the true strength of design thinking is as a mindset in which organizations embrace continuous learning, nimbleness, and innovation in order to deliver the best possible support to our users.

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Using Informal Learning Spaces and Non-Traditional Methods to Assess Student Success

Sojourna Cunningham
University of Richmond, USA

Anna Sandelli
University of Tennessee, Knoxville, USA

Abstract

"Student success" and the "user experience" are terms that have increasingly gained prominence in conversations around assessment and student support. Understanding these terms not only involves fostering dialogue among librarians and administrators, but also incorporating and prioritizing student voices into discussions surrounding academic libraries and their contributions to the university community. In 2015, in an effort to incorporate student voices into this ongoing conversation, librarians at the University of Tennessee, Knoxville (UTK) began a longitudinal ethnographic whiteboard study. The study utilized whiteboards to examine the role of the library as a learning community and to investigate how students' experiences, habits, interests, and preferences, both within the library and throughout campus, create and inform this learning community. This lightning talk will summarize and report on the methods of the 2015 ethnographic whiteboard study conducted at UTK, as well as a subsequent iteration of the study conducted in 2016 at both UTK and the University of Richmond (UR), while focusing on the long-term planning required for the project, best practices in communicating internally and externally, lessons learned through multiple project iterations, and findings related specifically to students' understanding of what success means to them and the ways in which libraries affect that success.

Introduction

For many colleges and universities, student retention, graduation, and engagement represent priorities to address at both the institutional level and through individual colleges or units. Over the past decade, at the University of Tennessee, Knoxville, these priorities have led to the renovation of existing library spaces and the creation of new ones. More recently, the libraries have expanded their focus on student success with the creation of new functional roles that specifically tie to the university's work to improve retention, provide core student support, and promote graduation in four years. Librarians have long acknowledged that the way that students interact with, use, and understand the library differs from the ways in which they, as librarians, do. Moreover, just as the library represents one entity of the larger campus community to which it belongs, students' experiences with the library represent solely one aspect of their experience on campus. Librarians' interest in hearing, in students' own words, about their experiences, habits, interests, and preferences, both within the library and throughout campus, led to conversations that planted the seeds of this research project and informed a second iteration that involved both UTK and the University of Richmond.

Project Background

The idea of a whiteboard assessment project emerged through conversations regarding assessment opportunities beyond traditional surveys. Through their own experiences, the researchers had encountered some of the limitations of surveys as an assessment methodology, including: data gathering that, at times, missed the target population; the lack of flexibility in multiple-choice responses; and the lack of a clear path forward gleaned from close-ended responses. The researchers' previous experiences with surveys also led them to see the value in creating open-ended questions and to brainstorm opportunities to tap into this value. This brainstorming led to the decision to utilize inexpensive dry-erase boards as a forum for non-traditional assessment.

The two universities' libraries acted as a sounding board for the creation of the questions being asked of students. Before the first iteration of the project at UTK, the researchers developed a list of daily questions that were to be disseminated in different functional areas throughout UTK's central library. They then brought these questions to the UT Libraries' Assessment Committee, where members reviewed and suggested edits to the methodology as well as the wording of particular questions. The group also added additional questions for consideration. The researchers then shared this list of questions, as well as their plans for project sites, to colleagues across the UT Libraries through an all-staff Listserv. The dissemination of these questions and the communications describing the context of the whiteboard study acted as a means of marketing the study throughout the UT Libraries. This process not only led to a more comprehensive list of questions that incorporated multiple voices and perspectives; it also encouraged buy-in and built interest in the project throughout the months that followed.

Methodology

Following Institutional Review Board (IRB) approval, the researchers launched the whiteboard project in spring 2015. Given the public nature of the project, the researchers requested and received a waiver of informed consent under the four factors of 45 CFR 46.116(d) by demonstrating that there was no more than minimal risk to participants; that the rights and welfare of participants were not adversely affected; that the research could not be carried out without the waiver; and that the researchers would provide their contact information in an informed consent statement posted in a highly visible location on each of the whiteboards.

During this first iteration, the researchers placed three whiteboards—large, two-sided, dry-erase surfaces—in public spaces within UTK's main campus library, Hodges. One board was positioned in a central floor lobby, near the library's main entrance, its public services and research desks, a Starbucks, and a mini-market. The second was placed within the "studio," a collaborative space with specialized software and assistance for visual and audio projects that is also located on Hodges Library's central floor. The third board was placed on an upper-level, quiet study floor near elevators, bathrooms, and individual carrels. Each day, for a period of thirty days, the researchers wrote an open-ended question on each of the whiteboards, utilizing the list that they had developed through collaboration with colleagues. These questions focused on four central categories: demographics; habits and preferences; dialogue and community opportunities; and student success. The following morning, the researchers photographed responses, erased the question and wrote a new one. The researchers then uploaded the photographs to a password-protected shared drive.

The second iteration of this project, launched in spring 2016, incorporated several changes from its first version a year earlier. Chief among these were the inclusion of UR's main campus library as a second study location. Two whiteboards were placed at this library. At UTK, three whiteboards were again placed in Hodges Library. Based on a low rate of responses and high rate of board removal or erasure in the studio during 2015, the 2016 iteration moved this board from that location to a group study floor, where it was placed near the elevators, bathrooms, and digital signage. The two other whiteboard locations at UTK remained the same.

Another change implemented during the project's spring 2016 iteration was to change the study period from 30 days of questions to 8 days. Rather than posting a new question each day as in 2015, the researchers posted one question a week, left that question up to collect responses for a period of approximately 24 hours, and then photographed and erased the whiteboards. This change was implemented to prevent a sense of "whiteboard fatigue" that seemed to emerge in the 2015 iteration, as the number of responses began to decrease during the second half of the 30-day study period. This change in format also made it easier for the researchers to oversee the project while balancing their day-to-day responsibilities.

As with the first iteration, the researchers again incorporated feedback from across their libraries about both questions and project sites. Researchers incorporated several questions from their colleagues into this second iteration and then shared follow-up e-mails with all of those who had submitted a suggestion for a question, in order to let these individuals know how or if the question had been incorporated. In some instances, questions were bookmarked for future iterations because they seemed more applicable to fall versus spring semesters or duplicated existing questions.

Considerations in Project Design

Gathering data for this study presented several unforeseen challenges. Among the challenges were the facts that whiteboards could be erased or moved, particularly during overnight hours. The whiteboard in Hodges Library's studio proved especially susceptible to being erased or moved, often into one of the group study rooms that bordered the space, resulting in the decision not to use this location in a second project iteration. Winter weather also proved a challenge in 2015, leading to several days when the university was closed or had a delayed opening, which led to some question prompts staying in place for more than 24 hours. The open-ended approach that the study took also meant that responses were difficult to decipher at times, whether due to handwriting or to having responses written on top of each other. Students not only responded with text; they also incorporated illustrations, emoji, and check marks, and would draw arrows and lines to emphasize other students' responses, which presented an additional consideration in transcribing and coding.

Despite these challenges, data gathering also presented opportunities not available in other assessment methods. The public nature of the project, as well as the open-ended approach that the question prompts offered, enabled participants to not only respond to the original question but also to comment, agree or disagree with, or expand upon other responses. It also provided a real-time opportunity for both participants and those who simply observed the whiteboards on their travels through the libraries to see study data. This approach created excitement and buy-in from library staff, who discussed and offered opinions on the data as it was being added to the boards.

Posting a question on three whiteboards for a period of 30 days in spring 2015 resulted in more than 1,200 responses. This large amount of data, combined with the variety in types of responses (i.e., text, illustrations, emoji, and symbols) led to the understanding of a need to develop rules for transcription. The researchers developed these rules after their second iteration of the project in 2016 and then applied these rules to transcribe the data from both project iterations in a manner that would help ensure consistency. The transcription process involved graduate and undergraduate students, who, after signing a pledge of confidentiality, each focused on transcribing one of the three sets of data (UT Libraries' spring 2015 and spring 2016 data sets and UR's spring 2016 data set). Each day of photos was transcribed onto a separate Microsoft Word document and saved with a filename that included the day (e.g., UTK_WBStudy_Day1_2015). Each document also included subsections that listed the location of the whiteboard and the total number of responses on that board for that particular day. Following the initial coding, each student reviewed the two other sets of transcriptions and noted any areas in which they disagreed or had questions. The researchers then reviewed all of the transcriptions, with particular focus on areas of disagreement, to develop a final set of transcriptions from which to begin coding.

When initially planning the project, the researchers had created a thematic legend for coding, recognizing that, depending upon the popularity of the whiteboards, coding could become cumbersome. Given that consideration, the researchers identified demographics, habits and preferences, dialogue and community opportunities, and student success as the project's four central categories. These codes provided a starting point not only for analyzing responses, but also for discussing actionable items related to the themes that emerged.

Conclusion

The researchers began their work to code responses with an eye towards actionable items related to specific student requests (e.g., more whiteboards throughout the libraries, better signage, particularly for quiet study areas, and enhanced communication regarding existing library services and resources). Preliminary coding, above all, encouraged the researchers to reflect on the vastness and diversity of students' experiences, and, through the second iteration, to examine commonalities and differences across two campuses. At this stage in their development, students are still defining themselves and creating their worldview. As librarians, interactions with students often involve only one persona, rather than reflecting the multiple identities that students have and are continuing to develop. At a reference desk transaction or instruction session, students may not be able to or feel comfortable with verbalizing their larger issues or concerns, whether they involve academic or personal spheres. A project such as this provides an opportunity for students to voice such issues and concerns and, by doing so, perhaps to recognize that there are others who share them or can provide insight on them.

The nature of academic libraries is one of evolution and change, as is the culture of the student body. As students develop and evolve their identities, librarians' skill sets and the ways in which librarians communicate with students also benefit from reflection, adaptation, and a consideration of their own student body and campus community, in addition to larger, aggregate data generally provided by surveys. Both student success initiatives and library assessment related to such work can benefit from looking beyond traditional assessment techniques and methods. Letting students define and describe both their spaces and their worldview through a project such as this nontraditional whiteboard assessment provides a unique opportunity for librarians to create services and spaces that better meet students' needs, and consequently, enables librarians to best be of value to the continually evolving populations that they serve.

Building on Success: Increasing the Impact of an In-House User Satisfaction Survey

Emily Daly
Duke University, USA

Abstract

In 2013, Duke University Libraries' staff transitioned from using LibQUAL+® Lite to a user satisfaction survey designed, tested, and implemented entirely by library staff. Staff in numerous library departments were highly engaged in developing and piloting survey questions, analyzing and responding to findings, and participating in follow-up assessment, including focus groups and observational studies.

The collaboratively designed user needs assessment, which aimed to gather feedback about current and future library services, collections, and spaces, was deemed a success, but we knew there were aspects of the project we could improve when we ran the survey for a second time in the 2015–16 academic year. For instance, we wanted to reach more users, increase our response rate, and focus our efforts on gathering feedback about library services and resources from undergraduate and graduate students. In an effort to create a more valid survey instrument, we worked very closely with student advisory board members and pilot respondents to test the flow of our survey and the format and language of question and answer choices. Based on our low response rate from students in 2013, we adjusted the time of year that we distributed the second survey and offered an incentive to respondents. We also changed our recruitment strategy, basing our invitation to participate on behavioral decision-making research conducted at Duke University. Finally, we worked much more closely with Duke's institutional research staff during our second iteration and integrated many of their well established and refined survey guidelines into our protocol. These numerous changes in strategy enabled us to design a more robust and focused survey that reached many more students than our initial study did.

This short paper highlights lessons we learned in our 2013–14 survey project and changes we implemented in 2015–16 that enabled library staff to gather more substantive findings from a focused user population.

Background

Duke University Libraries has long been committed to learning more about the evolving needs of our researchers and then implementing innovative services, developing new collections and building new spaces in response to our users' demonstrated interests. Like many libraries, we have conducted multiple university-wide surveys in an attempt to learn more about our researchers' perceptions of the services, spaces and collections available for their use. We administered LibQUAL[1] in 2002, 2005, 2007 and LibQUAL Lite in 2011[2] and were prepared to conduct another university-wide user survey in 2013.

In late 2012, assessment and user experience (AUX) staff considered the possibility of administering a survey other than LibQUAL. While we appreciated the potential for benchmarking and comparing results across libraries that also use the LibQUAL framework, we found that we never actually made use of this feature. Perhaps more importantly, we heard from respondents and librarians alike that they found the survey to be too long (prompting our shift to LibQUAL Lite in 2011), the question format difficult to understand, and the results cumbersome to understand and analyze. We felt it was time to consider an alternative. After reviewing numerous in-house and consortial surveys from academic research libraries across the country, we opted to design our own survey, as we knew this would allow us to incorporate extensive branching and Duke-specific answer choices, including academic departments and pilot programs and services implemented at Duke University Libraries, in particular.

While AUX staff members were motivated by the customized options and answer choices of an in-house survey, we were even more excited that a locally-designed survey would allow us to involve staff at every stage of the survey design and implementation. Our goal was for our Duke-specific survey data to guide staff toward making service design changes and help set the direction of future

projects particular to our researchers' needs. By engaging staff in the survey project from start to finish, we hoped they would be more likely to use survey data to inform changes and improvements to library services they provide or oversee.

Survey design, take two

Our 2012–13 survey helped achieve the goal of learning more about users' experiences with the library and enabled us to make improvements based on what we learned, but we knew there were aspects we could improve. For instance, the survey response rate, especially among undergraduates, was fairly low. We were also concerned that survey questions and answer choices were unclear to respondents, thereby undermining the validity of survey findings. In the 2015–16 survey cycle, we endeavored to strengthen the validity of the survey instrument and reach a broader base of potential respondents. We were also able to focus our survey on a core group of users this time around: in 2013–14, we included faculty, undergraduate students, graduate students, staff, and the general public in our survey sample. Because we implemented the Ithaka S+R Local Faculty Survey in fall 2015, we did not target faculty respondents in recruitment for our January 2016 user survey. We opted this time to focus recruitment efforts on undergraduate and graduate students, and because we knew our respondents would be primarily students, we were able to focus our survey structure and questions on this population. Another change is that we shortened this year's survey considerably by reducing demographic questions—in fact, we bypassed this section entirely by recording a unique identifier for each survey respondent and then working with Duke's Institutional Research Service to collect aggregate participant data, including respondents' academic programs and majors/minors, year at Duke, sex, race, and international status.

Overall, we found that the structure of our 2012–13 survey worked well, so we preserved the flow: we first asked users which library they visit most frequently or if they choose *not* to visit a library (it was particularly important to liaison librarians in the sciences to hear from our users who do not visit a physical library; we followed up by asking *why* they opt not to visit physical libraries). We then focused our core questions around particular services, collections, and spaces we were most interested in learning about. We asked questions we felt would help us gather information about users and, more importantly, prompt us to imagine and prioritize possibilities for services, collections, and spaces.

The next section gave respondents an opportunity to share what they viewed as most important to their teaching, research, and learning. We then asked that they indicate their level of satisfaction with the services, collections, and spaces provided by Duke Libraries. Again this year, respondents had an opportunity to tell us what services or resources they did not know were available through Duke Libraries (e.g., data visualization services, streaming audio, digital maps).

Finally, we invited our respondents to share which library services or technologies would most enhance their experience using Duke University Libraries. Options provided in the survey included specialized study spaces and furniture, expanded data and visualization services and support, and increased digital access to unique or rare materials, among others. Respondents were also invited to write in additional services or technologies they believe would enhance their library experience or list equipment they wish they could check out from the library. This particular question is a major reason we chose to invest time and resources to design our own survey: we wanted to hear from our community the programming and services they would like Duke Libraries to pursue in the future.

While our assessment analyst and consultant took the lead on building our home-grown survey in Qualtrics,[3] a survey tool Duke licenses university-wide, she did so with input from numerous library staff, potential survey respondents, and university staff and faculty with expertise in survey design. Using our 2013 survey[4] as a starting point for format and question terminology, AUX staff led numerous meetings to refine the structure and update the text used in 2013 to reflect the resources and services we were most interested in learning more about during this cycle and to ensure question and answer options made sense to our more focused group of student respondents. In addition to leading small group discussions about the format and structure of our survey and questions, we shared our survey with all library staff at library-wide meetings and through e-mail—we wanted no library staff member to feel excluded from the process or to be taken by surprise that we were leading this effort.

After weeks of discussion and work in Qualtrics, we had an instrument ready to test and then implement. Our final survey[5] was short, taking users just four to six minutes to complete on average, but it was complex, featuring extensive branching and customized survey options for each of our library locations.

Recruiting respondents

Once we fully tested and vetted our survey with numerous students and library staff, we began to recruit respondents. Institutional Research provided a sample of 5,889 undergraduates and graduate students, and we directly e-mailed an invitation to take the survey to these students and followed up with reminders twice during the three-week survey window. Additionally, we posted links to the survey to the Duke Libraries homepage and promoted it through social media, student Listservs and subject librarians' departmental e-mails.

At the advice of a university expert in survey design, we opted not to provide incentives for survey respondents during the first implementation of our in-house survey. Because we were disappointed with our overall response rate in 2012–13, however, we decided to provide an incentive of a raffle for a $75 Amazon gift card this time around. Additionally, we worked with the Duke Center for Advanced Hindsight, led by the prominent behavioral economist Dan Ariely, to develop a regret lottery.[6] A regret lottery is based on the notion that respondents feel more pain or loss if they believe they were very close to avoiding loss. We developed a survey invitation invoking the idea that students' names could be picked from the raffle for an Amazon gift card—but they could only claim the prize if they actually completed the survey. Our message included the following language: "Your name has been entered in a drawing for a $75 Amazon gift certificate... If you are the winner of the gift certificate but you have not completed the survey, you are not eligible to receive the $75 Amazon gift certificate." On day one of survey distribution, we sent half of our potential respondents this regret lottery message; the other half received a more traditional survey recruitment email: "To thank you for your participation, you will be entered in a raffle to win a $75 Amazon gift certificate."

In the first 24 hours that our survey was open, we received 1,200 responses, nearly all from the survey links we e-mailed directly to students through Qualtrics (four respondents completed the survey by accessing an open link on the Duke Libraries website during this same 24-hour period). Of the responses from the A/B testing, we had twice as many responses from students who received the regret lottery e-mail than from those who received the more traditional message, and within the first hour of sending the survey directly to students, we had 2.5 times more responses from those who received the regret lottery message. The response rate then normalized a bit over the first 24 hours. Because the regret lottery was so effective, we used the regret lottery text in our two reminder messages to all students who had not yet taken the survey. Our overall response rate from our initial sample was 43%, and we had an additional 945 responses to the survey through open URLs, resulting in a total of 3,467 respondents, significantly more than the 733 responses to our first in-house survey.

Analyzing and sharing results

Because our primary motivation for designing and implementing a survey entirely in-house was to involve our colleagues in reviewing and responding to findings, it was important that we share initial findings as soon after the close of the survey as possible. After sharing high-level findings with library staff, we formed a short-term team of six library staff who volunteered to review and tag over 1,200 free-response comments using a codebook with nearly 50 different topics.

While we were able to gather useful feedback through the survey and free-response comments, we planned from the start to follow our survey period with a series of focus groups to dig more deeply into survey responses. After spending time reviewing the survey data, we hosted six follow-up focus groups, targeting undergraduate and graduate students to learn more about our researchers' experiences with particular services, collections, and spaces they commented on in the survey. Just as we did when we designed the survey instrument, AUX staff solicited input from other library staff, this time to determine what we still needed to know from the initial survey.

By this point, we had survey data from nearly 6,000 respondents, including over 1,200 coded comments, as well as coded notes and themes from six focus group sessions. It was time to share this rich data with our colleagues, which we did through all-staff presentations and follow-up e-mails. Additionally, our assessment analyst and consultant spent

significant time using Tableau Public[7] to develop three dashboards providing different ways to explore survey data and comments.[8]

Making survey data visible and usable in so many ways enabled staff from across the libraries to analyze the data on their own or ask AUX staff to help them delve more deeply into particular questions or slice the data by demographics particular to their areas. We encouraged units and departments to consider survey data and reflect on how library staff might respond to what we learned. We then invited all staff to participate in a workshop to explore the Tableau dashboards and prioritize an initial set of recommendations developed by AUX staff and department heads of units across the libraries. Forty-seven staff representing technical services, public services, IT, building services, and library administration registered to attend the session, working in small groups to explore areas of the data most relevant to their work or interests and consider ways they might respond to findings.

Responding to what we learned

After spending significant time exploring the survey data, comments, and focus group findings, AUX and other library staff developed recommendations to follow up on what we learned. We drafted potential improvements to library spaces, services, and resources. We also made note of services and resources that respondents expressed interest in but appeared to be unaware of—these are marketing opportunities for library staff. In fact, we have established a monthly e-newsletter in response to multiple survey comments requesting more coordinated communication from the library. We have used the newsletter to share information about underutilized services and improvements to our spaces and will continue to use this channel to inform users of changes we have made as a result of student survey responses and focus group findings.

We also outlined needs for further assessment, including developing targeted user surveys, semi-structured interviews, and observational studies to understand more fully our researchers' experience reserving group study rooms and using print and scanning services in the library. After discussing, vetting, and prioritizing the lists of recommendations for expenditures, service improvements, marketing opportunities, and assessment opportunities, AUX staff and library leadership charged task groups and other library staff with acting on findings between now and our next biannual user survey.

Based on the success of our first two in-house survey cycles, we plan to conduct another broad-based university-wide user survey in early 2018, likely targeting both students and faculty. In the meantime, we will continue to make use of the significant amount of data gathered from our 2016 survey, encouraging staff to explore the survey dashboards as they consider new services or the needs of particular user groups. We will support staff as they lead follow-up observational studies, usability studies, and user interviews to develop a deeper understanding of the many ways our researchers engage Duke University Libraries' spaces, services, interfaces, and collections.

Endnotes

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So Everyday: Interviews with Academic Researchers to Understand Their Day-to-Day

Erin R. B. Eldermire and Neely Tang
Cornell University, USA

Abstract

Academic researchers work differently today than they did in the past. If we were to design a library from scratch to support today's academic researcher, what would it look like? How can we adapt our libraries now to best facilitate our researcher's academic lives? To help answer these questions, seven Cornell librarians partnered with Ithaka S+R to study the everyday lives of 21 faculty, graduate, and undergraduate researchers at Cornell University. These participants represented a wide range of disciplines, representing the humanities, social sciences, and sciences.

For one day, participants documented their whereabouts and activities, and then were interviewed using an ethnographic technique. Interviews were transcribed and coded, and major themes emerged to form a picture of the day-to-day lives of academic researchers. Although the qualitative methodology that we used took concerted effort and time, the outcomes of our research were as dynamic as the lives of the people who we studied. Other assessment methods would not have yielded such a deep understanding, and may have fallen short in addressing the transforming lives of researchers. This paper outlines the qualitative methodology that we used, which can be applied to many different populations and user groups to understand the needs, challenges, and variety of people that your library supports.

Introduction

In *Being an Academic*,[1] Joëlle Fanghanel discusses how academic work has changed over the last three decades in relation to social, political, economic, and technological factors. This will come as no surprise to academic researchers who are faced with increasingly complex work demands and growing bodies of literature. These researchers are adapting to changing digital environments while navigating a traditional academic cultural environment, and are often managing far-flung scholarly communities. But how do these changes drive the day-to-day needs of academic researchers, and how might they continue to evolve in the future?

At Cornell University Library—a library system that supports an Ivy League, R1 research university with approximately 2,700 faculty, 22,000 students, and 94 PhD fields, and whose motto is "any person, any study"—we were wondering this very question. As the lives of academic researchers evolve, the libraries that support these populations must similarly adapt to facilitate their research. Furthermore, with this evolving landscape in mind, how can we, the library, best adapt to facilitate research in the academic pursuits of our researchers in terms of academic information, higher education as an industry, and institutional variables at Cornell University?

Kornelia Tancheva, our team lead and associate university librarian for research and learning services, wanted to find answers to the above questions. It was apparent that using an assessment technique such as a survey, which asks specific questions and might not uncover the underlying motivations of certain practices or actions, would not provide the type of insight we were seeking. To understand researchers' day-to-day needs, motivations, and challenges, Tancheva turned to an ethnographic methodology along with the help of Nancy Fried Foster, senior anthropologist at Ithaka S+R.

Tancheva determined that the best way to answer these questions was to gain insight into the lives of academic researchers at Cornell University to discern where the library might integrate into their research processes. To do this, she assembled a team of Cornell librarians who were trained in ethnographic interview skills to help answer her questions. Ultimately, the team sought to understand details of the day-to-day lives of academic researchers, such as their needs, struggles, motivations, and workflows—both academic and personal—to then identify intersections where the

library can adapt to better support members of this population. This is in part because she recognized that, in order to best support a population, the library needs to support the whole person, not just the academic component.

This paper reflects the experiences and observations of two of the team members who conducted this ethnographic research. Both authors were new to this qualitative research method and found the process and outcomes enlightening. Not only did the authors gain deep insight into their library patrons as researchers, but also in taking on the role of researchers themselves, they gained a deeper understanding of the work of their patrons, the work of their colleagues, and the qualitative methodology itself.

Methods

In January 2015, seven librarians (hereafter referred to as the research team) from Cornell University Library embarked on a project to understand the day in the life of a serious researcher at Cornell University in order to imagine what a library built from scratch for the 21st-century researcher might look like. The interdisciplinary research team had representation from the humanities (3), the social sciences (2), and the sciences (2).

Members of the research team participated in two training sessions with Nancy Fried Foster. The first was a day-long orientation to learn ethnographic interview techniques. As a part of the orientation, three researchers from Cornell University were recruited to be interviewed as practice participants. This allowed each member of the research team to participate in at least one practice interview. Though information gleaned during practice interviews was not included in the final analysis, the authors felt that the time spent learning how to interview a participant was invaluable to our training. Learning the art of interviewing takes practice, not just following a list of do's and don'ts. We found that our interviewing skills strengthened with each interview, and that we gained a stronger sense of when to pause and wait and when to ask another open-ended question. The second training occurred after we completed our interviews (more on that below).

The research team recruited 21 researchers (hereafter referred to as participants) at Cornell University for our study. Postings were made on Listservs, and many of the participants were directly recruited based on personal relationships between the researchers and the participants. The participants represented various subject areas (8 from the humanities, 7 from the social sciences, and 6 from the sciences), with 15 women and 6 men participating, and included undergraduates (3), graduates (9), junior faculty (6), and senior faculty (3).

Participants were asked to pinpoint a day during which they planned to concentrate on research. Once they identified this research day, they met with the research team two times. The first time was for a brief introductory meeting between the participant and a research team member. This was held a day or two before the research day, during which the research team member explained the purpose of the study, gave the participant a map and a form on which to record their movements and activities for their research day, and answered any questions. During the introductory meeting, a follow-up interview was scheduled to be held immediately after the participant recorded their research day. It was important to schedule the follow-up interview to be held as soon as possible after the participant's research day to capture details before they were forgotten.

Between these two meetings, participants documented their activities for an entire day during which they focused on research—from waking up to going to sleep, whether academic or personal—as well as their whereabouts at the time of each activity.

At the follow-up interview, two research team members spent approximately one hour with the participant, and interviews focused on how the participant interacted with information during their day. Research team members were assigned to interview participants in an ad-hoc manner, and may or may not have had common disciplinary backgrounds with their research team partner or the participant being interviewed. Participants were asked to bring their form and map and/or anything else they used to keep track of their day. The participant then told the research team members about their day in chronological order. Research team members asked questions throughout the interview to understand the participant's practices in research. When asked to elaborate, participants often generalized, and research team members were careful to bring the conversation back to what happened on that day. At the end of the interview,

participants were given $50 for participating in the study. Interviews were recorded with two audio recorders and transcribed by a professional transcription service.

Interview transcripts were coded using a grounded theory approach first introduced by Glaser and Strauss.[2] This qualitative research method uses coding and other procedures to help the researcher understand participants' behavior.[3] With this grounded theory approach, members of the research team each read a subset of the interview transcripts. Guided again by Nancy Fried Foster of Ithaka S+R[4] in May 2015, the research team met for its second training session, a one-and-a-half day exercise to begin to identify themes in the transcripts. The process of identifying themes continued over many meetings, and after much discussion, codes were agreed upon. Transcripts were again divided equally so that each transcript was coded by at least two research team members who then compared notes. Major coding fields included: (1) academic activities; (2) seeking information; (3) use of library resources; (4) self-discipline/self-management (e.g., tactics employed to manage researcher's own habits, motivation, and distraction); (5) space/work environment; (6) circum-academic activities (e.g., networking, use of social media for academic purposes); (7) obstacles (e.g., interruptions in work); (8) brainwork (e.g., thinking and sensemaking); and (9) technology use. For more information on major coding schemes and results, see Tancheva, et al.[5]

Interdisciplinarity Leads to Richer Outcomes

The interdisciplinary nature of both research team members and participants brought rich outcomes to this project, which were experienced at each phase (implementation, analysis and write-up). Research team members gained insights about the academic research activities of those in other disciplines. For example, the constraints of archival work of historians was revealed to a science librarian during an interview, and was something that the science librarian had not known to consider previous to her involvement in this study. These insights first began to occur when research team members would participate in an interview of a participant with a background other than their own, and it was magnified during the analysis and write-up phases of the study.

Of particular importance in the qualitative methodology that we used were the different viewpoints of research team members during the interview. Because team members often had different backgrounds and therefore different points of view, interviewers complemented each other in asking questions of the participant that the other may not have thought of, which brought a deeper understanding of the participant's narrative. Although we paid no heed to subject backgrounds of interviewers and participants, a mix of backgrounds often proved useful in questioning during interviews.

The interdisciplinary nature of this project also became very apparent during the analysis phase of the study. We quickly realized the difficulty in getting all members of the research team to agree on how to code the transcripts. Although it was established at the start of the project that we would work out a coding scheme, working our way through the process of establishing a scheme was a process in itself. This may be due in part to the interdisciplinary nature of our team, although it probably has something to do with human nature as well. In order to move forward in this phase, strong communication skills and an effort to reach an understanding was necessary for all members of the research team.

Interpretation of the transcripts was another area in which surprising differences—and insights—became apparent. Many participants described processes or behaviors that were foreign to some members of the research team. Reading through these narratives helped research team members from different disciplines develop an awareness of the day-to-day research in other disciplines. In addition, the comments or insights on these behaviors from the subject librarian also helped research team members from other backgrounds understand a particular practice in a new light, like seeing something from a different angle for the first time.

Finally, composing the final report, which was shared with Cornell University Library members and was published on the Ithaka S+R website,[6] was an awakening of a different sense. As the research team collaboratively wrote the final report, we realized that we each had a different way of envisioning how to present the report. These differences were especially apparent along disciplinary backgrounds—research team members with a science background had a much different vision about layout and prose than those with a humanities background—and compromise was essential in reaching a meaningful

endpoint. The same can be said when it came to drawing conclusions from the research and finding a way forward.

Ultimately, we realized that the interdisciplinary nature of both the participants and team members brought an unexpected layer of outcomes and conclusions that would not have become apparent had we not included research team members of diverse backgrounds. We believe that the outcomes of our project were amplified by the interdisciplinary nature of research team members. With this in mind, we recommend others who utilize this approach to gather a team of individuals with diverse backgrounds.

What We Learned

"When you want to know about the lived experience of fellow human beings"—what life is like for an academic researcher in the 21st century—"you just can't beat unstructured interviewing."[7] The in-depth interviews we conducted with our researchers provided us with a wealth of information that could not have been gathered in a less resource-intensive method like conducting a survey. The research team spent multiple days in training and held several team meetings in order to work on the project. The scheduling alone was not an easy task to accomplish with seven different schedules to accommodate. In addition to the time spent with our participants, in the training and in discussion with other members of the research team, each individual spent considerable time going through the transcripts multiple times. Was the time worth it? In our opinion, it was.

Not only did we get a peek into the lives of our patrons, which deepened our understanding of them across disciplines and ranks, but we also learned more about our fellow research team members. As many of the team members were subject librarians, the opportunity to see what research is like in a different area was not only interesting, but it also opened discussions among team members about search best practices and subject context. This unexpected but beneficial outcome of the project has led to some interesting cross-disciplinary discussions and possible research projects within our library.

The research project also allowed the team members to learn and practice what was a new research methodology for most of us. Learning to conduct in-depth interviews has helped us learn new approaches to conducting our reference interviews and informational interviews. We do not claim to be expert interviewers (on the contrary, we wished we had done just a few more practice interviews before diving into the real thing for our project), but have certainly learned new ways of listening and encouraging the participants (or patrons) to share their thoughts with us.

Because this qualitative research method was new to many of us, it was invaluable to have had Nancy Fried Foster as our guide. Not only was she well practiced in ethnographic research, but she also had experience specifically with libraries and the use of the "Day in the Life" method. Her insight and guidance gave us confidence that we could go out and gather good information with these interviews. We feel that if a librarian is interested in doing a similar project and has no experience with such qualitative methods of research, it may save you time, money, and effort in the end to go to an expert to get you started.

The authors also found that this method, as revealing as it is, is also incredibly time intensive. From scheduling meetings for the team to scheduling interviews with participants, it helped to have administrative support for this project. The most time-consuming aspect of the work was the coding process. Getting seven people to agree on a definition of a code takes time, so it is important to try to schedule this activity during a time of the year where the researchers are not also busy with their day-to-day work, such as the beginning of the semester.

Finally, we found that the most challenging part of the research was to figure out how to use the results from our research to answer our question: If we were to design a library from scratch to support today's academic researcher, what would it look like? Having gained insight into a day in the life of our 21 researchers, we organized the information to reflect the research process, academic networking, and self-management. Based on these themes, we suggested two possible service platforms the library could offer the researcher of the 21st century: (1) Make our online presence customizable to the researcher's idiosyncratic research method with the creation of an app store; and (2) think of the library as a social research hub. Interestingly, Cambridge University Library hired design company Modern Human,[8] and independently came up with a similar idea for an app store. Is this what the library of the 21st century

will look like? We do not know, but it is a place for research libraries to start the conversation.

Conclusions

In *Design Anthropology: Theory and Practice*[9] the authors state, "In order to get access to everyday events and actions and understand their meaning for the participants, the researcher has to spend time with the people and engage with their lives." We embraced this sentiment in order to understand the day-to-day lives of the researchers that our university supports. By doing so, we were also able to identify key steps we can take towards meeting the needs of academic researchers in the 21st century.

In summary, the use of this qualitative assessment method led to surprising results, both about the participants that we set out to study and about our colleagues on the research team itself. More importantly, the methodology that we used helped us to develop a story about our study population that reflected the complexities, idiosyncrasies, and the human aspects that we would not have captured otherwise. This methodology can be widely applied to research about libraries and the populations that they support.

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Proficiencies for Assessment Librarians and Coordinators: Defining a Profession

Mark Emmons
University of New Mexico, USA

Alice Daugherty
Louisiana State University, USA

Lisa R. Horowitz
Massachusetts Institute of Technology, USA

Carol Mollman
Washington University in St. Louis, USA

Megan Oakleaf
Syracuse University, USA

Zoltán Szentkirályi
Southern Methodist University, USA

Terry Taylor
DePaul University, USA

Abstract

The Association of College & Research Libraries (ACRL) charged a task force with developing *Standards for Proficiencies for Assessment Librarians and Coordinators*. In a higher education environment with increasing accountability and diminishing resources, library administrators have responded by assigning assessment duties to librarians or creating assessment librarian positions to assess the value of the library and create a culture of assessment. The *Standards* describe the proficiencies assessment librarians need to be successful in their jobs.

The task force collected proficiencies by brainstorming, conducting a literature review, reaping assessment proficiencies from existing library standards, and surveying assessment experts in librarianship and in higher education. The task force applied card sorting techniques to categorize proficiencies.

The standards comprise 11 broad categories and 52 specific proficiencies. Categories include (1) *knowledge of assessment in libraries and higher education*, (2) *ethics*, (3) *assessment methods and strategies*, (4) *research design*, (5) *data collection and analysis*, (6) *communication and reporting*, (7) *advocacy and marketing*, (8) *collaboration and partnerships*, (9) *leadership*, (10) *management*, and (11) *mentoring, training, and coaching*.

The *Standards for Proficiencies for Assessment Librarians and Coordinators* allow academic libraries

to begin with a common definition of assessment librarian responsibilities. Proficiencies may be used to write job descriptions that define the duties of assessment librarians, assess performance and guide evaluation, and develop professional development programs. Ultimately, the *Standards* should help librarians demonstrate their library's value to the institution.

Task force members included: Mark Emmons (chair), Stephanie Alexander, Karen Brown, Alice Daugherty, Lisa Horowitz, JoAnn Jacoby, Carol Mollman, Megan Oakleaf, Terry Taylor, and Zoltán Szentkirályi.

Introduction

The Association of College & Research Libraries (ACRL) charged a task force with developing *Standards for Proficiencies for Assessment Librarians and Coordinators*. In response to a higher education environment with increasing accountability and diminishing resources, library administrators have assigned assessment duties to librarians or created assessment librarian positions in order to assess the value of the library and create a culture of assessment. The *Standards* describe the proficiencies assessment librarians need to be successful in their jobs. This paper describes the approach used by the task force to develop the proficiencies including (1) determining and dividing the scope of work; (2) synthesizing and collating findings; and (3) finalizing the *Standards* and describing ways in which librarians might use the proficiencies.

The Divergent Phase: A Generative Process

The task force began its work with a generative process designed to produce a large pool of potential assessment proficiencies. The task force broke into five subgroups, each led by a task force member and each responsible for a different task.

The following list explains the tasks completed by each subgroup:

- The *Best Practices* subgroup reviewed the literature for best practices in developing job proficiencies. Specifically, members in this subgroup aligned the task force's workflow and methodologies with similar successful processes found in the literature.
- The *Tacit Knowledge* subgroup analyzed the task force's own work as assessment librarians to produce a list of assessment proficiencies. Members created a combined profile of assessment proficiencies based on task force members' experiences with assessment as part of their own job expectations. Each task force member, even those not part of this subgroup, contributed to the overall document. This was a crowd-sourcing exercise and members were asked to only add to the profile without any deleting or removing of content, and no editing occurred until everyone had contributed.
- The *Literature Review* subgroup developed a list of competencies from a literature review. Due to the large quantity, literature was divided by subtopics that included papers and presentations from the Library Assessment Conference, papers from other library conferences or higher education conferences dealing with assessment, other articles and monographs focused on higher education, and articles and monographs within librarianship. The subgroup produced a list of over 40 citations and approximately 150 overlapping competencies. Citations from the literature review became the basis for the bibliography, with all members of the task force contributing citations for materials used.
- The *Survey* subgroup created and deployed an eight-question survey to a list of assessment experts in librarianship and within higher education. Survey participants were asked to rank short lists of assessment competencies following the five assessment proficiency areas in Oakleaf's *Academic Library Value: The Impact Starter Kit*,[1] which were (1) higher education context, (2) institutional context, (3) data, (4) collaboration, and (5) assessment.
- The *Standards* subgroup collected assessment proficiencies from existing professional standards. They compiled and analyzed library standards from the 11 ALA divisions. There were 22 documents identified as having some mention of assessment competencies.

Based on each group's work, a pool of proficiencies was created—some overlapping, some with similar wording across the groups, and some unique to the area researched by the group. The task force organized these results by defining proficiency categories, reviewing the grand list of all proficiencies, reducing the list, and refining the wording of proficiencies to represent each subgroup. This work of refining and categorizing the different wording encountered for various proficiencies in the literature, standards, and survey responses was the second phase of the process.

The Convergent Phase: Synthesizing Findings

Each of the data points gathered by each of these work groups described a proficiency, but the data varied widely and was not uniform. The task force brainstormed tools that might serve to categorize and classify the proficiencies. Members of the task force all had solid experience in assessment and methods for analyzing data. Potential strategies included affinity diagramming (a tool that groups ideas generated by brainstorming and organizes them into groupings based on their natural relationships), open card sorting (a usability tool in which users find patterns in information and organize ideas in categories that make sense to them), and Delphi card sorting (based on a method in which each participant reviews and revises the organization/structure designed by the previous participant).

After discussing the strengths and weaknesses of these approaches, the task force chose card sorting as the best tool for this purpose. The combined list of 260 items produced by the various groups was deduped by Emmons by removing identical or virtually identical items to produce a list of 234 items. This set of items was then fed to a card sorting software, OptimalSort, for use by the task force. Each task force member then did two card sorts, one manual, in which the data points were listed on "cards" that were cut out and arranged, and then in the software tool. In each case, task force members grouped cards and named categories for the groupings.

Emmons worked with the software, generating categories listings (grouping cards in the categories given similar names by the task force); a dendrogram[2] (a tree diagram with a hierarchy based on degree of similarity or number of shared characteristics), and a similarity matrix (a graphic form of expressing the percentage of times two items appear in the same category; e.g., verbal communication and written communication appear in the same category 100% of the time, while they appear with "demonstrate oral and written communication skills" only 87% of the time).

All task force members worked together to evaluate the various ways that the software had grouped the individual card sorts. In the end, the task force members' categories were merged, combined, and revised, resulting in eleven categories:

1. Knowledge of Assessment in Libraries and Higher Education
2. Ethics
3. Assessment Methods and Strategies
4. Research Design
5. Data Collection and Analysis
6. Communication and Reporting
7. Advocacy and Marketing
8. Collaboration and Partnerships
9. Leadership
10. Management
11. Mentoring, Training, and Coaching

Once the categories were defined, individual proficiencies were assigned to the new categories. The task force split into groups to work on each category, deduping, editing, and combining proficiencies. Each group created a document describing in greater detail the specific proficiencies in the areas assigned to that group. The challenge was to make each proficiency meaningful in itself as well as within the category, reflective of the different ways that each one had been identified, and able to be applied to a job description. Wording was selected so that specific skills and proficiencies could be properly interpreted and not vague in their meaning. The groups sought to represent each proficiency area comprehensively, so that no details from the prior phase of researching and soliciting input were left out.

As the categories indicate, some responsibilities and roles of assessment staff might include managerial aspects, which are not necessarily required in every assessment person. At the same time, leadership proficiencies are important in many aspects of assessment, regardless of managerial position. Disentangling other seemingly similar categories, such as *Research Design* from *Data Collection and Analysis*, or *Communication and Reporting* from *Advocacy and Marketing*, helped clarify both the proficiencies and the categories.

The documents created by each of the groups were then consolidated into a single comprehensive source of all wording that was discovered during the divergent phase. The entire task force again reviewed them. Was the language clear? Were there any duplicates? Were they parallel in how they portrayed each proficiency? Individuals re-edited various aspects of the proficiencies until the group agreed. They were ready to be shared!

Finalizing the Standards

The task force solicited feedback from library professionals on the completed draft standards. The document draft and a call for comments were posted on the web site of *College & Research Libraries News*. The task force compiled a list of relevant Listservs and sent out the call with a deadline of June 1, 2016. Emmons, as task force chair, compiled the comments into the standards draft and sent that back to the task force members who, in turn, provided their perspectives on the responses received from the user community. Some comments indicated that minor modifications to the language would be helpful or recommended changes to the title of the document. The task force had made a deliberate choice to focus on proficiencies rather than assessment librarian job titles, and many of the comments suggested a focus on specific specialties within assessment, such as collections or instruction, including the suggestion of additional resources for the bibliography.

Once the draft was revised to incorporate comments and/or clarifications, the final draft was submitted to the ACRL Standards Committee for approval on June 30, 2016. The *Standards for Proficiencies for Assessment Librarians and Coordinators* are available on the ACRL Guidelines, Standards, and Frameworks web page at http://www.ala.org/acrl/standards.

Conclusion

The ACRL *Standards for Proficiencies for Assessment Librarians and Coordinators* is a document that can provide academic libraries and assessment librarians with a number of practical benefits. The *Standards* offer a common definition of the job responsibilities of assessment librarians—one that librarians can use within their individual libraries to craft position descriptions, onboard new employees, guide professional development, and inform performance appraisals. The *Standards* can also be employed at a national level to guide capacity-building offerings provided by professional associations, develop communities of practice, and enhance library and information science curricula.[3] Once shared with the professional community, the *Standards* will serve as a document that defines and clarifies the work of library assessment professionals in the years to come.

Endnotes

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Creating Sustainable Assessment Practice through Collaborative Leadership: Informing and Being Informed by Higher Education Leaders

Lisa Janicke Hinchliffe
University of Illinois at Urbana-Champaign, USA

Kara J. Malenfant
Association of College & Research Libraries, USA

Karen Brown
Dominican University, USA

Abstract

Meaningful and sustained assessment is best achieved when the academic library takes a collaborative leadership role on campus. Simply developing and implementing assessment for the library is not enough. While the value of collaboration among diverse campus constituents is widely recognized, it is not easily achieved. This paper synthesizes the results of the *Assessment in Action* (AiA) program that involved over 200 campus teams led by librarians, shares the reactions of executive directors of higher education and research associations to the results, and discusses how the Association of College & Research Libraries will be further developing professional development for assessment as a result.

The Association of College & Research Libraries' (ACRL) Value of Academic Libraries Initiative has been flourishing since its inception in 2010 with the publication of the *Value of Academic Libraries: A Comprehensive Research Review and Report*[1] The *Assessment in Action* (AiA) program is a cornerstone of that success, supporting more than 200 campus teams in investigating the impact of the library on student learning and success.

Assessment in Action

Funded through a National Leadership Demonstration Grant by the Institute of Museum and Library Services, AiA was undertaken in partnership with the Association for Institutional Research (AIR) and the Association of Public and Land-grant Universities (APLU). The grant supported the design, implementation, and evaluation of AiA in order to strengthen the competencies of librarians in campus leadership and data-informed advocacy, to foster collaborative campus relationships around assessment, and to build an evidence base about the impact of academic libraries on student learning and success as well as document effective assessment practices and strategies.

Assessment in Action Program Design

The AiA program design emerged from the discussions at the national summits that ACRL hosted in 2001, funded by an IMLS Collaborative Planning Grant, in partnership with AIR, APLU, and the Council of Independent Colleges. The summits were attended by teams from 22 postsecondary institutions, including senior librarians, chief academic administrators, and institutional researchers, for discussions about library impact. Fifteen representatives from higher education organizations and associations also participated in the discussions as well. Four themes emerged about the dynamic nature of assessment in higher education from the summits:

- Accountability drives higher education discussions.
- A unified approach to institutional assessment is essential.
- Student learning and success are the primary focus of higher education assessment.
- Academic administrators and accreditors seek evidence-based reports of measurable impact.

Details about the summits and the resultant themes and recommendations are in the freely available

white paper *Connect, Collaborate, and Communicate: A Report from the Value of Academic Libraries Summits*.[2]

Community of Practice
AiA facilitators[3] worked with Etienne Wenger-Trayner and Bev Wenger-Trayner in designing the AiA program, drawing on their concept of communities of practice. They define communities of practice as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly."[4]

Unlike traditional educational models that spotlight an instructor's central role as the "sage on the stage" with primary authority and content expertise, AiA's blended learning model emphasized the facilitative role of instructors (i.e., "guide on the side"). AiA participants worked collaboratively in face-to-face sessions, webcasts, and asynchronous online environments to create, share, and build content and products. This network supported collective learning, shared competence, sustained interaction, and a climate of mutuality and trust. In the process, a strong community of practice developed. The focus on active learning also led to a deeper understanding of what happens when knowledge and skills are applied in practice.

Action Research
The design of AiA also drew on the concept of action research.[5] Action research is understood as "a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes... it seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities."[6] Key concepts in this definition that were emphasized in the curriculum of AiA are participatory, democratic, and practical solutions.

AiA was aimed at identifying important questions about library impact on student learning and success, designing assessments that reveal information about library contributions, and taking action based on what has been discovered. Action research challenged AiA participants to go beyond library use and satisfaction and examine questions of impact and outcomes. It was understood that not all projects would demonstrate that there is in fact a library impact but that developing and implementing a project as part of the AiA program would engender learning, spur action, and build capacity for continued work.

Each of the AiA teams submitted a report about their project, which is available online along with an interface for filtering results based on institution type, geographic location, enrollment, accreditation body, library budget, and library staffing levels, among other criteria.[7]

Assessment in Action Findings

In addition to the individual reports, for each year of the AiA program, ACRL produced a synthesis of the findings.[8] These findings comprise a body of evidence about the impact of academic libraries on student learning and success, but also about effective practices in library leadership and campus collaboration on assessment.

AiA projects provide compelling evidence that students benefit from library instruction in their initial coursework, library use increases student success, collaborative academic programs and services involving the library enhance student learning, information literacy instruction strengthens general education outcomes, and library research consultation services boost student learning. There is an evidence base developing to demonstrate that student retention improves with library instructional services, library instruction adds value to a student's long-term academic experience, the library promotes academic rapport and student engagement, and use of library space relates positively to student learning and success.

AiA reports also reveal that a team-based approach to assessment leads to meaningful collaboration and problem solving. Each team, consisting of members from different campus departments and units, engaged in important conversations about different attributes of student learning and success. A collaborative approach also builds understanding of the functions and roles of different campus constituents in advancing the institution's academic priorities. In addition, the assessment work tends to promote sustainable organizational change and move beyond a single project, because a team-based effort recognizes the multifaceted nature of student learning. Compelling findings about student learning and success emerge that have campus-wide significance.

For librarians leading campus teams, analysis of AiA reports provides insight into emergent leadership practices for collaborative assessment, including ability to achieve common understanding about definitions and attributes of academic success, produce meaningful measures of student learning, keep collaborative assessment activities aligned with institutional priorities, and create a unified campus message about student learning and success. Many AiA projects modeled these types of collaborative leadership approaches to conducting assessment and using the results to create transformative and sustainable change.

Building on Assessment in Action

As the three-year AiA project came to a close, the success of the projects motivated ACRL to identify next steps that would build on the AiA program. In order to continue to align ACRL's efforts with both member needs and higher education at large, AiA project leaders conducted exploratory interviews with the executive directors of 12 higher education and research organizations in fall/winter 2015.[9] In each case, the project leaders shared the findings of the AiA program and then held a semi-structured discussion with the higher education leaders in order to gather input for planning next steps.

Four themes emerged from these conversations regarding key trends in higher education related to the assessment of student learning and students' academic experiences that inform library leadership and engagement with campus constituents:

1. Astute Use of Data: Significant effort within the higher education arena has been focused on collecting, analyzing, and interpreting data, but we now need to know if the yield in student learning improvements is proportional to the effort. Energy is now being directed towards better use of evidence to make improvements rather than conducting new research.
2. Leadership as Advocacy: It is essential to have leadership in using evidence to make improvements at the program director level. Higher education institutions need individuals who know how to identify and use the appropriate data in collaboration with others on campus. Think of these leaders as ambassadors and advocates.
3. Contextual Nature of the Educational Experience: The emphasis is now shifting to how students are achieving general learning outcomes related to critical thinking across disciplines and through experiences in and out of the classroom. How do different educational experiences correlate to learning? Many students need a rich array of learning experiences to complete a degree.
4. Role of Higher Education: New questions are emerging. How does higher education contribute to an individual's lifelong learning for careers and general life satisfaction? What is the role of higher education in our national life? If higher education associations can show the impact of colleges and universities on the education of students broadly, then members of these associations will benefit.

The findings from AiA were well-received by higher education leaders in this context, and ACRL was encouraged to focus its efforts on communicating these findings broadly and supporting librarians in using the findings in advocating for libraries.

As a result of these recommendations, as well as input from the ACRL Board of Directors and the ACRL Value of Academic Libraries Committee, two new programs are being developed on the basis of the AiA design and findings.

The first program supports the need for an ongoing professional development program for libraries to continue to develop their assessment skills and competencies. Currently titled "The Action Research Roadshow," this day-long workshop will first be offered at the ACRL 2017 Conference as a preconference and thereafter be available for contracted delivery onsite in a region, state, or institution. Focusing on strategic and sustainable assessment, participants in the workshop will identify institutional priorities and campus partners, design an assessment project grounded in action research, and prepare a plan for communicating the project results.

The second program is aimed at supporting librarians in using the findings for evidence-based advocacy for academic libraries. Primarily conceptualized to serve the needs of library administrators, this program is in development. Its initial offering will be at the ACRL 2017 conference and will be for directors of those libraries that participated in the AiA program. Future offerings will be designed based on the assessment of that program.

In addition to these two programs, ACRL's Value of Academic Libraries initiative continues to further research on library contributions to student learning and success. In April 2016, ACRL issued a request for proposals for the design, development, and delivery of a new ACRL "Action-Oriented Research Agenda on Library Contributions to Student Learning and Success." In July, a team from OCLC research was selected to investigate and write a research agenda that provides an update on progress since the publication of the *Value of Academic Libraries* report in 2010 and examines important questions where more research is needed in areas critical to the higher education sector. The final research agenda document will also highlight programs and services in academic libraries that have evidence of effectiveness and of promise, which are informed by significant research or multiple project findings, clearly identifying transferrable knowledge.[10]

Conclusion

AiA was a highly successful program that achieved its goals to strengthen the competencies of librarians in campus leadership and data-informed advocacy, to foster collaborative campus relationships around assessment, to build an evidence base about the impact of academic libraries on student learning and success, and to document effective assessment practices and strategies. AiA also demonstrated that meaningful and sustained assessment is best achieved when the academic library takes a collaborative leadership role on campus. From these results, ACRL continues to develop its Value of Academic Libraries initiative, meeting library needs and responding to the needs of higher education at large.

Lisa Janicke Hinchliffe
Professor/ Coordinator for Information Literacy Services and Instruction, University Library
Affiliate Faculty, School of Information Sciences
University of Illinois, 1408 West Gregory Drive, Urbana, Illinois 61801
ljanicke@illinois.edu

Kara J. Malenfant
Senior Strategist for Special Initiatives
Association of College & Research Libraries
50 East Huron Street, Chicago, Illinois 60611
kmalenfant@ala.org

Karen Brown
Professor
School of Information Studies
Dominican University, 7900 W. Division Street, River Forest, IL 60305
kbrown@dom.edu

Endnotes

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3. AiA design/facilitation team was led by Debra Gilchrist, vice president for learning and student success, Pierce College, WA; Lisa Janicke Hinchliffe, coordinator for information literacy and professor, University of Illinois at Urbana-Champaign; and Kara Malenfant, senior strategist for special initiatives, Association of College & Research Libraries. Additional designers/facilitators participated throughout the length of the project: April Cunningham, library instruction coordinator at Saddleback College in Mission Viejo, CA; Carrie Donovan, head of teaching and learning for the Indiana University Libraries in Bloomington, IN; Eric Resnis, organizational effectiveness specialist in the libraries at Miami University in Oxford, OH; and John Watts, undergraduate learning librarian at University of Nevada, Las Vegas. Libby Miles, associate professor of writing and rhetoric in the Harrington School of Communication and Media at the University of Rhode Island in Kingston, RI, was part of the facilitation team for the first 18 months of the program. Project analyst Karen Brown, professor at the Graduate School of Library and Information Science at Dominican University, IL, worked with the team to document

replicable action learning projects undertaken by the institutional teams.

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9. The higher education and research organizations are Achieving the Dream, American Association of State Colleges and Universities, Association for Institutional Research, Association of American Colleges and Universities, Association of Public and Land-grant Universities, Center of Inquiry in the Liberal Arts (Wabash College), Community College Research Center (Columbia University), Council of Independent Colleges, National Institute for Learning Outcomes Assessment, National Survey of Student Engagement, Pew Research Center, and Student Affairs Administrators of Higher Education.

10. Additional information about this program is available from OCLC Research at http://www.oclc.org/research/themes/user-studies/acrl-agenda.html and, in proceedings for this conference, see: Lynn Silipigni Connaway, William Harvey, Vanessa Kitzie, and Stephanie Mikitish, "What Do We Want to Know: Completing an Action-Oriented Research Agenda," in *Proceedings of the 2016 Library Assessment Conference: Building Effective, Sustainable, Practical Assessment*, October 31–November 2, Arlington, Virginia (Washington DC: Association of Research Libraries, 2017), 491–503, http://libraryassessment.org/bm~doc/proceedings-lac-2016.pdf.

A Day in the Life: Practical Strategies for Understanding Student Space-Use Practices

Andrew Asher
Indiana University Bloomington, USA

Juliann Couture
University of Colorado Boulder, USA

Jean Amaral
Borough of Manhattan Community College, CUNY, USA

Maura Smale
City University of New York, City Tech, USA

Sara Lowe
Indiana University-Purdue University Indianapolis, USA

Donna Lanclos
University of North Carolina at Charlotte, USA

Mariana Regalado
Brooklyn College, CUNY, USA

Barbara Fister
Gustavus Adolphus College, USA

The "A Day in the Life" (ADITL) Project was a collaborative multi-sited ethnographic exploration of students' space-use practices at eight universities: Indiana University Bloomington (IUB), Indiana University-Purdue University Indianapolis (IUPUI), Gustavus Adolphus College (GAC), University of Colorado, Boulder (UCB), University of North Carolina, Charlotte (UNCC), City University of New York, City Tech (CUNY CT), City University of New York Borough of Manhattan Community College (CUNY BMCC), and City University of New York Brooklyn College (CUNY BC). These universities were chosen to represent a cross-section of the types of higher education institutions and diversity of the student body in the United States (Table 1). Using a mixed-methods approach to data collection that combined text message surveys delivered via students' mobile telephones and qualitative interviews, this study examined space use by constructing a detailed map of each student's day, including the day's tasks and activities, the spaces and locations in which the student conducted academic research and day-to-day work, and the ways the university library and other campus locations fit within the student's overall educational experience.

Table 1: Characteristics of ADITL Participating Universities

University	Participants	Student Population	Carnegie Classification	Size & Setting
CUNY BC	18	17,390	Master's Colleges & Universities: Larger Programs	Four-year, large, primarily nonresidential
CUNY BMCC	20	26,606	Associate's Colleges: High Transfer-High Traditional	Two-year, very large, nonresidential
CUNY CT	20	15,579	Baccalaureate Colleges: Larger Programs	Four-year, large, nonresidential
GAC	19	2,457	Baccalaureate Colleges: Arts & Sciences Focus	Four-year, small, highly residential
IUB	56	46,416	Doctoral Universities: Highest Research Activity	Four-year, large, primarily residential
IUPUI	31	30,690	Doctoral Universities: Higher Research Activity	Four-year, large, primarily nonresidential
UCB	23	32,432	Doctoral Universities: Highest Research Activity	Four-year, large, primarily residential
UNCC	18	27,238	Doctoral Universities: Higher Research Activity	Four-year, large, primarily nonresidential

The analyses of these everyday practices enabled the ADITL project team to make comparisons about how student needs vary within different institutional contexts and to uncover differences in experiences associated with demographic variables such as age, economic class, and university environment. In this way, the ADITL project sought to holistically understand how the complexity of students' life contexts are interrelated with the development of university programs, services, and resources intended to effectively address students' needs. By investigating the local expression of "taskscapes," or the ensembles of related social activities that take place across space and time,[1] this study helps provide critical information about students' lived experiences, enabling the research team to make recommendations for specific libraries and universities to more effectively respond to students' needs.

Methods

The ADITL project team recruited 205 students (see Table 1) to participate, and asked them to choose one of two days during the workweek to receive the text message surveys.[2] Twelve surveys were sent to each participant approximately 75 minutes apart, which asked students to respond to three questions indicating their location, what activity they were participating in, and how they felt at that time (Appendix A).[3] The 75-minute interval was chosen to ensure that students received surveys during different parts of the hour throughout the day in order to help avoid potential bias caused by scheduling effects (e.g., most universities schedule courses to begin and end at consistent times in an hour, such as starting on the hour and ending at 10 minutes to the hour). Surveys for all eight participating universities were sent on the same days and at the same times to ensure comparability across the research locations, beginning at 9:10 a.m. and ending at 10:55 p.m. Students were instructed not to interrupt their courses to respond to the messages and not to respond if it was unsafe to do so (e.g., while driving). In these circumstances students were asked to respond once they became available and to provide information about what they were doing when the message arrived. In total, 2,210 responses were collected.

Once the survey was completed, the research team used the responses to create a day map for each student. This map was then used to guide a semi-structured debriefing interview with each student that used open-ended questions to explore students' daily experiences of spaces and places, and the spaces and practices they used to complete their academic assignments, research, and other day-to-day work (Appendix B). These interviews were transcribed and thematically coded by the research team using Dedoose qualitative data analysis (QDA) software.

Quantitative Findings

The quantitative data provided by the text message surveys revealed strong patterns in students' spatial experiences among the universities. These patterns suggested that a university's setting had a strong effect on spatial practices, while the classification of the university mattered very little. Within the eight universities, three patterns emerged: residential campuses (IUB, GAC, UCB), non-residential campuses in semi-urban locations (IUPUI, UNCC), and non-residential campuses in highly urban locations (CUNY BC, CUNY CT, CUNY BMCC). These three groups exhibited very similar total travel distances, commuting times, and average distances between locations among their constituent universities (Table 2, Figures 1 and 2).

Table 2: Reported Distances (in meters) and Commuting Times (in minutes)

University	Median Distance Traveled (m)	Median Reported Commute Time (min)	Average distance between locations (m)
IUB	6,769	10	795
UCB	8,001	10	1,557
GAC	5,959	10	684
IUPUI	10,878	25	2,820
UNCC	24,993	15	4,645
CUNY BC	15,293	35	1,695
CUNY CT	16,407	60	2,424
CUNY BMCC	23,541	50	3,174

Figure 1: Total Distance Traveled (in meters)

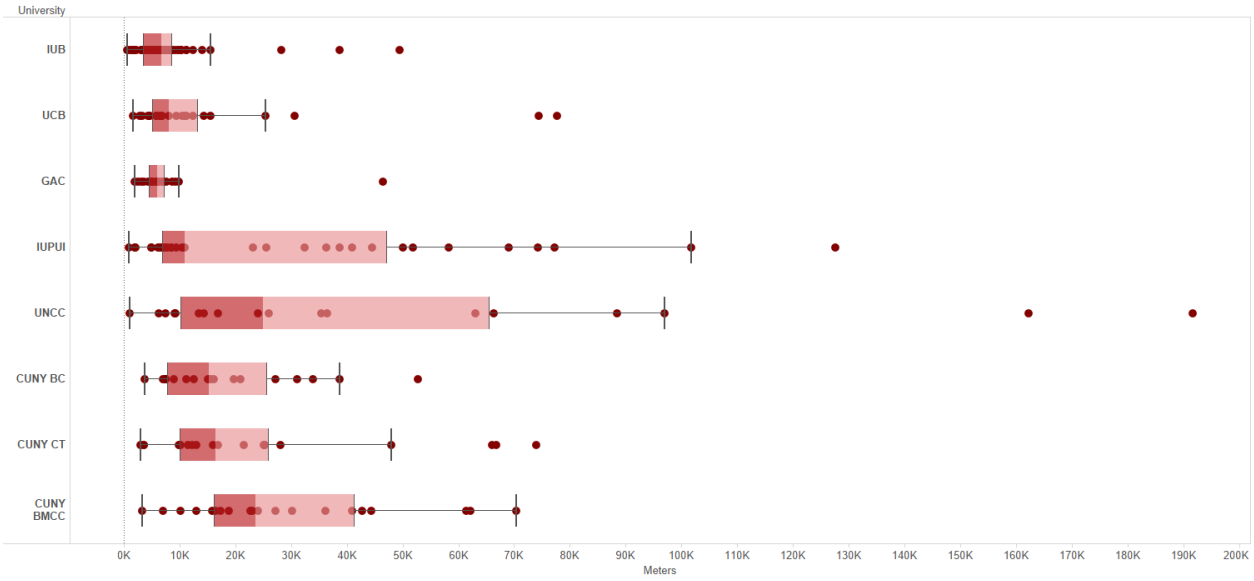
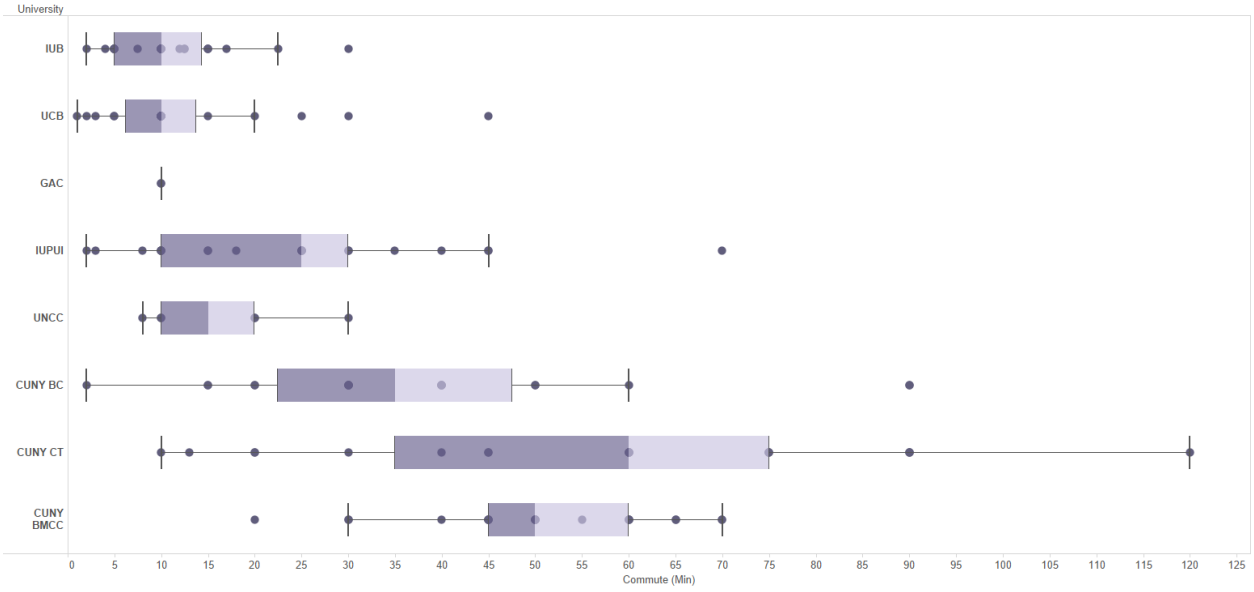


Figure 2: Reported Commuting Times



While the travel time and distance figures suggest very different spatial experiences, students from all eight universities reported very similar distributions of activities (Table. 3). These results suggest that the tasks of student life are quite similar among students at all types of universities, but where and how these tasks get accomplished and the qualitative experience of these tasks might vary significantly.

Table 3: Distribution of Reported Activities

University	Attending Class	Commuting	Eating	Family, Social, or Recreational Activities	Other	Studying or other academic work	Working
IUB	16.80%	8.08%	10.94%	21.08%	10.94%	29.48%	2.69%
UCB	19.35%	7.37%	9.68%	17.51%	12.90%	27.65%	5.53%
GAC	18.14%	2.79%	11.63%	21.40%	13.49%	22.79%	9.77%
IUPUI	19.76%	7.19%	11.98%	18.86%	11.68%	20.96%	9.58%
UNCC	15.82%	8.47%	10.17%	20.34%	11.86%	22.60%	10.73%
CUNY BC	20.00%	9.00%	8.50%	17.00%	17.00%	26.50%	2.00%
CUNY CT	22.16%	11.86%	9.28%	12.37%	13.92%	27.32%	3.09%
CUNY BMCC	20.33%	11.54%	8.24%	8.24%	21.43%	24.18%	6.04%

Insights from Residential Campuses

Student movements at the three primarily residential colleges and universities—IUB, UCB, and GAC (located in St. Peter, Minnesota)—centered on the campus itself, as is reflected in the maps created from geocoded data. Students move frequently within a small geographic area, primarily between residence halls and other campus buildings or locations in town near the campus. The University of Colorado Boulder and Indiana University Bloomington are each the flagship campuses of their university system. At IUB, nearly all students live in Bloomington, though it is common for undergraduates to live in residence halls at the beginning of their college careers and move off-campus as they progress through their degree programs. UCB is also primarily residential, though, as the cost of living in Boulder has risen, some students have moved to locations outside the city and must travel longer distances to campus. Gustavus is both the smallest institution in this study and is entirely residential; the movements of Gustavus students were almost completely confined to campus as they traveled between residence halls, classrooms, campus jobs, and meeting rooms.

At UCB, student study preference is dependent on a variety of factors including attributes of home, distance between locations, and balancing academic, employment, and extracurricular commitments. Roommates or family living arrangements played a strong role in determining preferred study location, with students who lived with more than one person citing the library as a quiet space away from distractions. Additionally, the library signaled to students as a place to do serious academic work because of the quiet and observing peers doing focused work. When tempted to get distracted, students noted that seeing others engaged in studying activities helped them focus on their academic work.

The decision to primarily study at home or in a residence hall was driven by several factors, including having a dedicated work space, either a desk or large table, access to food and supplies, and peers or roommates with related academic interests. One student noted that studying at home meant "I have a desk set up and I have like my highlighters and my markers and everything in this little mini file drawer" and that she knew she would have space to spread out. Lack of available seating and table space at the main library was one of the main reasons that some students chose to study in alternative locations. Access to parking and related safety concerns was another barrier to students choosing to study in the library. The UCB libraries are primarily situated in a part of campus where parking is limited, and the parking that is available is expensive. Students who primarily study later in the evening chose alternate study lounges in residence halls or other parts of campus where ample parking is available

or it is a shorter distance to walk home or to public transportation.

Though students at GAC did not travel far, they traveled constantly: among classroom buildings, labs, music ensembles, athletic practice, on-campus and off-campus jobs, and myriad extracurricular and volunteer activities. All of the students had at least one job, several had two, and one had three. Their days were a patchwork of activities, with the selection of study spaces partly determined by whether—at that point in their daily schedule—they needed quiet or stimulation. The word they used most often in describing their preferred study space was "quiet," which was mentioned almost twice as often as the desire to have surrounding activity. Specific furnishings (whiteboards, computers, comfortable seating) were also mentioned, as was the value of having everything you need within reach, as a benefit of studying in one's residence.

In the past, the library at GAC was *the* study site on campus. As residence halls have been improved, with many students living in apartments with kitchens and private rooms, students are more likely to "nest" in them than in the past when dorms were more noisy and social. Of four study sites mentioned by the 19 students interviewed, their dorm or apartment was most often mentioned, usually with some discussion of negotiating levels of distraction and noise with roommates. The library was the next most frequently-mentioned study choice, though students named different areas. Some preferred isolating themselves in single carrels, while others preferred more social spaces or saw the library as the meeting place for groups to work together. A campus cafe was popular among students who liked a social buzz around them as they studied, feeling comforted that they were not alone, but students who wanted both space and privacy often chose to study in vacant classrooms in a new academic building. In contrast, several students mentioned that they found the quiet floor in the library intimidating and even prison-like.

GAC students, like all of the students we interviewed, were very clear about why they studied in different places. Several favored the large whiteboards in the new academic building. Others felt they needed the ambient noise and movement of the café for stimulation. Some preferred their dorm because it was their private space where everything was just where they wanted it to be. One said she would go to the library "when I really have to pound something out" but others disliked the serious atmosphere: "sometimes when I come to the library, everyone is like so focused and it stresses me out to be more focused."

Insights from Mainly Non-Residential Campuses

IUPUI is an urban campus with a largely commuter student body. This may be slowly changing as more dorms are built on campus. In 2014, 36% of first-time beginner students lived on campus.[4] Students report a lot of movement between campus, home, work, and other locations. Parking was mentioned frequently by students as the worst thing about the campus.

University of North Carolina, Charlotte, is a suburban university, and the clusters of places that students use are not limited to the campus, which is north and east of the city center, but include the suburban places where students live and occasionally work. Our statistics make it clear that Charlotte students drive the greatest distance of all of the studied locations, though they do not necessarily spend the most time overall traveling. Their complaints about the commute are more often about finding a place to park their car than about the traffic (although sometimes they encounter that). But even students who live relatively close to campus, technically within walking distance, spoke about driving, in part because they would not just need to get to campus but would then need to drive from campus elsewhere, in particular to work. Students who lived close by also drove because of safety concerns—the UNC Charlotte campus is not in a terrifically walkable part of Charlotte, and it is easier to navigate by car than on foot.

Perhaps not surprisingly, the non-residential campuses had the highest range of distance travelled of all the campuses, although not median distance traveled. They fell well below the urban commuter campuses in time spent commuting. Based on text messages, students at the non-residential campuses spent more time working and less time studying than other campuses. Many of the themes for the urban commuter campuses (see next section below) were echoed by non-residential students.

Centrality of libraries

For non-residential students, this distribution across the city also results in many of the students clustering their time on campus, so as to cut down on the days per week they have to travel. When students

are on campus, they speak about staying all day and when they plan to come to the library they intend to spend many hours, in part because they have to go to the effort to drive and find a place to park and do not want to make several back-and-forth trips (and risk losing their parking space). Students who valued quiet as a part of their productive study spaces would choose the library if it was a contrast to a lively noisy (shared) home, but would choose studying at home over the library if they had a private room or lived alone. When driving to and parking on campus is perceived to be an inconvenience, students will make the decision to stay home, even if it is not the "perfect" place to study.

Commuting time and the relationship of residency to campus life

This study brings up questions of what libraries can do to help students, especially regarding commute time (which is often driving—not allowing for study time as public transportation commuting might), and associated issues such as finding parking. Commuter students are in an odd limbo between distance students (who never come to campus) and residential students (who live on campus). This might point to a particular need to have effective digital places and services, as circumstances well beyond the library's control might determine a student's decision to stay home instead of braving traffic, and not have to worry about or pay for parking.

Insights from Urban Commuter Campuses

CUNY is a highly urban commuter institution with campuses across New York City. An important demographic to keep in mind is that 39% of CUNY students have household incomes of less than $20,000/year; in the community colleges, this figure is close to 50%.[5] Financial constraints can mean that CUNY students are often forced to make difficult trade-offs. The trade-off could be time for money: spending a couple of hours in the library scanning pages because you cannot afford to buy the textbook. Or it could be having no personal, private living space because you have to share your apartment with several other people.

Implications of living at home

Most of the urban students in this study live with family, some with roommates. It is not unusual to hear of five family members in a one-bedroom apartment, or two related families living in a two-bedroom apartment. This means all spaces at home are common spaces, even bedrooms, where multiple family members sleep. For example, one student shared a bedroom with her brother and grandmother. Given this, it is not surprising that these urban students spoke more about family and relationships than did participants from the other colleges.

While some students managed to do some studying at home, many more cited the distractions caused by siblings, parents, or children of their own, and lack of space as deterrents. If studying did happen at home, it occurred in a common space, such as a kitchen or living room, as well as in bedrooms shared with other family members. Lacking a private space for studying, students talked about knowing or feeling they should study while they are at home, but in the small space of their apartments, they could not avoid distractions such as TV, video games, or interacting with family members.

Living with family also meant sleep patterns were disrupted—going to bed late, getting up early to get time in the shared bathroom, preparing breakfast for other family members, or getting a child ready for their day. Urban students are often tired and stressed.

Centrality of libraries

For these students, libraries can be a refuge. The majority of students preferred libraries over other locations for studying (and sometimes sleeping), most often citing quiet and calm. Many of our libraries have quiet areas and not-so-quiet areas. Most of the urban students sought out the quiet areas in the libraries. One student preferred the library "because everybody else is so studious and studying, it puts me in the mood to also study and, um, focus." This is in contrast, of course, to home environments where everyone else is not studying and often engaged in other distracting activities.

Students also have a marked preference for cubicles or carrels over tables in the libraries. Contrasting with the lack of their own space at home, library carrels provided that space: a carrel of one's own. Students stated about the carrels: "I just have my own space" and "I have like my own little room. I can put my things around." For some students, open tables for studying were yet another space they had to share. Describing studying at tables, one student commented, "I don't feel like I have my own space to study. It feels like too many disruptions." This

is reminiscent of how students talked about their home spaces.

While enrollment has increased at CUNY, the size of our libraries has most often not seen a concurrent increase, and students mentioned overcrowding in the library as a problem. Even when that was the case, the library was still a central workspace for students.

Making the best of use of commuting time
Another workspace for urban students is their commute. The urban students in this study traveled by bus, express bus, subway, suburban rail, and car (usually a family member picking them up from a subway or train station). Commuting often involves transfers—bus to subway, subway to subway, train to subway. Students expressed frustration with the time spent commuting, as well as crowds on the commute. In fact, one participant took the subway a few stops in the opposite direction of her home in order to get on at a station where she could get a seat.

Urban students try to study on the commute to recoup the time if they can. The most common activity for students was reading; they also reviewed their notes. From other studies, we know some are also typing their assignments on their phones while commuting. As one student said, "First time in college, I didn't realize how difficult it would be for a college student to study, so like, I figured instead of listening to music and having my headphones plugged in, I'd rather study on the subway. I noticed how my grades improved since I've been doing that... I study, like, whenever, because I'm working also, and it's just very hard to study."

Even with the problems of commuting, some students will intentionally commute to campus including when they do not have classes in order to find an appropriate study space, often in the library, because home is not conducive for their academic work.

Task layering
We have a tendency to look at our students *only* as students. But they are not just students. This research helps us see the whole person, a person who is a friend, employee, daughter, grandson, parent, sister, cousin, as well as a student. Commuter students, both urban and non-residential, are frequently negotiating and navigating these identities throughout their day.

The complexity of these identities means they are constantly layering tasks. They are studying on the way to work or on the way to pick up their little sister from school. They are completing an assignment as they help their child do his homework at the kitchen table. They are posting to a discussion on the learning management system while working at their job. They are responding to a text message from their child's daycare while in class.

Next Steps and Recommendations

The Day in the Life Project has produced a large and rich dataset, and considering all of this leaves us with questions, of course. What are we doing to support the whole person before us? When we look holistically at students' lives, what can we do or change to support all of their identities? What does the information we learn about their lives tell us about the services they need?

We are continuing to explore the data collected during this research, both individually at our own campuses and together as a project team. Our focus in this paper has been students' movements and activities throughout a typical school day; there is much more to learn from our coded student interview transcripts and from the data on students' affect that was recorded by the SMS messaging survey. Our future plans include identifying additional themes and comparing them between all campuses. We are also working to implement changes in our libraries and on our campuses based on what we learned in this research. When planning improvements to library spaces and services we often turn to other libraries for ideas about what is desirable; this project emphasizes the importance of research with our own students, to learn about what our students distinctively need.

Endnotes

1. Henry D. Delcore, James Mullooly, and Michael Scroggins, *The Library Study at Fresno State* (Fresno, CA: Institute of Public Anthropology, California State University, Fresno), 14.

2. All ADITL Protocols were approved by the IRBs of the participating universities, with IUB acting as the lead university (Protocol #1506148767, Principal Investigator, Andrew Asher).

3. Sending and receiving survey responses was automated using the SMS functionality of the Qualtrics online survey software platform.

4. Michele J. Hansen, "Understanding IUPUI Students" (IUPUI, Institutional Research and Decision Support, November 19, 2014), http://irds.iupui.edu/Portals/SDAE/Files/Documents/IUPUI%202014%20Students%20INDY.pdf.

5. CUNY Office of Institutional Research, "Fall 2015 Profile of CUNY Undergraduates," http://www2.cuny.edu/wp-content/uploads/sites/4/media-assets/ug_student_profile_f15.pdf.

Appendix A

ADITL Text Message Survey Questions

Where are you? Please be specific.

[Open Response]

What are you doing?

- ☐ Attending Class
- ☐ Studying or other academic work
- ☐ Working
- ☐ Family, Social, or Recreational Activities
- ☐ Commuting
- ☐ Eating
- ☐ Other _____

How are you feeling?

- ☐ Very Happy
- ☐ Happy
- ☐ Neither Happy nor Unhappy
- ☐ Unhappy
- ☐ Very Unhappy

Appendix B

ADITL Debriefing Interview Guide

The ADITL debriefing interviews are designed to be semi-structured and open-ended, and the interviewer may add additional questions or follow-up questions as necessary. These questions should therefore be understood as a framework rather than a script.

1. [Show student the map of their day] Please walk me through your day from beginning to end. [Follow up as needed for specifics about each location and why the student traveled there.]
    a. Why did you go to [location]?
    b. How long were you there?
    c. What were you trying to do or accomplish while you were there?
2. What time does your day start?
3. What time do you go to campus?
4. How do you get to campus?
5. How long does it take you to get to campus?
6. Where do you study?

7. Why do you like studying there?
8. On this day you studied at [location]. Why did you choose to study there?
9. How much time do you spend studying on a typical day?
10. How many classes do you have?
11. How many hours per day do you spend in class?
12. Do you work in addition to attending the university?
13. Where do you work?
14. How far is it from campus?
15. How do you travel to work?
16. How much total time do you spend commuting on a typical day?
17. What kinds of extracurricular activities do you participate in?
18. Do you live on campus or off campus?
19. What time does your day usually end?
20. You indicated that you felt [happy/unhappy] at [location]. Why did you feel that way?
21. What was the most frustrating part of this day for you?
22. What was the best part of this day for you?
23. What do you like the best about [student's campus]? What do you like least?
24. What are the most difficult things about studying at [university]?
25. How did you choose to attend [university]?
26. What is your major? How did you decide to study [major]? [If undeclared: How will you decide on a major]?
27. Is anything missing from the map? What?

Lead Users: A Predictive Framework for Designing Library Services and Spaces

Ameet Doshi
Georgia Institute of Technology, USA

Elliot Felix
brightspot strategy, USA

Introduction

The purpose of this paper is to describe the mix of qualitative and quantitative methods applied at the Georgia Institute of Technology Library as part of the Library Next project. Library Next refers to a transformative reimagining of library services, spaces, infrastructure, technology, and operations now in process at Georgia Tech. This paper will focus on the user research and service and space design process developed by brightspot strategy and coordinated by both brightspot and Georgia Tech Library during 2013–2014.[1] In particular, the paper describes how we applied Eric von Hippel's "lead user" approach to identify opportunities for future innovation in designing new library services.

Designing for a Changing Context

As we began the Library Next project, we identified the larger trends that were driving change at Georgia Tech Libraries and how we would respond. We called these the future service directions and they set the context for the project. We began by recognizing that the majority of library visits and information are online and that more information is created and shared digitally. So, we decided to think about the library as primarily online, with physical space complementing it. Conversely, we then also determined that, by moving physical collections off-site to the Library Services Center, making online resources, tools, and services more visible will be even more critical to the library's operations—the more digital things become, the more place matters.

These shifts then led us to define the broad service directions that informed the service and space program design process. First, the library sought to be involved earlier and longer in the research process and connect people to the "whole universe of information," beyond what is available at Georgia Tech. Second, the library saw the need to get outside their building to "push" services out to advanced users (e.g., grads, faculty) while continuing to "pull" users (e.g., undergrads) into the library. Third, the library recognized that it would be critical to do more community engagement and outreach to make everyone aware of research, teaching, and learning activities happening on campus through exhibitions and events. Fourth, helping users acquire, curate, analyze, visualize, store, and manage is essential. Fifth, the library sought to incorporate more technology-rich spaces and tools, e.g., visualization labs, maker spaces, multimedia studios, prototyping tools, retrocomputing, and audio and video recording studios. Finally, in doing all this, the library wanted to help users help themselves, e.g., self-checkout, self-serve hold shelf, and improved quick search online.

From this direction, we developed a vision statement for the libraries that we used to guide our interactions with users, what spaces to provide, what services to offer, and how to deliver them. The library's vision is to: "define the technological research library of the 21st century, enabling people to explore the past and design the future, by bringing together inspirational spaces, curated content, expert guidance, and scholarly communities."

Our Hypothesis: Work with Lead Users to Predict the Future

Libraries of all types and sizes are asking the same question: "How can we anticipate shifts in user needs and preferences?" There are many ways to answer this question: institutions can look at quantitative trends, consult with outside experts, look beyond their industry, talk to users and staff, or perhaps consult a crystal ball. Because we see that within

academic libraries—anticipating future needs are of particular significance as many of the mid-century library facilities on college campuses reach the end of their useful lives—we decided a rigorous approach to engaging specific users and staff would be the best approach. Concurrent with this trend are often precipitous declines in print collection circulation, coupled with increased demand for new user spaces and services. At Georgia Tech, an opportunity arose to manage the legacy print collection for the long-term via a unique public-private partnership with Emory University Libraries, resulting in a singular opportunity to transform the aging library facilities around user spaces and services, and less around underutilized print collections.

Eric von Hippel and "Lead User" Theory

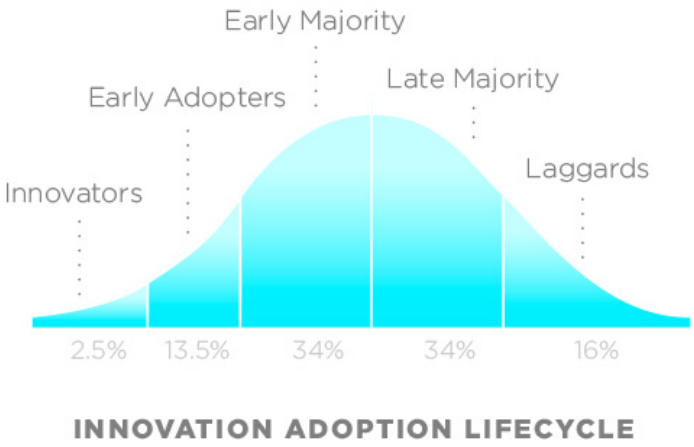
In trying to answer the "what's the future" question, we based our design method upon the work of Eric von Hippel, an economist at MIT and author of *Democratizing Innovation*. Von Hippel is perhaps most well known for coining the phrase "lead user" and defining the methodology by which firms are able to identify opportunities for transformational innovation in product design. In *Democratizing Innovation*, von Hippel notes that upwards of 40% of users make some effort to modify, improve upon, or "hack" their product.[2] His research also suggests that lead users are often prepared to "freely reveal" their innovations, thereby contributing to the growth of the information commons. This "free reveal" behavior is particularly evident in the open source software community. Early evidence of von Hippel's examination of lead user behavior includes an interesting case study in Australian libraries. In 2000, von Hippel, Morrison, and Roberts conducted a study of OPAC adoption and integration in Australian libraries. This was at a pivotal point during the overall adoption lifecycle for library OPACs. Most library systems offered by vendors possessed a rudimentary functionality, but users (in this case, systems librarians) were increasingly seeking more features in order to improve the OPAC experience for their end users. Of the 102 libraries that responded to the study, the researchers found that a quarter (26%) made some adjustments above and beyond those built into off-the-shelf systems by vendors. Furthermore, those lead user improvements were generally viewed favorably by the vendors themselves, with 70% of the improvements made by lead users considered of medium or greater significance to firm managers.[3]

Another case study also illustrates the power and impact of lead user innovations on the marketplace. The CamelBak is a commonly used lightweight hydration device that allows runners, cyclists and other athletes to stay hydrated without stopping, slowing down, or awkwardly tilting their head to drink while in motion. This now-ubiquitous device was first developed by a lead user, Michael Edison, who also happened to be both a paramedic and a distance cyclist. Edison could not find a product that met his unique needs in the marketplace, so he developed a prototype of the CamelBak from surgical tubing and an IV bag sewn into his shirt.[4]

Method

Our method for the Library Next user research project consisted of applying the lead user approach described by Eric von Hippel and further informed by the work of Everett Rogers. Rogers is a sociologist from Iowa State and coined the phrase "early adopter" in his seminal work titled *Diffusion of Innovations*.[5] We applied his "curve of adoption" as a way to segment our user community for the purpose of future space and service design. We defined our lead user population based on Rogers' curve, and our goal was to identify and engage those innovators and early adopters (the first 15% of the curve).

Figure 1: Everett Rogers Technology Adoption Lifecycle



In summary, our methodology consisted of identifying lead users, deeply understanding their research, and teaching and learning lived experiences with an eye towards workarounds as well as identifying unmet needs. We also conducted campus surveys and hours of observation, and then worked with the design team to cocreate program spaces and services to anticipate where their research, teaching and learning is headed at Georgia Tech.

Identifying Lead Users

Von Hippel recommends a stepwise approach to identifying lead users in any market.[6] First, consider a major trend that is impacting library operations. For example, this could be an increasing need for collaborative spaces with access to power and data. Next, brainstorm the possible lead users within that market who may be deeply familiar with that trend of increased collaboration. This could be a group of "regular" library users from an honors undergraduate design-oriented course requiring teamwork. The two key factors to keep in mind in identifying lead users within your library communities are:

- identifying individuals or groups with needs that are at the leading edge of the trend, and
- identifying individuals or groups who possess a high incentive or motivation and resources or abilities to develop solutions for their needs.

Lead Users: External and Internal

The Georgia Tech Library manages three highly-engaged advisory boards (undergraduate, graduate, faculty) who provide direct student and faculty input to the library's senior administration including the dean. Areas of input include consulting on the library's digital programs, services, collections, renovations, and marketing efforts. The popular commons renovations in the Georgia Tech Library over the past 15 years (Library West Commons, Library East Commons, and 2 West Commons), as well as a number of the library's web services, were influenced by participation from Board members. These Board members provide a natural source for lead users and were relied upon for insight and guidance throughout the user research process. Also important to this approach are identifying *internal* lead users, particularly for those institutions who find it challenging to maintain dedicated advisory boards or identify other means of engaging external lead users. These internal lead users are defined by Schweisfurth as employees who also happen to be heavy users of the company's products or services.[7] These internal lead users are different than other employees in the firm because they exhibit many of the same characteristics as external lead users (awareness of the leading edge of trends, solution-oriented affect, and motivated to develop workarounds). So it is entirely possible, and even likely, that your lead users have already devised innovative workarounds to solve their needs. How can librarians and library administrators leverage this innovation?

Data Gathering Techniques

We employed a variety of qualitative- and quantitative-based data gathering techniques to deeply understand the lived experiences of Georgia Tech's lead users and also better recognize the

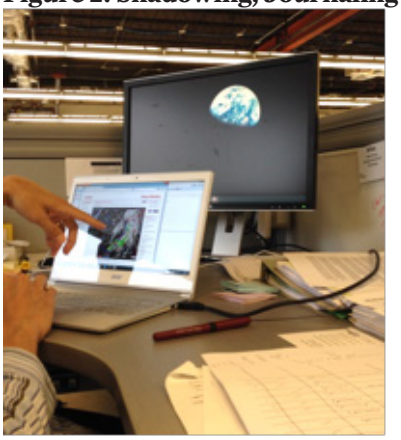
tectonic shifts occurring across the landscape of higher education. User engagement methods for collecting data from lead users included, but were not limited to, the following:

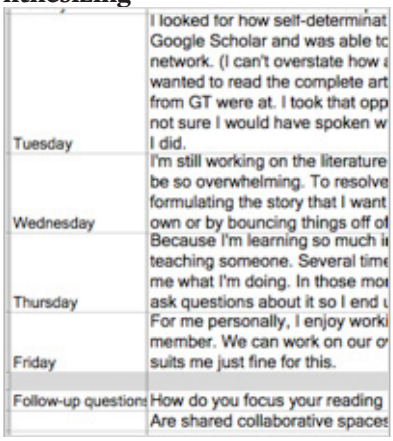
- Individual Interviews
- Journey or Experience Maps
- Shadowing
- Journaling
- "Headlines" Activity

We held 25 interviews with individual faculty members and postdocs, and 13 interviews with graduate students from 23 Schools and all six of Georgia Tech's Colleges.[8] Each interview lasted approximately 30 minutes and was aimed to better appreciate the "pain points" and subsequent workarounds by faculty and graduate students who operate at the forefront of their respective fields. It is important to note that the interviewers did not explicitly ask any library-related questions until later in the interview, and in some instances, not at all. This was intended to understand the faculty and student lives in a more holistic way, without focusing too intently upon the library. In many instances, opportunities for the library to solve a lead user need emerged, as is further discussed below in the results section.

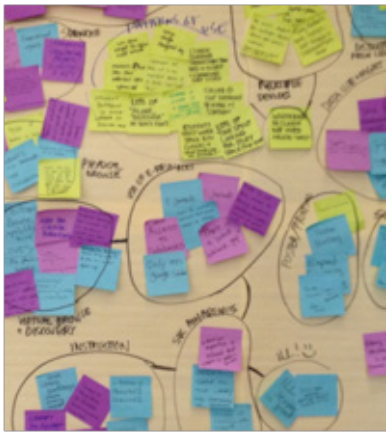
Another technique applied during the project involved Journey Mapping. This technique involved primarily internal lead users from the library and a few associated non-library units. Participants were asked to develop maps of how users accomplish relevant and significant tasks related to teaching, research and learning. For example, if a faculty member decided to "flip" their course, what steps would be required from inception to execution? What types of affordances would be needed: expertise, software, hardware, furniture?

Figure 2: Shadowing, Journaling Synthesizing





	I looked for how self-determinat Google Scholar and was able tc network. (I can't overstate how a wanted to read the complete art from GT were at. I took that opp not sure I would have spoken w I did.
Tuesday	
	I'm still working on the literature be so overwhelming. To resolve formulating the story that I want own or by bouncing things off of
Wednesday	
	Because I'm learning so much i teaching someone. Several time me what I'm doing. In those mor ask questions about it so I end u
Thursday	
	For me personally, I enjoy worki member. We can work on our o suits me just fine for this.
Friday	
Follow-up questions	How do you focus your reading
	Are shared collaborative spaces



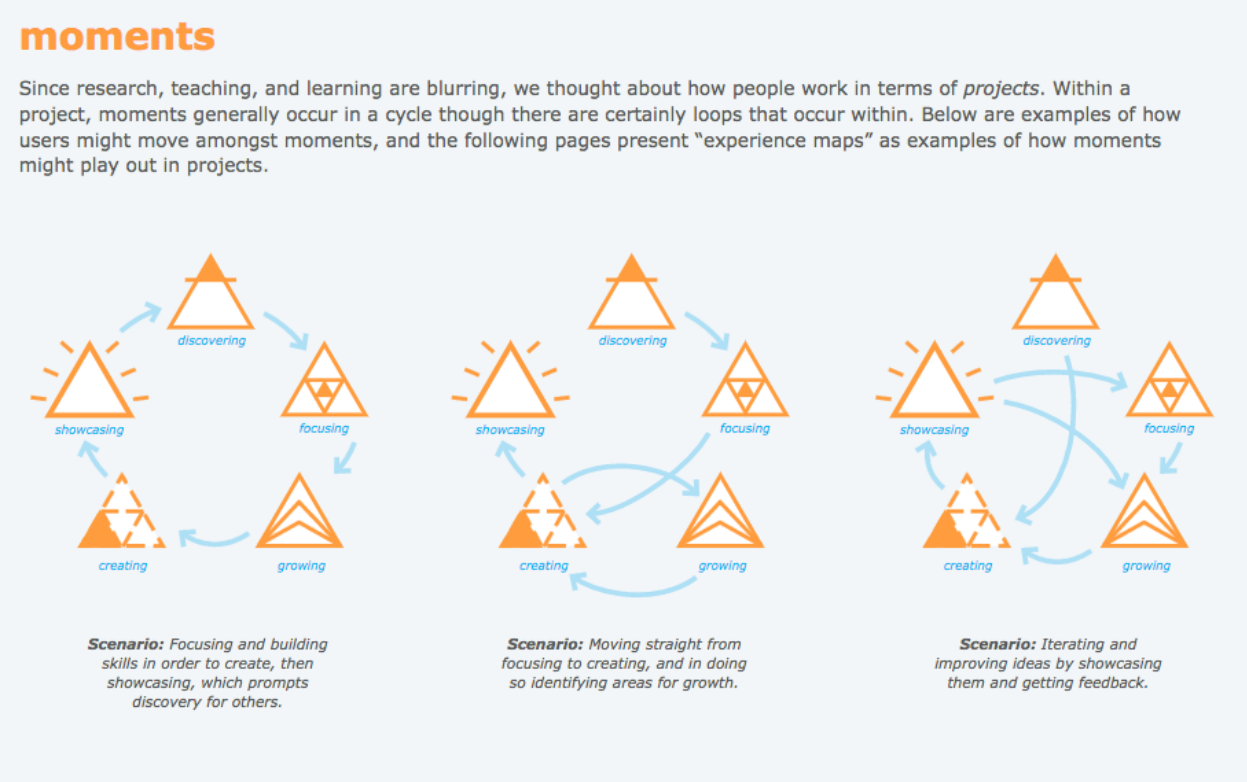
Georgia Tech Library and brightspot strategy

Results

Based on the data gathered we developed a user experience model that addresses the "lived experience" of the faculty and graduate lead users at Georgia Tech. This user experience model describes five "moments," which can be thought of as goals that users are trying to achieve within their research, teaching, and learning experiences:

- Discovering: Finding the right information, content, people, and tools
- Focusing: Filtering information and identifying what is next
- Growing: Mastering new skills and building relationships
- Creating: Expressing and applying ideas
- Showcasing: Testing and sharing with the community

Figure 3: Moments



Georgia Tech Library and brightspot strategy

The following describes five notable instances when a lead user's workaround represented one of the five "moments" and, ultimately, developed into a new service or space in the library.[9]

Discover: Digital Media and Scholarship Commons[10]

We found that even at the undergraduate level, lead users are attempting to discover new modes of visualizing and communicating their work. In this instance, the lead user was a member of the library's student advisory board and a chemical engineering major seeking to visualize chemical engineering data. There exist many visualization spaces on campus but they are typically housed in secure departmental labs, so we designed a suite of spaces and services available to everyone in order to support digital scholarship, whether through visualization, high performance computing, or even retro-technologies.

Focusing: Consultation Zone/Research Navigators[11]

It is now commonly known that stores such as CVS and Walgreens offer basic medical services such as flu shots. However, it was not that long ago that the entire business model for this industry rested in the pharmacy and drugs delivered to the customer within their stores. This is a useful exemplar of a sector that has radically transformed in relatively short order to be involved "earlier and longer" in providing healthcare for their customers. In speaking with doctoral lead users and early career faculty, we also detected an opportunity to be involved "earlier and longer" by more proactively supporting faculty research grants, and also helping doctoral students to focus on emerging trends for possible dissertation topics. This level of proactive service requires making active, stronger connections with campus research support units such as the Office of Sponsored Programs. We also designed a space for librarians to meet with faculty in a semi-public setting. This type of visible and proactive service and space makes the work of librarians, formerly conducted almost entirely in private offices, far more public within a new, highly anticipated (and utilized) library facility.

Growing: Teaching Studio[12]

We interviewed a public policy professor who is one of those innovators from Everett Rogers'

Curve of Adoption (she is part of the 2.5%), and is among many Georgia Tech faculty seeking to "flip" their instruction. This faculty member engages in problem-based learning and through both interviews and observation, we were able to gain a rich understanding of her workarounds as well as the challenges of trying out new teaching and technologies "on the fly." So we created a place for her to grow and develop her experimental teaching methods before going "on stage" in the classroom.

Creating: Innovation and Ideation Studio[13]
"Design Thinking" has become a common buzzword across all disciplines—no longer relegated to just schools of architecture. We detected a trend among lead faculty users that they were integrating design thinking principles into their curriculum. In addition, inspired by the winners of the student innovation award at Georgia Tech (called the "Inventure Prize"), we designed an Innovation and Ideation Studio with the modeling materials, spaces, and affordances to support design thinking across the disciplines. The Innovation and Ideation Studio is a place that allows students the capacity to create. In interviewing the undergraduate winners of Georgia Tech's prestigious and competitive innovation contest we learned about furniture, layout, services and materials to help Georgia Tech students create their next invention, idea, or innovation.

Showcasing: Scholar's Event Network[14]
We interviewed one of the most popular and engaging professors at Georgia Tech. This teacher connects literature and engineering in his classes. For example, one of his classes recently built a replica of Henry David Thoreau's house at Walden after reading the text and using only the tools available to Thoreau in 1854. We found that he often struggles to locate a suitable space on campus to display the work and also have his students present about their process in a public forum. So we designed a space with a large enough volume to accommodate this kind of creativity and also included an integrated network of presentation spaces.

Conclusion

The method described will only get you so far. Putting it into practice relies on a particular mindset of agile prototyping and a skillset of developing a deep empathy and compassion for the lead users—both of which are often espoused by champions of "design thinking." The prototyping mindset is one that recognizes failure through trial and error as the critical path to success. So, rather than want to have perfect information about a problem and the perfect solution, you must try a thing out, measure success, and adapt as you learn. The empathy skill-set relies on having the right mix of social-emotional skills and is critical to creating that two-way conversation with your lead users: understanding their motivations, behaviors, expectations, and limitations to such an extent that you can see and experience the world—or a space or service or technology—through their eyes.

Equipped with empathy and a willingness to try things in the face of risk and uncertainty not only enables you to engage lead users to predict the future; it makes your work more productive and fulfilling as well. Practicing this, you can better understand the people you are trying to help. You can more consistently help them. You can tell better stories about who you have helped and how so that you can have an even greater impact. And, by applying a leaner, more agile mindset you can change the conversation about your work and its results from asking people to support an unproven aspiration to enlisting them in scaling up your success.

After that, what is next? Getting the mainstream to adopt what lead users are already doing. Fortunately, in addition to shaping how we think about innovation in terms of segmenting adopters along a curve, Everett Rogers also identified the five core criteria people generally consider when deciding whether or not to adopt a new idea: observability, trial-ability, complexity, compatibility, and relative advantage.[15] Libraries can use these five criteria as a checklist of sorts for their new initiatives. Librarians can be sure they: find ways for people to try out what they are proposing, see others doing it, make their idea easy to understand, communicate how it relates to what is happening today, and make a compelling case for how it is better than the status quo.

Notes

1. "User Research: Part 1," Georgia Institute of Technology Library and brightspot strategy, accessed December 12, 2016, http://www.library.gatech.edu/about/docs/part1.pdf.

2. Eric von Hippel, *Democratizing Innovation*, 1st MIT Press Paperback ed. (Cambridge, Mass.: MIT Press, 2006).

3. Ibid.

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5. Everett M. Rogers, *Diffusion of Innovations*, 5th ed. (New York: Free Press, 2003).

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9. "User Research: Service Design Report," Georgia Institute of Technology Library and brightspot strategy, accessed December 12, 2016, http://www.library.gatech.edu/about/docs/GT-Library-Service-Design-Overview.pdf.

10. Ibid., 43.

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12. Ibid., 33.

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15. Rogers, *Diffusion of Innovations*.

From Data to Development—Using Qualitative Data to Create Ideas and Solutions

Åsa Forsberg and Ingela Wahlgren
Lund University, Sweden

Abstract

During autumn 2015 we conducted a large qualitative user study on our library as a learning space. The purpose of the study was to find evidence regarding user needs in order to be able to make well-informed decisions for a development project.

This paper will discuss both the usefulness of qualitative methods in understanding students' and researchers' needs and requirements when using the library, and how you can work with the collected data as a base for development.

Introduction

Lund University is the second largest university in Sweden, with around 41,000 students and 7,500 employees. It is organised in eight faculties and each faculty has a library unit. The university library is the largest library unit with 100 staff members, but it is not part of a faculty. It is a both a legal deposit library and an academic library.

The present library building was constructed at the beginning of the 20th century. Since then it has more than doubled its size through several extensions. The library has around 500 study places, both in traditional silent reading rooms and in more open spaces. One of the consequences of the many reconstructions is that the public space is difficult to understand and find your way in. It also has problems with acoustics and light. Another problem is the location of the open collections. They are too large to be held on the entrance floor; therefore the reference collection, which is not extensively used, is placed on the entrance floor, and the heavily-used open stack collection is located on the third floor.

As a legal deposit library, with collections of the Swedish print since the end of the 17th century as well as rare books and manuscripts, the library has a focus on preservation, which also affects the public space. For instance, no food is allowed in the library and a large part of the collection is only available by in-house use.

Due to these facts, and in order to meet changes in the research and education at Lund University, it was decided to develop a proposal to improve the public space.

The task was given to the Library Services Unit, a small unit with five staff members (including the authors of this paper) who work with library space, reference services, and teaching activities. The unit formed a project team to accomplish this task.

During autumn 2015 we conducted a large qualitative user study of the library as a learning space for students and researchers. The purpose of the study was to find evidence regarding user needs in order to be able to make well-informed decisions for the development project.

Design and methodology

> The project was a wake-up call. We saw over and over again how much we did not know about our students and their academic endeavors. But, perhaps more important, we saw how often our personal assumptions about the students, which have guided years of decisions, were incorrect.[1]

The study incorporated several different methods. Some were of the user experience (UX) variety: cognitive maps, touchstone tours and observations. Other methods were focus groups and individual interviews. We also analysed the comments in a recently conducted LibQUAL+® survey and on a graffiti board in the library.

The target groups of Lund University Library are students, researchers, and the general public. Since the study concerned the library as a learning space, we chose to focus on students and researchers.

Interviews
We used several interview methods to collect data and input from end users.

Focus groups
The focus group method was originally used in marketing, but has become quite common in social sciences, including library and information sciences (LIS). A focus group is a group of people discussing a specific topic. We wanted to use the method since it allows participants to interact with each other, and not only with the interviewer. This method is also often used in combination with other methods.[2]

Since the project consisted of several different qualitative studies, we decided to do only two focus groups, one with researchers and one with students. According to the literature it is possible to use smaller groups when the participants have a lot of involvement with the topic,[3] as in our case; even so it was quite difficult to recruit enough participants, and we also had some last-minute dropouts. We finally ended up with only three participants in each group (one of the researchers who could not make it to the focus group participated instead in an interview; see below). The focus group sessions were around one hour each, and one moderator and one scribe/observer from the project team participated. The sessions were transcribed.

The main topic and the questions asked were the same for the two focus groups, focusing on the participants' reflections on criteria for a good and sustainable environment for study and research. We encouraged the participants to think outside of the library, which the student focus group mainly did. In the focus group with researchers, however, it was very difficult to broaden the discussion and talk about good study places in general as the participants preferred to talk about the public space in the university library. They were also quite biased toward the content of and access to the collections.

The different approaches in the two focus groups may be due to the recruitment processes; the researchers were recruited by posters in the physical library and on our websites, while the students were mainly recruited through contacts with the student unions. Consequently the researchers were regular visitors, and heavy users of the collections. Two of the students rarely used the library.

Semi-structured interviews
A semi-structured interview has predetermined questions but is flexible enough to adjust the questions according to the situation, and the questions are open enough to prompt discussion.[4]

For a couple of weeks during the project time, a student in library and information science did vocational training in the university library. The student conducted interviews with 10 students studying in the library, mostly individually but in two cases with a pair of students. According to the literature it is important to build rapport with the interviewees,[5] and we assumed that, as a student, he could more easily create an environment in which the interviewees felt more relaxed. The topic of the interviews was how the students experienced the learning space of the library, and they were also asked to describe the space. Some of the findings, discussed below, were quite eye opening.

We also conducted a semi-structured interview with a researcher, who was unable to attend the focus group.

We did not record and transcribe the interviews. Instead, notes were taken during and immediately after the interviews, and these notes were analysed.

Workshop with library student assistants
The university library employs library student assistants to staff the combined reference and lending desk in evenings and on weekends. We conducted a workshop with eight student assistants, who worked in two groups with two broad tasks: (1) describe the perfect study environment, and (2) list the positive and negative aspects of the university library learning space.

The student assistants were very engaged in the task, and could contribute two perspectives, since they are both students who use study places in this capacity as well as workers in the library, thus having deeper knowledge about it. They discussed the topics, and wrote and drew on large flipchart sheets.

LibQUAL assessment in 2014—analysis of general comments made by the users of the university library
In 2014 the Lund University Libraries conducted a LibQUAL-assessment. Lund University students and staff members were asked to answer the LibQUAL questionnaire. In our project we analysed 156

open comments concerned specifically with the university library.

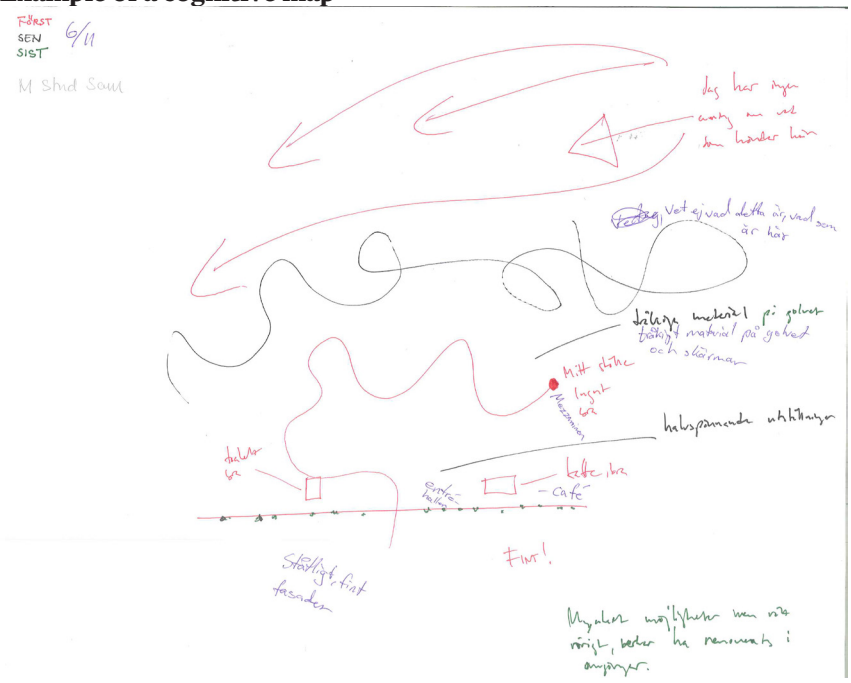
UX methodology

UX, or user experience, is typically associated with web interfaces and testing and designing those so that they are user friendly. A library space is also an interface as it connects a library user to the services of the library. If the interface does not function well, and is not pleasurable to use, the user will not enjoy using the library. Therefore many libraries have started using UX methods in recent years to assess the functionality of their spaces. One of the authors of this paper had the opportunity to attend the first UX in libraries conference in Cambridge, England, during spring 2015, and in the following paragraphs we will describe in more detail the specific UX methods we chose to employ as a consequence. To learn more about UX methodology and its use in library settings, see for example *User Experience in Libraries: Applying Ethnography and Human-Centred Design*, edited by Priestner and Borg,[6] who also organised the aforementioned conference.

Cognitive maps

Cognitive mapping has been used by other academic disciplines and in other contexts since the middle of the 1900s,[7] and has in recent years also been introduced as a method for exploring the users' experience of library spaces or learning environments, as seen for example in the work by Mark Horan from 1999.[8] There are many different ways of doing cognitive mapping. In our case we chose to let library users draw their mental image of the library on an A3 piece of paper, using three different coloured pens, changing pens every two minutes. That way we could see what the participants had drawn first, second, and last, the assumption being that the participant draws what is most important to him or her first. After the allocated six minutes of drawing were up, we also talked to the participant for about ten minutes about their map or image, asking them to explain what they had drawn, and then also taking care to take note of the words used by the participant to describe different items in the library. For example, the combined reference and lending desk was most often talked about as the "reception desk." We did ten maps in total, four with researchers and six with students. We recruited all of them by simply asking people who were using our study spaces and our reading room for participants. We did make sure, though, that we had a gender balance and also had some participants who were not Swedish speakers. As with all our methods that asked for time by participants, we offered cinema tickets as an incentive.

Example of a cognitive map



The cognitive maps required some extra time for analysis, compared with the other UX methods we used. First of all we listed the specific items or places mentioned or shown on the maps, adding items that we were interested in seeing if they were represented on any map. We then counted the occurrences and compared the number of occurrences with the number of possible occurrences, and also divided the number of occurrences with the number of participants, to create a relative index. We also created a temporal index, using the different colours on the maps to understand when something had been drawn. The assumption here is that if something is drawn early on, that means it is more important to the participant than something that is drawn last, or not at all. One has to be careful when interpreting cognitive maps though, and take into account that many different aspects can influence a participant to draw or not draw a certain object or spot. Most of our participants, for example, drew the combined reference and lending desk during the first two minutes. However, our desk is placed right in front of the entrance to the library, and quite close to it as well, so it is very hard to miss. That means that participants might have drawn it early on, without that meaning much more than that they have noticed where it is located. It does however also make it that much more noticeable and noteworthy that one participant did not draw the desk at all and that another participant drew it during minutes 2–4.

Touchstone tours

So-called touchstone tours are a form of contextual inquiry,[9] whereby you investigate the context of the participant by visiting and/or interviewing him or her in his or her home or place of business. In our case, we wanted to learn how our library space worked for our users and therefore asked library visitors to "show us their library." The participant was asked to take the researching librarian on a tour of the library and visit the different touchpoints that the participant usually interacts with when visiting the library. During most of our tours we recorded audio and also took photographs to document the different touchpoints. The participant was asked to talk about the different places, or touchpoints, where he or she interacts with the library or spends time when he or she is at the library and we asked follow-up questions when relevant. Most of the tours took about half an hour to complete. We conducted four tours with more or less randomly picked participants that were approached as they were walking through the door, though we did aim for, and achieved, a gender balance.

We also conducted another tour that differed from the others. Partly by design, but mostly by luck, we managed to do a tour with a first-time visitor to our library. She booked a book-a-librarian appointment and we then asked her if she wanted to let one of us tag along as she looked for books in our library. This tour took 45 minutes and gave us many insights into where the pain points in our library are for someone who tries to use the library for the very first time.

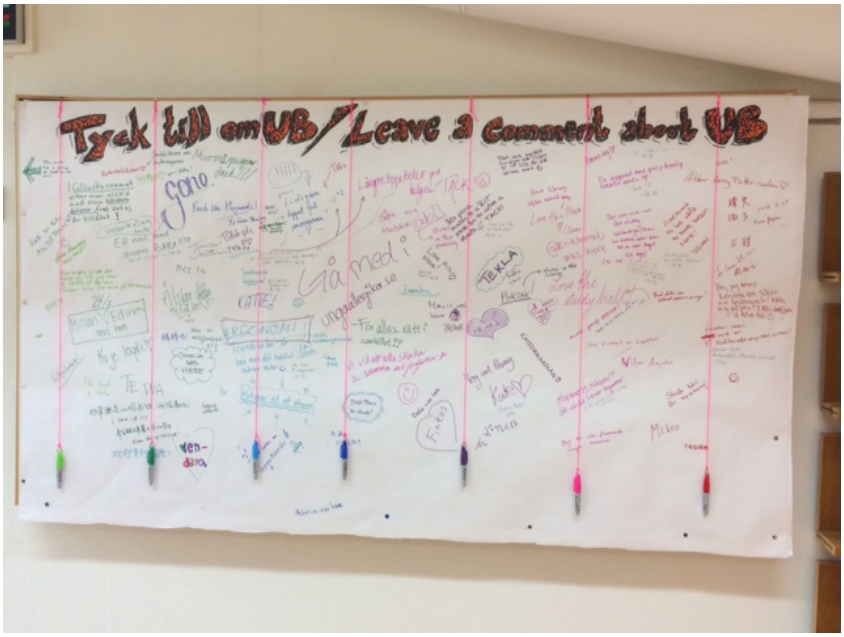
Observations

We carried out both qualitative and quantitative observations in our library space. We counted the usage of our public computers twice a day during a few weeks and we also carried out systematic observations of the usage of our quiet reading rooms and group study rooms, taking note of how many patrons were using laptops or other mobile devices. The qualitative observations were carried out by different staff members at different locations within the library and on different dates and times. These gave us insights into noise levels and the flow of people through the space, as well as the ineffectiveness of our information screen because of its placement.

Graffiti board

A few months prior to us conducting our research we put up a graffiti board in a well-trafficked area of the library (see image below). The graffiti board was an instant hit and has been so well used that we have kept it as a permanent feature in the library. Since we are using paper attached to a large notice board, we can easily replace the paper, and keep the used ones for analysis. When we analysed our other data we also included insights from the graffiti board up until that date.

Graffiti Board



Learning from theory and practice

The project team made a literature review focused on the library as a place for learning. The literature we used emphasised the importance of creating a learning space with flexibility and functionality for technical devices and collaboration. Another issue is wayfinding, which means to understand the functions in different types of spaces, such as creating different zones with different functions within the library. We also found research evidence for the importance of offering a good study environment, with good lighting, acoustics, ergonomic furniture, and access to drink and food. The library is the students' workplace, and they want to be able to access it at least during office hours, if possible 24/7.

Another important topic to cover was different methods to assess and understand the user experience of library space and learning space. One of the project members participated in the first UXLib conference, which was held in Cambridge, England during spring 2015.

For inspiration the entire library services team, together with the library's facilities manager, went on several study visits to other HE libraries, most of them in Denmark. These visits inspired some of the solutions we are proposing to solve some of the issues we found in our own library, but they also provided some insight into what not to do.

Analysing the data and ideation

We dedicated two days to analysis of the collected data and for ideation. We started by using the affinity mapping method for clustering the different issues and insights we found in our collected data. We divided the data between the five of us and extracted keywords and phrases from the data that described a problem, need, or issue. These insights were then clustered together based on some broader themes, like air quality/noise level, lack of power outlets/insufficient wireless network, and wayfinding/disposition of the library space.

We then moved on to the Six-Eight-Five method to generate ideas. Six-Eight-Five is a structured brainstorming method, where the participants individually and quietly take five minutes to write six to eight ideas on post-it notes and then post them on a board and briefly explain them to the group. This process is repeated several times; each time the participants may generate new ideas or further develop their own or their peers' ideas. The goal was to generate as many ideas as possible, big and small, and to avoid self-censorship. This method was very fruitful and there were a multitude of ideas when we started our next and final phase.

The ideas were sorted using the How-Now-Wow method, in a matrix according to if they are: conventional and easy to carry out (Now); innovative and difficult to realize (How); or innovative and easy

to realize (Wow). This method also helped us weed among our many ideas and the matrix was easily translated into a timetable for conducting small and larger changes to our library space. Our findings, suggestions, and timetable were presented to the library management during spring 2016.

How do the users experience the university library?

Our user studies showed that many users find our library difficult to navigate and unintuitive in terms of where different functions and collections can be found. The impressive facade also creates disappointment in our visitors, as the interior of the library does not match the facade very well, and the interior is perceived as quite uninspiring. The library has several floors and rooms that are closed to the public and this also seems to add to the confusion. It is difficult to understand where one is allowed to go and also what you are allowed to do, or what you are meant to do, in different rooms. In the LibQUAL comments we see that the library is seen as very large, confusing, and labyrinthine. The touchstone tour that we did with a first time user shows that not only is it difficult to find collections and functions, it is also difficult to find your way out!

The opening hours of the library are another recurring theme in our collected data. During term time the library is open from 9 a.m. to 7 p.m. on weekdays and 10 a.m. to 3 p.m. Saturday and Sunday. This seems to be inadequate for many users and they often suggest that we open earlier, close later, or that we should be open 24/7. Many users view the library as their workplace and want to work a full day, or more, without having to go very far for lunch or coffee. The wish for longer opening hours does not necessarily reflect a wish to stay longer than six or eight hours, but might indicate that users simply have a different rhythm and might want to come earlier or work only in the evenings.

Something that might seem trivial to staff, but was mentioned time and again by respondents were the state of our restrooms. Some of them are smelly, some of them are dirty, and some of them lack sound isolation, making them feel unsafe. The biggest issue, however, seems to be that most of them are hard to find; most of our users queue at the restrooms close to our entrance and never realise there are available toilets closer to where they are studying.

Our library building houses a café in its basement, which serves lunch, coffee and snacks during weekdays until 4 p.m. As the café closes before the library and is not open during weekends, many respondents wish for access to hot beverages at all times and many, especially students, want to be able to bring a packed lunch. As previously mentioned, food and snacks are not allowed anywhere in the library space.

Regarding physical aspects of the library space, users seem to have diverse needs when it comes to, for example, sound levels. Some prefer a truly silent space, some a quiet space, and some feel most comfortable surrounded by a little bit of noise. Everyone seems to appreciate being able to sometimes sit and read in a comfortable armchair, also in a quiet space. Many users express frustration that the library space is not more clearly marked or zoned off or that there is insufficient information in the various rooms about rules and the allowed noise level. Having sufficient reading light is also an issue. In general, there is insufficient lighting in most of our study spaces, both overhead lighting and desk lighting. Some of our respondents choose study space according to the amount of daylight coming in. There are also mentions of ventilation problems in some rooms and insufficient heating in the wintertime in one area of the building.

Another important piece of infrastructure that emerges as crucial in our studies is the seemingly insatiable need for power outlets, for laptops and for charging mobile devices. Some of the library study space simply lacks them; in other places they are awkwardly situated and they are often not very user friendly in our group study spaces. Since many users study in the library for long periods of time, ergonomics is also important. The library should have different kinds of seating to choose from and chairs should be adjustable to some degree. There should also be height-adjustable tables, so that users can choose to stand up and work. It is also important for users to have sufficient space when using a table. Just because users bring a laptop, that does not mean that they do not at the same time use an old-fashioned notepad as well as printed books. Users also wish to be able to leave their space for lunch or breaks without losing it; perhaps this also indicates that users do not feel that their belongings are safe if left as markers at a desk.

Finally there is an ever-increasing need for group study spaces. These also need to be designed so that the group using the space do not feel disturbed by others but also do not feel that they are disturbing others.

Outcomes

A learning process

The project has been a learning process for the library service team. We have worked with the project according to the principles of evidence-based librarianship and information practice (or, as some authors prefer the term "practice when based on qualitative studies, research based library and information practice"), and tried our best to keep the focus on the users' experiences, and how to improve these experiences.

The proposal

The proposed changes/improvements are based on the study undertaken during autumn 2015, in which we identified problems and generated ideas to solve these problems. The most important suggestions are:

- Activities to open up the library and integrate it better with the university
- Extended opening hours
- Best-practice study places, offering the technical and functional support needed for different study activities; offer a canteen where students can bring their own food and eat
- Improving wayfinding, by creating zones for different purposes and with different noise levels, from silent areas to group activity areas
- Improve the physical and virtual information and sign system
- Relocate the collections: move the open collection to the entrance floor to make it more accessible; in order to make place for the open collection, move the reference collection to the third floor
- Replace the combined reference and lending desk with smaller, open information points.

The proposal was presented to the library management in spring 2016. The management decided that it should be presented to and discussed by all staff members before making any decisions on how to continue the process to develop and improve the library's public space.

Accordingly, the project team arranged a series of workshops and meetings open to all staff members. We also offered a virtual notice board where colleagues could post comments, questions, and ideas about the proposal and the public space.

This feedback was reported back to the management in May. From the reactions from the management and the staff members we learned that the content in the proposal to develop the public space was more controversial than we had anticipated. In the discussions about the proposal on different levels and groups, it has become obvious that the organisation has different views and understanding of the university library's mission, its *raison d'être*. For some staff members, the university library is a legal deposit library with the responsibility to preserve and provide access to the collections. For other groupings within the organisation, the university library mainly should be a resource for the core activities of the university—that is, research and education. In other words, within the organisation two cultures coexist, one with a focus on the collections, another with a focus on the users.

In these discussions it has also become obvious that within our organisation, the user perspective is not always the dominant perspective, and thus not everybody agrees that we should apply user experience to our library.

We have begun a process to work with the library's missions, involving a large part of the library staff. As a parallel process, the library service unit has continued to develop the proposal, and how to implement it during the next three to four years. The implementation will start in 2017, with two main projects. The library service unit will develop a programme of visual communication, in order to improve the information and sign system throughout the library. Secondly, we will further investigate and plan the relocation of the collections.

Åsa Forsberg is a librarian and is head of the library services unit at the university library in Lund. asa.forsberg@ub.lu.se

Ingela Wahlgren holds an MLIS and works at the university library in Lund in the library services unit. ingela.wahlgren@ub.lu.se

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Space: Describing and Assessing Library and Other Learning Spaces

Robert Fox
University of Louisville, USA

Martha Kyrillidou
QualityMetrics, LLC, USA

Joan Lippincott
Coalition for Networked Information, USA

Steve Hiller
University of Washington, USA

Abstract

Colleges and universities are investing in revamping their spaces to meet student and faculty needs. As collaborative, shared, and digital library collection development matures, the print record that occupies library shelves representing the intellectual works of our students and faculty is utilized less frequently compared to the digital record—a comparative analogy may be between sailing ships versus steam boats, railroads and ships versus airplanes, and the telegraph versus our cell phones. The miles and miles of open physical shelving housing print books and journals that have occupied prime real estate on campuses to facilitate access to the print record are rethought, reimagined, and redesigned. Shared and/or remote physical storage houses our less frequently used print record. The prime real estate of library space is conceptualized as an environment where our students and faculty physically occupy in greater numbers with greater frequency and intensity in order to achieve increased inspiration, enhanced productivity, and improved learning and research outcomes. The need to capture the transformation and evolution of library spaces is an important driver in this day and age. Classroom and other spaces are also transforming in the academy to be a more effective conduit for student learning, graduate studies, and faculty research. In this paper we discuss a variety of approaches that organizations are undertaking ranging from the ARL Facilities Inventory to the FLEXSpace effort at SUNY to the Learning Space Rating System at ELI/Educause. The authors present results from the ARL Facilities Inventory and lessons learned to date.

Short Description

Find out what data are useful to university and library leaders and directors for benchmarking, longitudinal analysis of spaces, and what kinds of innovative renovations and construction projects are being reported. How can we capture the value of library spaces and their contributions to student and faculty outcomes, and how can library space assessment be woven into campus wide projects?

Outcomes

Recognize the linkages between library space assessment and university level student and faculty outcomes through campus wide assessment efforts in order to establish the library as a strong collaborative partner.

Introduction

Colleges and universities are investing in their existing spaces to meet student and faculty needs. As collaborative, shared, and digital library collection development matures, the print record that occupies library shelves is utilized less frequently compared to the digital. The miles of open physical shelving housing print books and journals that have occupied prime real estate on campuses are rethought, reimagined, and redesigned.[1] As digital collections

grow in volume and usage, shared and other high density physical storage is increasingly available to house our less frequently used print record. Spaces occupied by library collections can be reimagined as an environment where our users are inspired, productive, and enjoy improved learning and research outcomes. Classroom and other spaces are also transforming to be more effective conduits for student learning and faculty research. Faculty and students are increasingly differentiating the ways they perceive library spaces.[2]

The need to capture the transformation and evolution of library and other learning spaces is important. In doing so, we face these questions:

- How can institutions learn from each other? What types of comparisons and benchmarking can we derive?
- How can we use and analyze visual evidence effectively? What are some useful analytical approaches?
- How can facilities data help us tell our story and inform future renovation/construction?

In this paper, we provide results and an analysis of quantitative data shared by member institutions of the Association of Research Libraries (ARL) in the ARL Facilities Inventory. Additionally, we share information on the types of images submitted in conjunction with the Facilities Inventory. We will also discuss learning spaces planning resources such as FLEXSpace and the Learning Space Rating System developed by CNI and its partners and member institutions.

ARL Facilities Inventory

Based on strong interest from member institutions in capturing how library spaces were being developed and repurposed, ARL created a facilities inventory that was administered late 2014 and early 2015 with responses continuing throughout 2015.

The ARL Assessment Committee developed and tested a survey that covered three pages—at first there was push back on having too many data elements, so the survey was reduced to six key questions, a request for three images, and additional contextual data (such as URLs, designs, and flowcharts). Questions included: number of seats, net assignable square footage for study areas, classrooms, and collections; gate counts, the trend for the number of physical locations (up, down, same), funds spent on facilities, and a projection on future facilities funding (up, down, same). Respondents were requested to submit images that reflected how spaces were being used with no pictures of building exteriors or symbolic gothic structures. Compilation and analysis of the quantitative data took place in 2015 and 2016. Additionally, a review and analysis of the images that were submitted took place in 2016.

Findings from Facilities Inventory

A total of 95 ARL members responded to the facilities inventory. The mean number of seats reported was 3,674, with the highest figure reported by the University of Toronto at just over 13,000 seats.

The average and median gate counts figures, for the 88 libraries reporting data, are respectively 2,021,269 and 1,856,005—a better picture is provided by the gate count quartiles:

Quartiles of gate count data (n = 88 research libraries)

Percentiles	25	1328183.25
	50	1856005.50
	75	2532238.50

The third question in the inventory requested respondents to provide the net assignable square footage of their spaces and break that total figure down into the following categories: collections, seating, classrooms, and other. The mean assignable space was 407,415 square feet. In spite of many recent efforts to shift library spaces from collections to users, the highest reported usage of space is still for collections. Libraries reported a mean of 183,558 square feet, or just over 45% of total space, dedicated to collections. Seating represented just under 30% of total space and classrooms occupied a relatively small 4% of space.

The fourth question requested information on the total number of physical library locations. Despite anecdotal evidence of branch library closures, nearly 68% of respondents indicated that the number of library locations was holding steady while almost 18% indicated a growing number of physical locations.

The next question asked for the total facilities expenditures by the libraries over the previous three years. The mean here was just under $8,000,000 with several large projects leading the way. The University of Chicago reported the highest expenditure of $94,550,000, while North Carolina State University was second at just over $85,000,000. Both of these universities opened new libraries during this time. Other universities high on the list—such as Duke University—were in the process of performing substantial renovations to existing spaces.

The final question asked respondents how they expected their facilities expenditures to trend going forward. Over half (56%) expected that their expenditures for facilities would stay the same and nearly a quarter expected their expenditures to increase. This seems to portend a continuing emphasis on repurposing or building new library facilities.

Good footnotes were provided by many libraries. These provided additional contextual data such URLs, designs, and flowcharts.

Libraries were asked to upload up to three images representing spaces in their facilities. These images were placed in an ARL data repository as shown by the example in Figure 1. Instead of providing images, some libraries supplied web addresses that linked to their own image banks (Figure 2). At first, we were unsure how to analyze and describe the images. However, our group spent time this year reviewing those images and tagging them to get an idea of what spaces were being featured and how they were being used.

Figure 1. The ARL web interface featuring images from research library spaces

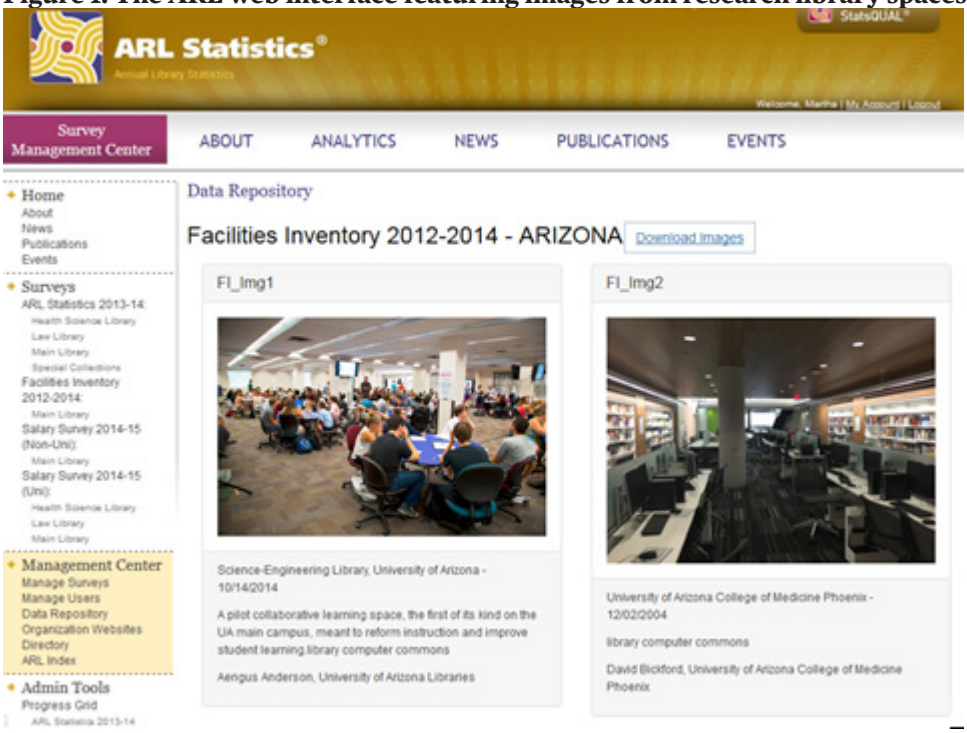
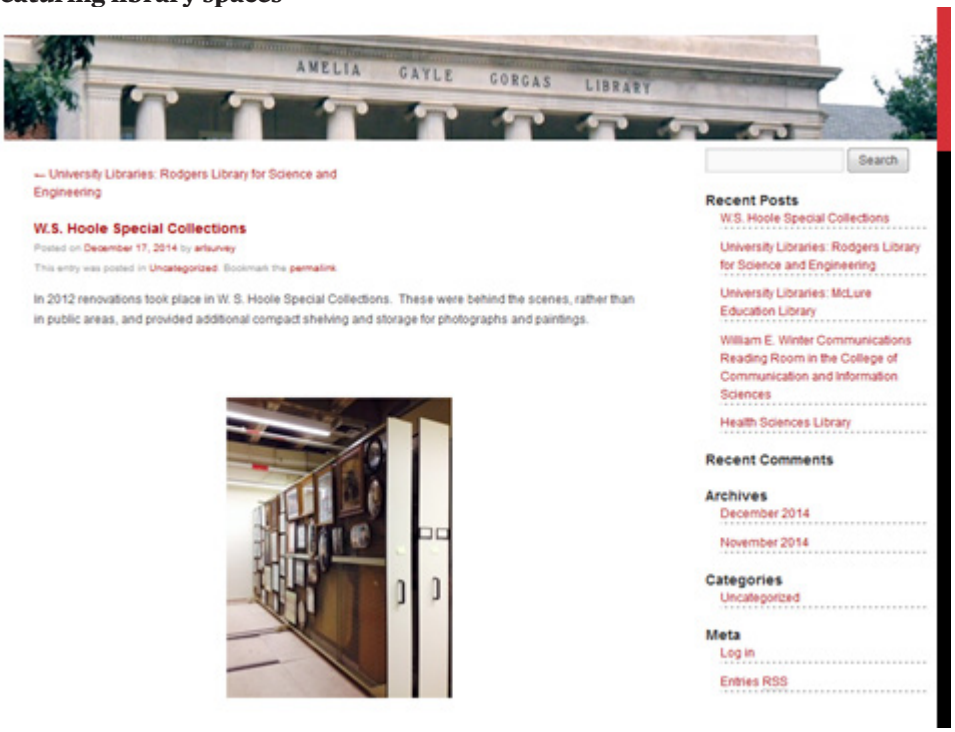


Figure 2. An example of links provided by some research libraries to web pages hosted locally featuring library spaces



We analyzed 134 images and assigned terms to them from an initial list developed by one of the team members and refined by others. We used a total of 46 standard terms to describe these spaces and assigned 246 terms in total—some images were assigned more terms than others if the content needed more explanation. So the quality of the image guided the number of themes we identified in each image, with some being richer in concepts than others. The most popular space featured in these images is the 'group study' environment, where a total of 32 images were identified as such out of the 134. Other popular terms are listed in the table below:

Computer lab	6
Active Learning Classroom	7
Collections	7
Exterior	7
Media Collections	8
Media Viewing	8
Small Meeting/Practice/Group Study Room	8
Classroom – Flexible Tables	9
Open Area – Traditional Tables Seating	10
Large Display Screens	12
Learning Commons	14
Silent/Individual Study/Visually Impaired	16
Open Area – Mixed Seating	21
Group Study	***32***

Other terms used only once include:

Corridors and Spaces Created within Corridors
Simulation Space
Visualization Space
Brainstorming
Classroom – Fixed Tables
Classroom
Connective Space
Exhibit Space
Lecture Hall/Auditorium
Presentation Practice
Prototyping Lab
Prototyping Space
Research Commons
Scanners

If this effort is to be repeated again, we would recommend that the images be collected having a specific purpose in mind, such as renovations or construction or technology equipment, for example. We would also recommend that since there is a baseline collection in ARL's hands now, the focus may need to be on recently renovated spaces in the future. And finally, serious consideration should be given to integrating the ARL data collection in some of the other efforts taking place in higher education and described in the last section of this paper.

Learning Spaces Planning Resources

This section discusses a number of resources you might want to consult as you look to plan learning spaces. To locate additional resources of specific information about a variety of spaces at universities, try FLEXspace, created through a collaboration of some university systems—SUNY and CalState along with partners such as the EDUCAUSE Learning Initiative (ELI) and Herman Miller. Institutions contribute photos and extensive information about spaces they have built or renovated. Many are classroom spaces but some library spaces have been contributed, and they strongly encourage libraries to contribute more examples. You need an account to access the information, but it is free to establish an account. FLEXspace was developed using the Shared Shelf software provided by ARTstor.

The NCSU libraries along with brightspot strategy created the Learning Space Toolkit. Two sections are of particular interest. There is a section focusing on assessment, particularly strong on needs assessment, and there is also a Space Browser in the Space Types section that includes photos and useful descriptions of a variety of renovated or new library spaces.

The Learning Space Rating System developed under the auspices of the ELI provides a set of measurable criteria to assess how well the design of classrooms support and enable active learning activities. There are extensive criteria, many of which could be applied to at least some types of library spaces beyond classrooms. This resource can be freely downloaded and used to both highlight the deficiencies of existing spaces and to evaluate whether newly renovated spaces meet the criteria developed in this system. It can also be used as a planning device in terms of matching the criteria included with your own specifications for spaces.

"A Guide to Planning for Assessing 21st Century Spaces for 21st Century Learners" was produced by the Learning Spaces Collaboratory. This guide focuses primarily on applying learning and pedagogical principles to the design and assessment of learning spaces and also includes profiles and photos from a number of institutional projects.

Conclusion

The qualitative and quantitative data collected through the ARL Facilities Inventory can be of help as you look to benchmark your facilities against peer

institutions. While we are just starting to analyze the rich resource of the image database in the facilities inventory, it can still be useful in helping to showcase exemplary facilities and inspire others to develop similar spaces.

In addition to the ARL Facilities Inventory, there are a number of resources that are available for you to consult as you plan new learning spaces. These resources can help define your space needs, provide examples of similar spaces, and showcase best practices for creating active learning spaces.

Information from the facilities inventory and the planning resources can be used to help make the case for facilities funding. It is important to recognize and utilize the linkages between library space assessment and university level student and faculty outcomes. Ideally, your work in the library can help to establish the library as a strong collaborative partner in campus wide assessment efforts.

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Measurement and Metrics for US Presidential Libraries

Wanda Dole
Abraham Lincoln Presidential Library and Museum, USA

Jack Robertson
Jefferson Library at Monticello, USA

Abstract
Although there are established measurements and metrics for academic libraries, there are few, if any, for presidential libraries, especially hybrid presidential libraries. The presidential library system, which is part of the National Archives and Records Administration (NARA), administers 13 libraries documenting the lives and work of US presidents since Herbert Hoover (1929–1933). Libraries and museums documenting the lives of earlier presidents are housed and administered in a variety of ways—by foundations, universities, state historical libraries, and state governments. This presentation examines and compares the characteristics and current practices of NARA and pre-NARA presidential libraries and attempts to identify guidelines and metrics for measuring them. It examines in depth the unique characteristics and challenges of two pre-NARA presidential libraries: the Abraham Lincoln Presidential Library and Museum in Springfield, IL, and the Thomas Jefferson Foundation, which owns and operates Monticello in Charlottesville, VA.

Introduction
Although there are established measurements and metrics for academic libraries, there are few, if any, for presidential libraries, especially hybrid presidential sites, which combine libraries and archives with home sites, museums, and education centers. The federal presidential library system, which is part of the National Archives and Records Administration (NARA), administers 13 sites. These preserve archives and artifacts documenting the lives and work of US presidents since Herbert Hoover (1929–1933). Libraries and museums documenting earlier presidents are administered in a variety of ways—by foundations, universities, state historical libraries, and state governments.

NARA Presidential Libraries
There are currently 13 NARA presidential libraries documenting the lives of presidents from Herbert Hoover to George W. Bush. The inspiration for the system came from the Rutherford B. Hayes Presidential Center, which opened to the public on May 30, 1916. The Hayes Center inspired Franklin Delano Roosevelt to establish a library to house his papers on the Roosevelt estate in Hyde Park, NY, in 1939.

In 1950, Harry S. Truman decided that he, too, would build a library to house his presidential papers and helped to spur congressional action. The Presidential Libraries Act of 1955 (http://www.archives.gov/presidential-libraries/laws/1955-act.html) established a system of privately built and federally maintained libraries. In each case, funds from private and non-federal public sources provided the funds to build the library. Once completed, the private organization turned over the libraries to NARA to operate and maintain.

The Presidential Records Act of 1978 (http://www.archives.gov/presidential-libraries/laws/1978-act.html) established that the presidential records that document the constitutional, statutory, and ceremonial duties of the president are the property of the United States government. After a president leaves office, the archivist of the United States assumes custody of the records. The act allowed for the continuation of presidential libraries as the repository for presidential records. There are currently 13 NARA presidential libraries that follow national standards for preservation and access to public records established by statute and administered by NARA. NARA establishes the metrics used by these libraries.

Pre-NARA Libraries

In addition to the 13 NARA presidential libraries, there are commemorative sites for 29 presidents, some of which support research libraries for scholars and some with information centers for staff use only. These sites, addressing 69% of American presidential history,[1] range widely in governance, funding, staffing, programming, public engagement, and support of scholarly endeavors. There is no network or association within which these libraries share common values or data-driven planning, and even a listing of agencies associated with the American presidency is hard to come by. The Jefferson Library at Monticello and the Abraham Lincoln Presidential Library and Museum are pre-NARA presidential libraries, and they will be described and assessed in some detail. In addition, findings of a survey of key sites representing all presidents prior to Herbert Hoover will be presented.

The Jefferson Library at Monticello and the Abraham Lincoln Presidential Library and Museum

The Jefferson Library (JL) opened on April 13, 2002, and adopted as its mission: "to provide access to information on Thomas Jefferson's life, times, and legacy." JL is the information services and resources provider and the institutional archives repository for the Thomas Jefferson Foundation (TJF), which has owned and operated Thomas Jefferson's home, Monticello, since 1923. TJF is incorporated as a 501c3 and has over 300 staff members, of whom 200 have academic knowledge-based jobs. JL is a component of the International Center for Jefferson Studies (ICJS) founded in 1994, which provides residential fellowships for 30 research fellows and hosts another two dozen visiting scholars per year. In the past 20 years these fellows and scholars have produced over 400 publications based on work at Monticello. JL supports other key components of TJF: *The Papers of Thomas Jefferson: Retirement Series* (Princeton University Press), Archaeology and the Digital Archaeological Archive of Comparative Slavery, Thomas Jefferson Center for Historic Plants, the Curatorial and Restoration Department, and the Education and Visitor Programs Department. Many students, researchers, and scholars from the University of Virginia, which was founded by Jefferson in 1816–1819 across town from Monticello, conduct work at the JL.

JL commenced with 5,000 uncatalogued books, 50+ years accumulation of gray literature and images, and 80 years of TJF unprocessed archives. Since 2002 it has grown to 25,000 books and 10,000 research reports and vertical files. The integrated library system provides analyzed and abstracted records for all material. Two-thirds of the institutional archives, which originally consisted of 1,500 linear feet of "stuff," have been processed into 75 record groups and finding aids entered into the Archon archives management system for public access. Particular emphasis on acquisition of digital historical resources has resulted in provision of nearly 100 databases containing over 100 million full-text titles. JL has become the Library of Record for Thomas Jefferson research and scholarship.

The Abraham Lincoln Presidential Library and Museum traces its roots to 1889 when the Illinois General Assembly established the Illinois State Historical Library as a repository for materials on the state's political, social, and religious history. A large collection of Lincoln materials collected by Illinois governor Henry Horner and willed to the library upon his death in 1940 formed the foundation of the library's Lincoln Collection. Later additions included the 1942 acquisition of an original copy of the Gettysburg Address in Lincoln's hand purchased in part with pennies donated by schoolchildren, an extensive collection of other manuscripts written or signed by Lincoln, as well as books, photographs, and artifacts relating to his life, times, and legacy.

Although known for its namesake, the library contains an outstanding collection of materials on Illinois' history, including eight miles of below-ground stacks that house books, original maps, and thousands of boxes of personal papers and other records relating to Illinois' political, business, and cultural leaders. The print collection includes over 200,000 volumes. The manuscripts department contains roughly 6,000 manuscript collections with over 12 million items; approximately 1,100 of the collections have a Civil War component. The AV department contains over 500,000 photographs and negatives, as well as over 20,000 films, videotapes, audiotapes, posters, broadsides, and works of art. The Lincoln Collection contains roughly 52,000 items, including manuscripts, published items, relics, artworks, newspapers, broadsides, prints, maps, and music. The library is responsible for microfilming approximately 270 local newspapers from 102 Illinois counties. The newspaper collection has 100,000 reels of microfilm. The library hosts approximately 48,000 visitors annually.

The Survey

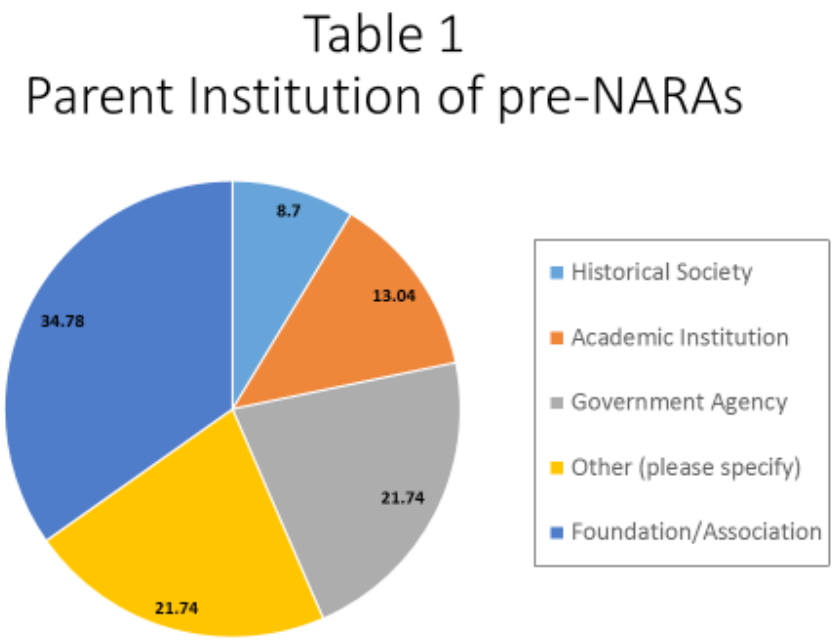
The authors sought to identify the characteristics of pre-NARA libraries and to learn if the data collected by the libraries were similar to those found in previous surveys. They also wanted to identify how the libraries used the data and what data were considered useful for measuring performance and doing planning. They used both qualitative and quantitative methods to gather this information.

Robertson phoned, e-mailed, and visited a number of pre-NARA presidential libraries. His calls and visits identified a survey population of 29 sites (Appendix 1). A distinction was drawn between sites that supported scholarly research libraries and archives versus those with information collections for staff use only. Depending on the specific circumstances at each agency, the following elements were included in conversations conducted during site visits:

1. Nature/scope of collections: formats/date ranges/scholarly, popular, fiction, young readers; journals by titles and/or individual articles/ephemera/newspapers/microforms/pictorial and audio-visual resources; full-text digital historical resources
2. Nature/scope of library staffing: librarians/archivists/preservationists/tech support/volunteers and interns
3. Nature of library clientele: institution staff, local students/teachers, area college students/faculty, visiting scholars; is there support/fellowships for scholars/academic researchers?
4. Nature/scope of physical facilities: age/size/public, staff, storage
5. Archives: original manuscripts/facsimiles/family and friends/digital finding aids and/or digital content initiatives
6. Electronic outreach: online catalog/website (and stats)/online pubs/born-digital scholarship/digital dissemination initiatives
7. Funding sources: through governing agency operating budgets/endowments/fund raising/grants
8. Connections/collaborations/networking: with local/regional/national education/culture/government/descendants group
9. One to five year documents: policies and procedures, plans, visioning, assessments, annual reports

After reviewing the literature, the authors drafted a 10-question instrument (Appendix 2) based on Veit's survey of presidential libraries.[2] They revised the questions for electronic distribution via SurveyMonkey, and added questions about types of data collected and used for planning purposes. Thirty-eight sites were identified and the survey was sent to contacts at 29 agencies from July 1 to 8, 2016. Twenty-three (79.3%) sites responded. The responding sites reported to and were governed by foundations or associations, government agencies, historical societies, and other types of institutions (see Table 1).

Table 1: Parent Institution of pre-NARAs



The data most commonly collected (see Table 2) and considered useful for planning (see Table 3) include information on:

- Collection
- Expenditures
- Personnel
- Instruction
- Reference
- Use of electronic resources
- Interlibrary loans
- Gate count
- Exhibits
- Visits to web site

Table 2: Pre-NARAs Collect These Data

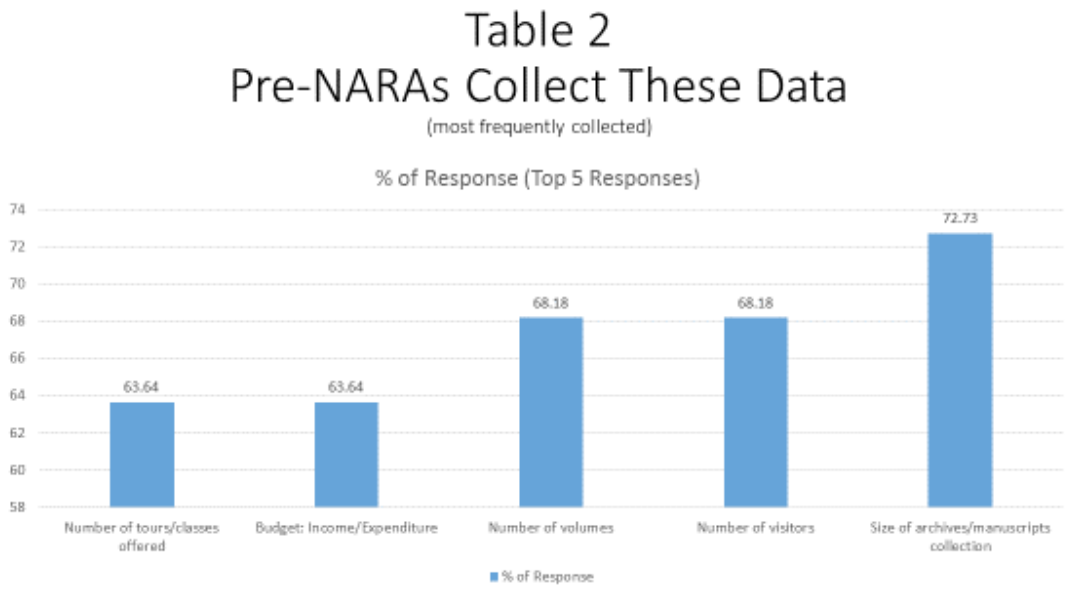
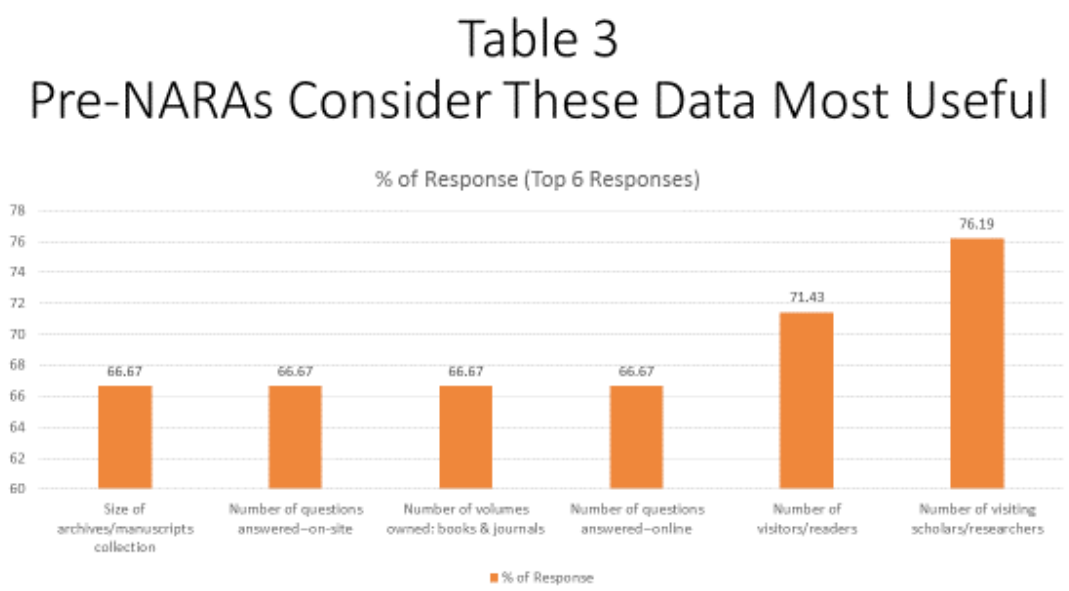
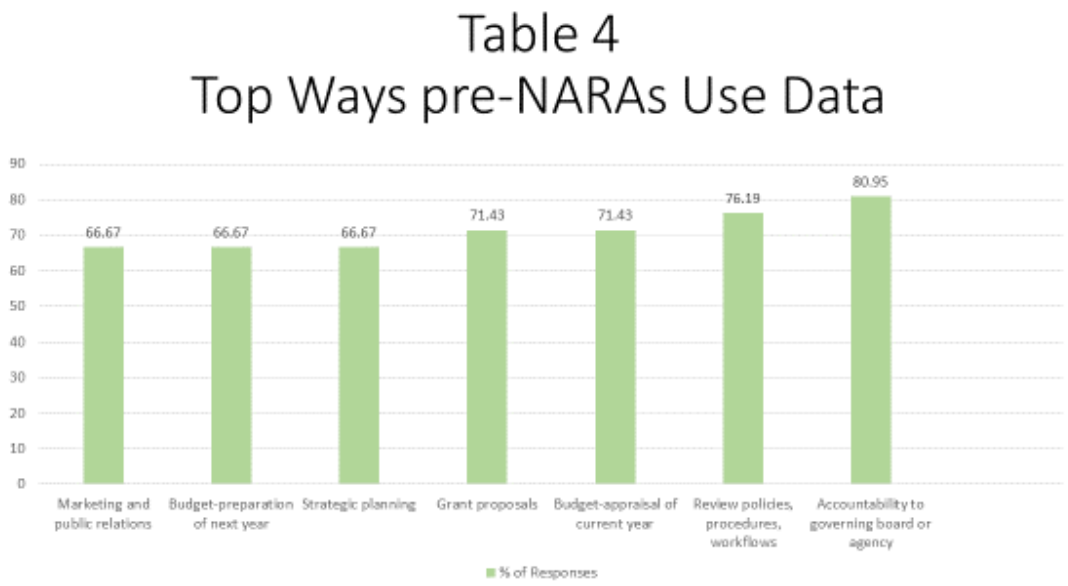


Table 3: Pre-NARAs Consider These Data Most Useful



The libraries use these data for reporting back to governing boards, reviewing policies and procedures, budgeting, planning, and marketing (see Table 4).

Table 4: Top Ways pre-NARAs Use Data



Data most commonly required by the parent institution include:

- Number of visitors
- Number of research transactions
- Expenditures
  - Staff
  - Collections
  - Other resources
- Staff size
- Collection
  - Size
  - Additions
  - Use by researchers

Respondents identified the following data "not currently collected and not listed in the survey" as potentially useful for planning and decision making:

- Core benchmarks for pre-NARAs
- Number of visitors/tours
- Total annual budget
- Total collection size
- Total staff
  - Number of volunteers
- Size of collection storage (square feet)
- Publicity/outreach; media coverage of library
- Partner libraries and archives
- Use of library web site
  - Use of online catalog

Conclusions

This paper describes attempts to identify libraries that support inquiry into the lives and legacy of presidents prior to the establishment of NARA presidential libraries. Identification was complicated by the fact that these sites include historic homes and museums, as well as public or not-for-profit libraries and archives, universities, and government agencies. Some of the sites do not support libraries, properly speaking, lacking staff, policies and procedures, and technical infrastructures; most of these sites do supply accumulated materials to support staff activities. The authors attempted to gather comparable information on types of data gathered to document resources and services and use in strategic planning and management. Because of the wide diversity in size and type of institution in which these libraries operate, the authors did not concern themselves with descriptive data such as volume count or dollar expenditures, but rather with *types* of data collected. The results provide a baseline upon which pre-NARA libraries may begin to analyze local resources and activities, and to evaluate potential areas of growth and change. Finally, a previously-non-existent network may be created to link these agencies commemorating the accomplishments and legacy of 18th, 19th, and early 20th century presidents for future communication and collaboration.

Notes

1. Kimberly Kenney, "Presidential Libraries Outside of the National Archives System," *White House History* 40 (Winter 2016): 17.
2. Fritz Veit, *Presidential Libraries and Collections* (Westport, Ct.: 1987), 135–37.

Appendix 1

President	Institution	Research Library	Contacts: Phone/ E-mail/Visit	Survey: Sent/ Responded
George Washington 1. 1789–1797	George Washington's Mount Vernon Founded 1853 Fred W. Smith National Library for the Study of George Washington (Library opened 2013)	Y	N/Y/Y	Y/Y
John Adams 2. 1797–1801 AND John Quincy Adams 6. 1825–1829	NPS Adams National Historical Park and Homesite: "Peacefield"	N	Y/Y/N	Y/Y
Thomas Jefferson 3. 1801–1809	Thomas Jefferson Foundation Founded 1923 Jefferson Library at Monticello (Library opened 2002)	Y	Y/Y/Y	Y/Y
James Madison 4. 1809–1817	James Madison's Montpelier Orange, VA	Y	Y/Y/Y	Y/Y
James Monroe 5. 1817–1825	James Monroe's Highland Homesite, Charlottesville, VA AND James Monroe Museum & Memorial Library Fredericksburg, VA	N Y	Y/Y/Y Y/Y/N	Y/Y Y/Y
Andrew Jackson 7. 1829–1837	Hermitage Nashville, TN	N	Y/Y/Y	Y/Y
Martin Van Buren 8. 1837–1841	NPS Martin Van Buren National Historic Site Homesite: "Lindenwald" Kinderhook, NY	N	N/Y/N	Y/Y
William Henry Harrison 9. 1841	William Henry Harrison Home Grouseland, and Grouseland Foundation Vincennes, IN	N	Y/Y/Y	Y/Y
John Tyler 10. 1841–1845	Sherwood Forest, Home of J.T. Charles City, VA Sherwood Forest Plantation Foundation	N	Y/Y/N	Y/Y
James K. Polk 11. 1845–1849	James K. Polk Home & Museum Columbia, TN	N	Y/Y/N	Y/Y

President	Institution	Research Library	Contacts: Phone/ E-mail/Visit	Survey: Sent/ Responded
Zachary Taylor 12. 1849–1850	Zachary Taylor Home (NPS) Louisville, KY private home, not open to the public	N	N/N/N	N/N
Millard Fillmore 13. 1850–1853	Aurora Historical Society Millard Fillmore Presidential site	N	Y/Y/N	Y/Y
Franklin Pierce 14. 1853–1857	NPS Franklin Pierce Homestead The Manse, Concord, NH	N	Y/Y/N	Y/N
James Buchanan 15. 1857–1861	NPS James Buchanan Home “Wheatland” Lancaster, PA Administered by Lancaster Historical Society Buchanan Collections	Y	Y/Y/N	Y/Y
Abraham Lincoln 16. 1861–1865	Abraham Lincoln Presidential Library & Museum Springfield, IL	Y	Y/Y/Y	Y/Y
Andrew Johnson 17. 1865–1869	Andrew Johnson National Historic Site (NPS) Tusculum College, Greeneville, TN	N	Y/Y/N	Y/N
Ulysses S. Grant 18. 1869–1877	NPS Ulysses S. Grant National Historic Site Homesite: “Whitehaven,” St. Louis, MO AND Ulysses S. Grant Presidential Library US Grant Assoc. at Mississippi State University	N Y	N/N/N Y/Y/N	N/N Y/Y
Rutherford B. Hayes 19. 1877–1881	Rutherford B. Hayes Presidential Center, aka Hayes Presidential Library and Museum, Spiegel Grove Homesite, Fremont, OH	Y	Y/Y/Y	Y/Y

President	Institution	Research Library	Contacts: Phone/ E-mail/Visit	Survey: Sent/ Responded
James A. Garfield 20. 1881–1885	James A. Garfield Presidential Site (NPS) Mentor, OH AND Western Reserve Historical Society Garfield collections	N Y	Y/Y/N Y/Y/N	Y/Y Y/N
Chester A. Arthur 21. 1885–1889	NPS Chester A. Arthur House New York City, NY privately owned AND Arthur Historic Site, Vermont Fairfield, VT	N N	N/N/N Y/Y/N	N/N N/N
Grover Cleveland 22. 1885–1889 AND 24. 1893–1897	Grover Cleveland Home (NPS) Westland, NJ privately owned Grover Cleveland Birthplace Princeton, NJ AND Grover Cleveland Birthplace Memorial Assoc. Caldwell, NJ	N N	N/N/N N/N/N	N/N N/N
Benjamin Harrison 23. 1889–1893	Benjamin Harrison Presidential Site Indianapolis, IN	N	Y/Y/Y	Y/Y
William McKinley 25. 1897–1901	William McKinley Presidential Library & Museum Canton, OH	Y	Y/Y/Y	Y/N
Theodore Roosevelt 26. 1901–1909	Theodore Roosevelt Center/ Presidential Library Dickinson State University Dickinson, ND	Y	Y/Y/Y	Y/Y
William Taft 27. 1909–1913	William Howard Taft Home & Education Center (NPS) Cincinnati, OH	Y	Y/Y/N	Y/Y
Woodrow Wilson 28. 1913–1921	Woodrow Wilson Presidential Library Staunton, VA	Y	Y/Y/N	Y/Y

President	Institution	Research Library	Contacts: Phone/ E-mail/Visit	Survey: Sent/ Responded
Warren G. Harding 29. 1921–August 1923	Warren G. Harding Home and Memorial (NPS) [new Visitor Center underway that will contain presidential papers, 1,700+ volumes, photographs] CURRENTLY at: Ohio Discovery Center, Columbus, OH	N Y	Y/Y/N N/Y/N	Y/N N/N
Calvin Coolidge 30. 1923–1929	NPS Coolidge Homestead Plymouth, VT AND Calvin Coolidge Presidential Library and Museum at the Forbes Public Library, Northampton, MA	N Y	N/N/N Y/Y/N	N/N Y/Y

OTHER:

President	Institution	Research Library	Contacts: Phone/E-mail/Visit	Survey: Sent/ Responded
Jefferson Davis 1861–1865	Beauvoir Jefferson Davis Presidential Home and Library Biloxi, MS	Y	Y/Y/N	Y/N
First Ladies	National First Ladies Library Canton, OH	Y	Y/Y/N	Y/Y
White House	White House Historical Association Washington, DC	Y	Y/Y/N	N/N

SUMMARY

38 Sites / Agencies

18 WITH research library supporting **scholarship**

20 with information collections supporting **staff activities**

29 contacted by **phone**

32 contacted by **e-mail**

11 visited in person

29 surveys sent

23 surveys received

Appendix 2

Pre-NARA Presidential Libraries & Archives Survey

Dear Colleagues,

We are seeking your in-put on the information resources held at your presidential site. "Information resources" means anything ranging from a formally organized and staffed library and/or archives to informal collections of published and unpublished materials. Uses of these resources may range from support of staff activities such as interpretive programs and website content to production of publications and hosting scholars and teachers conducting research.

The primary focus of our study is the types of data collected at your institution and how this data is used.

We hope that this initial survey will lead to a collaborative network of pre-NARA Presidential sites. Such a group may engender sharing of expertise, experience, and knowledge tools.

1. Name of Institution
2. Founding date
3. Please indicate the type of organization governing your institution
    a. Foundation/Association
    b. Historical Society
    c. Academic Institution
    d. Government Agency
    e. Other (please specify)
4. If your institution is part of a consortium or network please enter name(s):
5. Full Time Equivalent staff working in the library, archive, or information collections (please include professional, technical and support, interns and volunteers in this total)
6. What data relevant to library/archives/information center operations are now gathered?
    a. Number of visitors/readers
    b. Number of school groups
    c. Number of tours/classes offered
    d. Number of visiting scholars/researchers

e. Number of volumes owned: books and journals

f. Number of volumes added

g. Number of volumes used/circulated

h. Number of non-books items owned: graphics, micro forms, ephemera, etc.

i. Number of non-books items added

j. Size of archives/manuscripts collection

k. Number of archives/manuscripts collections processed

l. Number of archives/manuscripts items/folders used

m. Size of digital resource collections: derived from institution's collections

n. Size of digital resource collections from external sources/vendors

o. Number of online searches and/or full-text downloads

p. Number of questions answered—on-site

q. Number of questions answered—online

r. Number of items borrowed from or loaned to other institutions

s. Number of titles published based on your institution's information resources

t. Number of online or physical exhibitions supported with your institution's resources

u. Web traffic to library/archives resources

v. Surveys/users' feedback on library/archives resources and services

w. Budget revenue/expenditure reports

Other (please specify)

7. What data relevant to library/archives/information center operations, do you consider useful for planning, decision making and priority-setting at your institution? (Same choices a–w as question 6)

8. Please indicate how the collected data are applied or used:

a. Accountability to governing board or agency

b. Annual report

c. Appraisal of physical infrastructure

d. Appraisal of technology systems

e. Benchmarking with other institutions

f. Budget—appraisal of current year

g. Budget—preparation of next year

h. Decision to cancel subscriptions

i. Decision to suspend fee-based online access

j. Fund raising

k. Grant proposals

l. Marketing and public relations

m. Review of policies, procedures, workflows

n. Scope—geographic and volume—of Internet outreach

o. Staff evaluation—of current personnel

p. Staff evaluation—recruitment of new personnel

q. Strategic planning

r. Year-by-year progress measurement

9. What data are required by the governing organization to which your library/archives reports? Please describe/list:

   Are there other data—not currently collected and not listed in this survey—that you think would be useful for planning and decision making? Please describe/list:

Graduate in Four Years? Yes, the Library Can Help with That!

Jan Fransen and Kate Peterson
University of Minnesota, Twin Cities, USA

Abstract

Since fall 2011, our library has been collecting usage data for several types of library interactions: loans, digital use, public workstation use, online reference interactions, and instruction. We have found positive correlations between first-year students' use of the library and a variety of success measures, from GPA to academic engagement.

By the spring of 2015, many members of that first cohort had graduated. We matched the data from their first year with information on whether they had graduated, were still active students, or had withdrawn. We hoped to determine whether there was a correlation between library use in the first year and graduation within four years, as well as whether there was a correlation between library use in the first year and retention at the four-year mark (as opposed to withdrawal).

At the same time, we chose to apply a different statistical technique, propensity score matching, in this analysis. Our previous work used regression analysis to account for factors that might also affect student outcomes. Such analysis is more robust than simply comparing one group's GPA to another's, but propensity score matching allows us to construct "control" and "treatment" groups after the fact that are very similar to each other, further reducing the bias inherent in any work where members of the group self-select their membership.

Using propensity score matching and the 2011 cohort, our results suggest that using the library at least one time in the first year of enrollment significantly increased the odds that a student would graduate in four years or remain enrolled after four years as opposed to withdrawing from the university. In fact, students who used electronic resources during their first year were almost twice as likely to graduate in four years as those who did not.

Introduction

When our small group at the University of Minnesota Libraries began collaborating with the University Office of Institutional Research, we focused first on success measures relevant for first-year students: grade point average (GPA) and retention to the second semester and second year.[1] These measures are both relatively easy to collect from institutional records and good indicators of a student's likelihood to earn their degree. We were encouraged by the positive correlations we found between the fall 2011 first-year cohort's success measures and their use of different types of library resources and services. Even then, we were speaking of that distant point in the future when we would be able to look for correlations between library use and earning a degree in a timely manner.

In 2015, we realized that our first cohort had reached the "four-year graduation" mark. Those students who started in fall 2011 and stayed "on track" throughout would have graduated in May. Those who had not graduated yet but were still enrolled were likely to achieve their degree in another year or two.

Graduation as a Success Measure

Graduation rate is defined as the percent of first-time, first-year undergraduate students who complete their program within a certain time. Any US institution that awards federal student aid is required to report the graduation rate as "[t]he percentage of a school's first-time, first-year undergraduate students who complete their program within 150% of the standard time for the program."[2] Most University of Minnesota undergraduate degrees are four-year programs, so six-year graduation rate is reported to the US Department of Education.

Four-year graduation rate is commonly used by college ranking systems such as US News & World Report.[3] Prospective students (and their parents) generally budget for four years' worth of tuition and obtain a four-year degree in that time, so they look for institutions that show evidence of helping past students reach that goal.

Supporting Graduation at the University of Minnesota

The University of Minnesota has had a policy regarding "timely graduation" since at least 2009. The policy statement "Promoting Timely Graduation by Undergraduates" specifies responsibilities for both the institution and the student with this stated purpose:

> Timely graduation is an underlying foundational principle for undergraduate education at the University. To make the best use of students' resources, as well as University resources, students must pursue their undergraduate degree(s) in a timely fashion and are not allowed to register for courses indefinitely without having a formal plan for timely completion of a degree. This policy implements criteria and requirements for accreditation established by the Higher Learning Commission.[4]

The Office of Institutional Research (OIR) compiles and publishes graduation and retention data annually,[5] and the university promotes timely graduation to students as a goal through multiple venues, such as Student Services' "How to Graduate in Four Years" webpage.[6]

In 2015, the Minnesota State Legislature added even more weight to this already important measure by making five percent of the university's $1.1 billion in funding for operations and maintenance contingent upon meeting certain goals. Two of the five goals include graduation rate:

- "Increase by at least 1 percent the four-year, five-year, or six-year undergraduate graduation rates, averaged over three years, for students of color system wide at the U of M reported in fall 2016 over fall 2014.[7]
- "Increase by at least 1 percent the four-year undergraduate graduation rate at the University of Minnesota reported in fall 2016 over fall 2014."[8]

Graduating in a timely manner is as much to the student's benefit as the institution's, now more than ever. In bygone days, public higher education was funded primarily with state and local moneys. As government budgets have been cut, public institutions have come to rely primarily on tuition dollars. As tuition increases to meet the funding need, individual student loan debt also increases. Finishing a degree in a timely manner means borrowing less money. Students who take longer to complete degrees also lose wages they could have been earning if they had completed a degree. Obviously, students who are unable to complete a degree are doubly burdened—they have no degree but they do have debt to repay. Thus, it is imperative that the entire campus is geared towards student success and graduating students on time—even the library.

But Is the Library Important?

Clearly, libraries are one piece of a large and complex network of student experiences that contribute (or do not contribute) to success. However, much of the literature around student success, such as Pascarella and Terenzini's *How College Affects Students: Findings and Insights from Twenty Years of Research*, Astin's *What Matters in College: Four Critical Years Revisited* (1993), or Kuh's chapter in *Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College* , either do not mention or barely mention the library.[9]

Often in previous studies such as these, libraries collected use data through surveys and other self-reported measures. Kuh and Gonyea[10] found that "library use did not appear to make independent contributions to desirable outcomes of college." Also, Pike and Kuh[11] used four factors to measure academic engagement: library experience, active and collaborative learning, writing experiences, and interactions with faculty. For both studies, the authors used data from the College Student Experience Questionnaire (CSEQ). The authors point out that student self-reported data is problematic. In past decades, it was difficult, if not impossible, to systematically collect information about student use of the library. That time has passed. Now we are able to directly measure at least some of the ways students use our collections, resources, and services. The data we have been analyzing measures deliberate actions of students. There are still many things we do not know (i.e., did they read that journal article?) but it is a step forward.

With our latest work, we hope to refresh and reexamine the importance of the library in supporting student success and retention. Clearly using the library in a vacuum is not what this is all about; rather, library use is really a potential measure of many practices and skills. Among them:

- curiosity and inquiry
- integrating a wide variety of high quality and diverse sources
- analyzing sources and thinking critically
- studying and working in an academic place on campus focused on productivity and scholarship
- getting expert help
- deeper learning about course topics and related research topics
- organizing information, PDFs and citations

We believe libraries are inherently "educationally purposeful." We suspect that library use may be a meaningful surrogate for academic engagement. As Pascarella and Ternizin wrote, those who partake of "educationally purposeful activities report gaining more from college compared with their peers who engage less frequently in such activities or who focus on only one or two areas."[12] Tinto[13] used library as one measure of academic engagement in comparing different classroom experiences. It may be part of measuring the "symbiotic" relationship between faculty members and the institution to provide high quality and engaging learning opportunities.

University of Minnesota-Twin Cities: Our Context

The University of Minnesota-Twin Cities is a large, urban, R1 institution. It is Minnesota's land grant and is the largest institution in the state. The total university enrollment is over 48,000 students, with about 30,500 undergraduates and 16,300 graduate and professional students as of 2015.[14]

Undergraduates

We have a large campus with over 150 possible majors for undergraduates, from accounting to youth studies. We have eight undergraduate admitting colleges, with the College of Liberal Arts and the College of Science and Engineering having the most students with 13,600 and 5,332 respectively.[15] The majority of our students are full time (92%).[16]

About 20% of students identify as a race or ethnicity other than white, not including international students. As of spring 2016, international students make up about 9% of our undergraduate population. The majority of our students, about 66%, are from the state of Minnesota. For our incoming first year students in fall 2015, about 27% were first generation students and 18% were Pell Grant eligible students. The average ACT score is 28.2 and the average high school rank is 86.5%. The majority of our first-year students live on campus during their first year, with over 88% living in one of 12 residence halls.[17]

Library Data and Student Success: Previous Findings

In the spring of 2011, a small group of library staff decided to conduct a pilot study loosely modeled on a 2009 Minnesota study that found correlations between use of the campus recreation center and first-year retention rate as well as five-year graduation rate.[18] We sought to:

- collect data that included Internet ID from as many library service and resource usage points as possible[19]
- engage with the Office of Institutional Research (OIR) to match student use with student demographics and success measures; and
- work with OIR to conduct a statistical analysis and determine whether any correlations existed between library usage and success measures.

Data gathered by the libraries in summer 2011 and analyzed by OIR yielded results that were promising enough for OIR to agree to participate in a more fulsome study during fall 2011. That study launched a fruitful ongoing collaboration between OIR and the libraries. Among our statistically significant findings for the fall 2011 and fall 2012 first-year, first-time cohorts:

- For the 2011 cohort, using a library service at least once in the first semester correlates to a higher first semester GPA and to retention from first to second semester.[20]
- Similarly, using a library service at least once in the first year correlates to higher first year GPA and to retention first to second year.[21] This study analyzed the same cohort as our first study, but after their first full year, bolstering our confidence in the results of the first study.
- For the 2011 cohort, use of library services and resources correlated with academic engagement and engagement in scholarship as measured by the Student Experience in a Research University (SERU) survey.[22]
- For the 2012 cohort, students with lower socioeconomic status backgrounds were somewhat less likely to use library services and resources in several (but not all) areas.[23] For this study, socioeconomic status background was determined using students' responses to the Cooperative Institutional Research Program (CIRP) Freshman Survey given to the 2012 cohort. While results of the study were

somewhat mixed, they provide a starting point as we determine how to identify and reach out to students who may need more help or encouragement to engage with library resources when they need them.

The methods used in our studies included controlling for students' demographic characteristics (sex, race/ethnicity, international status, Pell Grant recipient, first-generation college students), pre-college academic characteristics (ACT score, AP credits), and collegiate experiences (living on campus, participation in a freshman seminar, college of enrollment).

Improving Our Methods: Propensity Score Matching

When we present our work, we are often asked whether our results show that using library resources and services **causes** students to be more successful. Our answer is, of course, no. We are neither able nor willing to do carefully controlled double-blind studies with our students, dividing them randomly into groups and denying one group library services and resources. Instead, we continue to perform observational studies. Each positive result contributes to the case that libraries can make a difference and helps us identify how and when to engage with our students to maximize our resources and their benefit. As we progress, we seek out ways to improve our methods, whether by identifying more independent variables, improving the depth and accuracy of the library usage data we collect, or improving analysis methods.

The regression analysis techniques used are common to social science research and the correlations identified thus far have helped us refine and target both our services and our data collection practices. One limitation has always been selection bias: students determine on their own whether they will be a library user or not, and it may be that students who are going to be successful anyway just happen to be the kind of students who like to use libraries.

For the graduation rate study, though, we followed the lead of Chiteng Kot and Jones[24] and used a technique called propensity score matching instead of the regression analysis methods of our previous studies. Propensity score matching allows the researcher to construct something like an experimental study and reduce the impact of selection bias.

We describe the method we use in a forthcoming article.[25] For non-statisticians (including the librarians involved in the project), the technique looks like this:

1. Describe each student in the study (5,368 first-year undergraduates in 2011) in terms of the indicators known to relate to students' use of library services and resources. Based on our past work, we identified these factors:
   a. Race/ethnicity
   b. Sex
   c. On-campus residency
   d. First-generation status
   e. Participation in a freshman seminar
   f. College of enrollment
   g. Socioeconomic status as measured by Pell Grant
   h. Incoming ACT/SAT scores

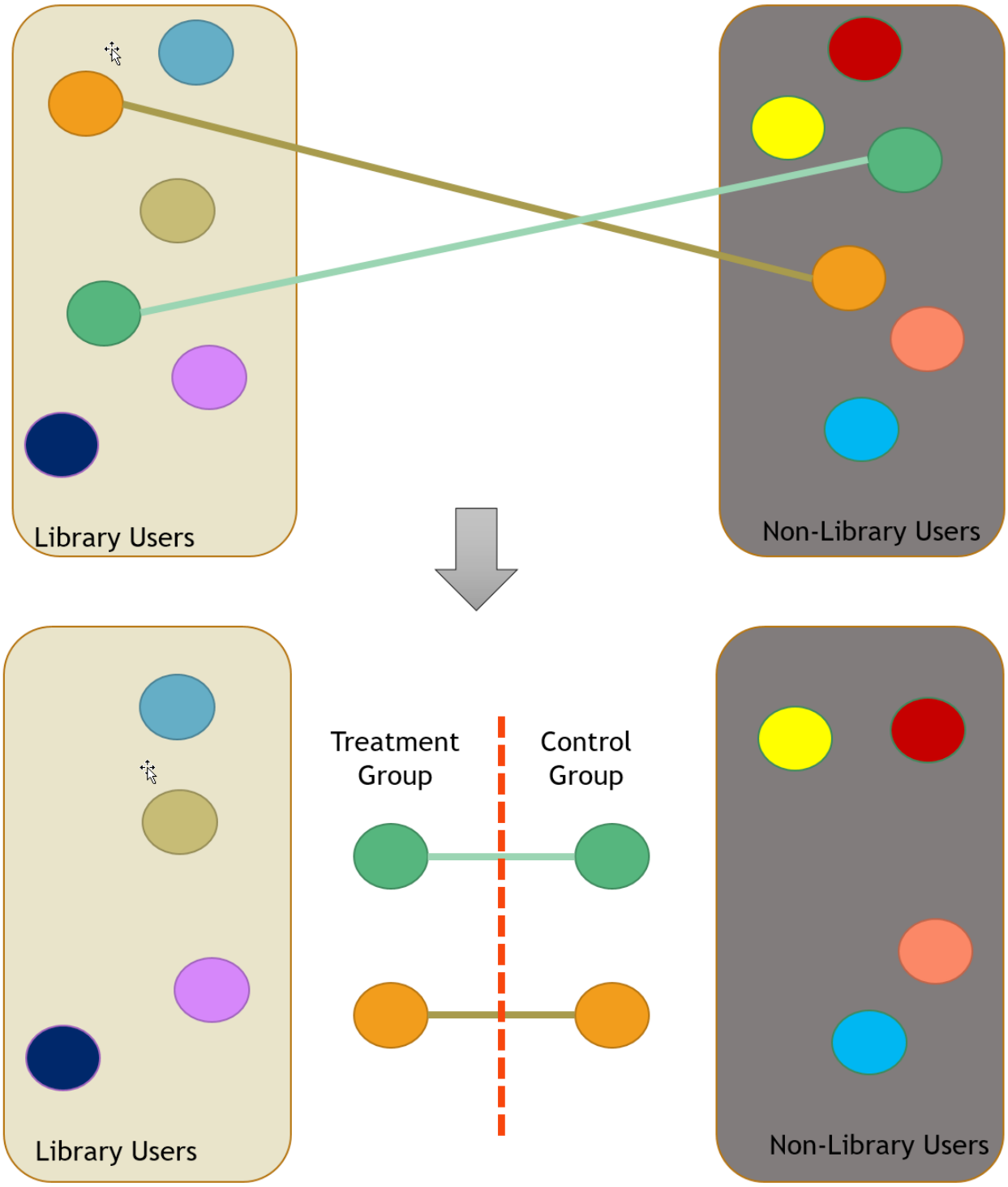
2. For each aspect of library services and resources, calculate the probability that each student will use that aspect based on the indicators identified in (1). That probability is the person's "propensity score." For this study, we grouped the library services and resources measured into five aspects:
   a. Borrowing books (including interlibrary loan and e-books)
   b. Using electronic resources (including academic journals, databases, and use of our website)
   c. Logging into a computer workstation in a library
   d. Course integrated library instruction, workshop, or completing online tutorial
   e. Using reference services (including peer library tutoring and the chat reference service)

3. Working with one aspect at a time, split the group in two:
   a. The "treatment" group is the group of students who *did* make use of the library service or resource
   b. The "control" group is the group of students who *did not* make use of the library service or resource

4. Match each person in the treatment group with the person in the control group with the closest propensity score (Figure 1).
5. Controlling for propensity scores, perform multinomial logistic regression analysis to

determine the odds of graduating in four years and of continued enrollment after four years against withdrawal from the university.

Figure 1. Simplified view of the propensity score matching method



Results

Results of the study suggest that using a library resource or service at least once in the first year of enrollment significantly increased the odds that students would graduate in four years or remain enrolled after four years as opposed to withdrawing from the university. The largest increase in odds occurred with electronic resource use: students who used electronic resources were nearly twice as likely to graduate in four years. Those not using electronic resources were significantly more likely to still be enrolled at the university.

Borrowing books increased odds of graduation in four years, but showed no effect on continued enrollment.

The inverse was true of library instruction: while library instruction did not significantly affect odds of graduation in four years, students who had library instruction were significantly more likely to still be enrolled after four years.

Results are summarized in Table 1 and fully described in our forthcoming paper.[26]

Table 1. Likelihood of continued enrollment and graduation in four years against withdrawal from the university

Library Use	Continued Enrollment	Graduation in Four Years
Any library resource	1.389 times more likely	1.441 times more likely
Electronic resources	1.450	1.924
Books	No effect	1.337
Workstations	No effect	No effect
Library instruction	1.402	No effect
Peer/Reference	No effect	No effect

Limitations and Possible Improvement

Although propensity score matching helps create balanced groups of library users versus non-users for analysis, we still do not know that we have accounted for all of the factors that might affect whether or not a student chooses to use the library. We will continue look for and evaluate possible contributing factors so we can add them to future analyses.

For example, we have another set of data available for the 2012 cohort: the CIRP (Cooperative Institutional Research Program) Freshman Survey administered by the Higher Education Research Institute. We know from previous (unpublished) analysis that factors such as the student's self-reported academic motivation while in high school seem to affect whether or not the student uses the library in his or her first year of enrollment. Since we have this self-reported information for the 2012 cohort, we could enhance the propensity score calculation by adding responses to the questions from the survey that seem to be relevant to the students' choice to use library resources and services.

What Now?

As we continue to demonstrate correlations between library use and student success and timely graduation rate, we are pondering what to do next.

Better Data Collection

Throughout the five years of our ongoing study, data collection has remained a moving target. For example, in 2014 our libraries migrated to a new integrated library management system (Ex Libris Alma), new discovery layer and website (Primo + Primo Central Index), and new authentication system. We had to reevaluate data collection processes to identify data points similar to what we had been using.

Another challenge is the time and effort to collect usage data on some of our access points, such as instruction. We feel instruction data is vital to the project but it is also the most time consuming to collect and some of the most suspect. We are seeking to balance the time spent collecting data with the value of the data analysis to the libraries, the university, and the students.

We would like to gather additional data sources, such as "card swipes" at service points. Such additional data collection decisions require careful consideration so that students are not discouraged from making use of our services, their privacy is preserved, and the libraries are able to derive information from the data that benefits the students.

Working with Campus Partners

We are striving to raise our visibility as a meaningful campus partner in academic engagement. We use this work to show potential partners that we are an important part of a student's experience on campus and a potential contributor to each student's success. This requires bridging the academic services and student services divide.

We have been nurturing our relationship with the professional academic advisors on campus. Each of our undergraduate colleges employs college level advisers. These advisers work with students in their first two years of college and help with a wide variety of support services such as registering for classes and timely connections to needed resources like financial aid, mental health, and tutoring. Students generally work with a major adviser in their junior year once they have declared or applied for their major.

Our campus uses an Integrated Planning and Advising Service (IPAS)[27] called APLUS. This system seamlessly connects advisers with services on campus like financial aid counselors or study abroad advisers or academic tutoring, for example. The libraries have been able to become part of this ecosystem in two ways. First, advisers have told us that it would be useful to know whether a student had completed an introductory library workshop (generally part of the first year writing course). Therefore, on a weekly basis, we feed data into APLUS by sending names of students who have completed the workshop. The student's record lists that workshop alongside other contacts. This data point added to the rest of the information in a student's record can help give a more complete picture of student engagement.

Our second APLUS integration involves referrals from advisers to the libraries. For example, after talking with a student who expresses worry over an upcoming research paper, the adviser could ask the student if they want a librarian to contact them. If the answer is yes, the adviser could add a tag. This generates an alert to the libraries. We then contact the student directly and offer the appropriate services.

Although this referral mechanism is in pilot phase and has had lower usage then we had hoped for, we have seen examples from both ends of the academic spectrum. For example, we have had alerts for first-year students who are new to the libraries and academic research. We have also had alerts for upper level students who were interested in getting involved in sponsored research on campus and needed help identifying articles written by a faculty member with whom they were interested in working.

By working with advisers, we hope to see whether there are differences between students who are not using library resources at the same rate as more successful students. Could lack of library use be seen as a "pink flag"?[28] It is unlikely that the lack of library use is on par with more dramatic "red flags" such as missing a significant number of classes. However, it may be a factor that could help students and support staff discover a gap or need while they are still able to take action.

Clearly, using the library is not the same in every major or course, and library data needs to be analyzed to take that into account. Through this work, we are poised to participate in campus discussions around what data to feed into learning analytics systems and other assessment tools. As work continues on initiatives like predictive analytics, library data may prove to be one useful measure to demonstrate student's academic engagement or academic disengagement.

This work is not just about individual student behavior. Libraries must examine our own gaps and find places where we can help to induce students towards meaningful educational opportunities.[29] This could take many forms ranging from orientation and outreach activities for all incoming students—both first-year and transfer students—to programs aimed at reaching specific populations such as low income, first generation, students of color, international students, etc. This is continually challenging as library budgets are in decline, but we believe it is vital work for our students' success and our institution's success.

Jan Fransen, Service Lead for Researcher and Discovery Systems, fransen@umn.edu
Kate Peterson, Undergraduate Services Librarian, katep@umn.edu
University of Minnesota, Twin Cities

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Academic Libraries and Student Retention: The Implications for Higher Education

Mary O'Kelly
Grand Valley State University, USA

Abstract

Grand Valley State University (GVSU) in Allendale, Michigan, has found a statistically significant correlation between library instruction and student retention, and also between faculty who invite library instruction and student retention. By putting these findings into the context of both existing literature on the relationship between library use and student success and of established models of effective higher education practices that contribute to student success, a line begins to form between intentional engagement with the library and high-impact practices.

Introduction

Attracting and keeping students is a high priority in higher education, and academic libraries are examining the ways they might be contributing to student retention. Some have looked for a relationship between library instruction and retention,[1] others have looked for it between library use and retention.[2] This paper reviews the existing literature on academic libraries and student retention and presents the role of the classroom professor in driving library use. We will take a step back from the discrete factors correlated with retention and instead look at the possible faculty effect on library use and inquire whether the growing body of evidence of library value has broad implications for higher education. In other words, the library—and all its spaces, services, and resources—is not causing retention but rather is a conduit by which effective teaching faculty direct their students to the library as a critical academic support service.

The high-impact educational practices identified by George Kuh[3] and the Association of American Colleges and Universities (AAC&U) include several activities that are directly or indirectly supported by libraries. Many academic libraries provide first-year seminars or workshops. They collaborate with other campus support services to offer cocurricular programming and common intellectual experiences. They support writing-intensive courses that have high levels of information literacy content through direct instruction and librarian consultations. They offer mentoring and resources for undergraduate research projects. They also send librarians into capstone classes for in-depth instruction in advanced library research.

Each of these practices, often led or initiated by teaching faculty, drive student use of the library. Student use of the library is correlated with student retention in several studies. Faculty influence whether a student uses the library, whether through direct assignments or cocurricular programs. Therefore, as this paper proposes, faculty engagement with the library, including encouraging student use of the library, is a contributing factor to student retention. Is library use a high-impact practice?

Correlation between Library Instruction and Student Retention

Grand Valley State University (GVSU), a large comprehensive university in Michigan, has been exploring the relationship between library instruction and student success. Every year since 2012 a statistically significant positive correlation has been found between in-class library instruction led by a librarian and whether or not a student reenrolls the following fall semester,[4] which is how we defined retention. Library instruction is invited sessions in another faculty member's course, not credit-bearing information literacy courses. The students who attend come as an entire class with their professor to participate in librarian-led activities. Highly motivated students may attend library workshops by choice, or check out books, or log into databases, and intrinsic motivation can be a complicating factor in measuring student success. By using whole-class data, classes in which students were not given a choice whether to attend the library session, self-selection and motivation biases are better controlled.

In that study,[5] the library and the university's institutional research department worked together to answer over 30 questions about library instruction and the students who participated, ranging from how many students were in those instruction sessions to the big questions about retention and grade point average (GPA). (To ensure student privacy, all student data stayed in the institutional research department and was reported to the library in aggregate only.) The analysis included only those courses that had at least one library session so that there could be reasonable comparison between students in a specific course who saw a librarian and those in the same course who did not. This eliminated single-session courses such as internships, independent study, music instruction, etc.

The analyst used a chi-squared test of independence using SAS and a fixed p-value of .05 to test significance. We controlled for ACT score, high school GPA, socioeconomic status, and first-generation status using a generalized linear model. Odds ratios were calculated to determine the magnitude of difference.

The findings are statistically significant and have been replicated for four years. The magnitude is positive—but small. We know that something is happening but have not yet determined the cause or the direction. The study also was limited by human error in the instruction data entry and by estimated attendance (enrollment figures were used for attendance; librarians did not collect student names in class in order to further protect privacy). Online instruction ramped up significantly in 2016 but has not yet been analyzed. We also acknowledge that these results are unique to this institution and are not generalizable.

All of that is shared here as background on why we were inspired to dig deeper into the results. Retention is very complicated and numerous factors, many of which are unmeasurable, contribute to whether a student stays in college. There is no evidence that library instruction causes an increase in student retention but there is considerable and growing evidence that library use is a factor.

Correlation between Faculty and Student Retention

So there may be a relationship between retention and library instruction, but there is no evidence for causation and plenty of confounding variables. One of those variables is classroom faculty. We were curious if flipping our data to focus on the faculty, instead of the library instruction, would reveal any interesting correlations.

Using the same student enrollment and library instruction data, we asked the analyst to compare *students who had at least one faculty member invite a librarian to teach an information literacy session* to *students who did not have faculty who invited a librarian.* The hypothesis is that faculty who engage with the library via library instruction are also likely to be more effective, perhaps by engaging with other high-impact practices that positively influence retention. For example, those faculty might be assigning undergraduate research projects or encouraging their students to use academic support services, which are known practices that contribute to student success—and are likely to require library services and resources.

Table 1 shows how many students had a faculty member who worked with a librarian to offer library instruction in class, the percent of those students who reenrolled the following semester (our definition of retention), the p-value at which significance was tested, and the odds ratio showing the magnitude of difference.

Table 1: Correlation between faculty engagement with the library and student retention

Year	Faculty who invited library instruction	Number of students	% Retained	P-value	Odds Ratio
2014–2015	No	7555	71.30		
	Yes	10825	74.70	.0001	1.19
2015–2016	No	6583	70.67		
	Yes	12030	74.39	.0001	1.20

Students who had at least one professor work with a librarian—regardless of whether those students saw a librarian in their own classes—were retained at a statistically significant higher rate. These are not students who necessarily had library instruction; these are students who have faculty who invite library instruction. It is unknown why those faculty plan library instruction in their courses; possible reasons include (but are not limited to) valuing information literacy, accreditation requirements, encouragement from unit heads, or department culture.

Perhaps faculty who plan for and invite library instruction are more aware of and actively involved with high-impact practices that support student success, and perhaps library use is one of those practices. It is an interesting finding that, using the same population of students and faculty with the same analysis methods, students who receive library instruction are retained at a higher rate, and students who have faculty who work with a librarian on instruction are also retained at a higher rate.

Granted, the reasons that students who have these library-engaged faculty are reenrolling may not have anything to do with the library. Retention is complex. This preliminary evidence warrants replication and further examination.

Retention in the Literature

Library use has been connected to student retention, persistence, and GPA in several studies. Murray, Ireland, and Hackathorn looked at general library use (such as logins, checkouts, gate counts, instruction, and interlibrary loan) and found a predictive relationship between library use and retention of freshmen and sophomore students.[6] Soria, Fransen, and Nackerud studied whether library use is related to first-year student retention.[7]

Others have looked at library use and student success using methods ranging from self-reported surveys,[8] collection of student user names at various library service points,[9] comparison of student identification numbers to proxy logs,[10] comparison of student enrollment data and library management system data,[11] and correlation analysis between library material use and GPA.[12] Together, along with the evidence collected by the Association of College and Research Library's (ACRL) Assessment in Action project,[13] they suggest a significant link between the library and student success.

Just outside the realm of direct student use of the library, researchers also have found relationships between library staffing and student retention[14] and between library expenditures and retention.[15] Although these findings are more indirect measures of library activities and student retention, they report a connection between well-supported libraries and student retention.

The ten high-impact practices identified by AAC&U[16]are well integrated into the curriculum at GVSU and other institutions. The practices are:

- First-year seminars and experiences
- Common intellectual experiences
- Learning communities
- Writing-intensive courses
- Collaborative assignments and projects
- Undergraduate research
- Diversity and global learning
- Service and community-based learning
- Internships
- Capstone courses and projects

Each practice has elements that are supported by existing library services and resources. For example, GVSU libraries support campus learning communities. Liaison librarians are embedded into several learning communities, offering on-site office hours, one-to-one research consultations, and custom tours of the library. First-year seminars and experiences are popular high-impact practices; GVSU has a dedicated first-year initiatives librarian and a long-standing, strong relationship with the introductory freshman writing course.

Recent literature is starting to illuminate the trail between high-impact educational practices and library use. Kilgo, Sheets, and Pascarella took a broad look at high-impact practices at 17 institutions and found strong correlations between some of those practices (including undergraduate research, which often relies on library services and resources) and educational outcomes.[17] In a different approach, Murray found that library deans believe their libraries are involved in many high-impact practices and were able to map specific library activities—library instruction in particular—to discrete high-impact practices.[18]

Several theories and models, beyond Kuh's high-impact practices, further support the relationship between student success factors and academic libraries. In one psychological model, four types of

educational programs are shown to increase student success: service learning, learning communities and freshman interest groups, freshman seminars, and mentoring programs.[19] It is easy to find connections between these programs and library programming, such as the proliferation of first-year experience programs, peer-to-peer research consultations in information commons, librarian faculty research mentors, and embedded librarians. Another useful model, Tinto's model of institutional action, posits four conditions that foster success: clear and high expectations; academic, social, and financial support; frequent assessment and feedback; and active engagement with faculty and other students.[20] These, too, can be used to more clearly articulate the role of the library.

Connections between High-Impact Practices and the Library

One way to look at the library's relationship to these practices is by simply drawing a map of high-impact practices and library resources and services (Figure 1). This sample map is not exhaustive but it does start to show a complicated mix of direct connections with extreme fragmentation of those connections. In other words, each of these elements—study space, services in those spaces, collections available in those spaces—are separate from each other when conceived this way, displayed as if they are connected only to the high-impact practice but not as part of a comprehensive, strategic library program.

Figure 1: Map of high-impact practices and library resources and services

Despite the fragmentation of this kind of visual model, it does demonstrate how deeply embedded libraries are into campus programs. Librarians work with classroom faculty on assignment design for capstone courses. They select discipline-specific resources and, when needed, make them accessible to students in online courses. Libraries provide different study spaces for different student needs—quiet corners, group study rooms, open collaborative areas, tutoring centers, computer labs—and stock those spaces with everything from coffee and lounge chairs to peer mentors and career advisors.

If, for example, undergraduate research is such a key practice, as asserted in the literature, and if undergraduate researchers are dependent on the library, perhaps the library is inseparable from the best practice.

Pulling It All Together

Research shows a correlation between library instruction and student retention, between multifaceted library use and measures of student success (including retention, GPA, and persistence to graduation), and between library services and

resources (both human and physical) and known high-impact practices. Through national programs like Assessment in Action, libraries are building capacity to more closely and rigorously investigate those relationships in order to measure and share the value of academic libraries within their institutional contexts.

We look for library factors and yet we also may be finding faculty factors. Faculty drive student use of the library. At GVSU there appears to be a correlation between faculty who engage with their librarian (and presumably encourage their students to do the same via library instruction and research-related assignments) and student retention. Using Tinto's aforementioned model of expectations, support, assessment, and engagement as a lens, we see how the library is woven throughout.[21] We see that the faculty role is to set high expectations for quality scholarly sources. Faculty frame the library as a source of academic support. Faculty assess and stress the importance of information literacy skills. And faculty and students alike engage with the library and each other through scholarship.

So, if student retention is correlated with library use, and with faculty engagement with the library, and with faculty who encourage student engagement with academic support services, and with student engagement with faculty, and with library-intensive high-impact practices such as undergraduate research, writing-intensive courses, and first-year experiences, is library use the eleventh high-impact practice?

Figure 2. Map showing engagement with the library as a high-impact practice

As ACRL and OCLC Research begin the development of a new research agenda, and individual libraries refine their own strategic plans, inquiries such as the one presented in this paper provide a framework for further exploration. Large-scale, longitudinal, high-n, replicable studies of the relationship between library use and student retention are rare in academic literature. Higher education is intensely focused on student retention and, as fully integrated and essential academic services, academic libraries have a critical role to play in contributing to that conversation. Development of a specific line of inquiry—and all associated definitions, assumptions, and analyses—into whether library use is a separate high-impact practice would be new and challenging. Regardless of the outcome, such structured exploration would help further identify the strongest relationships between academic libraries and student success. And, if subsequent evidence does support it, this reframing of impact has implications for expanding the way higher education approaches effective learning for diverse populations by articulating one

more effective, attainable, and realistic practice: engagement with the academic library.

Endnotes

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What Do We Want to Know: Completing an Action-Oriented Research Agenda

Lynn Silipigni Connaway and William Harvey
OCLC, USA

Vanessa Kitzie and Stephanie Mikitish
Rutgers University, USA

Introduction

Because of growing federal and organizational pressures, academic libraries now must demonstrate their value more than ever.[1] The Association of College and Research Libraries (ACRL) has been at the forefront of assessing these demonstrations and recognizes the need for more research on student learning and success, areas critical to the higher education sector. After an open and competitive request for proposals issued by ACRL to investigate this area, a team from OCLC Research and two doctoral candidates from Rutgers University were selected to support this ongoing work. The project team will develop an action-oriented research agenda on library contributions to student learning and success.

This paper provides some of the first published work by the project team on the initial project phase. In this phase, the team has worked to identify current definitions of learning and success, as well as higher education trends and librarians' responses to these trends, by performing a content analysis of relevant literature. This content analysis is preliminary and covers a little less than half of the total documents reviewed. The findings from this preliminary content analysis suggest pathways for additional work within this first project phase and inform the team's progress through the next project stages. The findings communicate some of the initial emerging themes that will serve to structure the writing of the final report, due in May 2017.

Background

One significant challenge in assessing academic library value is the lack of consensus on measures of student learning and success.[2] Often, determining these measures is left up to individual departments, which can result in the assessment practices of libraries being isolated from those of higher education stakeholders. This lack of synergy renders it difficult for libraries to demonstrate their impact in a way that aligns with stakeholder objectives. Perhaps for this reason, or because of it, librarians often are not included in discussions of value within a broader academic context, such as how they might contribute to accreditation standards and affect student retention and achievement.[3]

ACRL issued a request for proposals (RFP) in May 2016 to address these challenges by answering the following research questions:

RQ1. What are the ways that libraries align with and have impact on institutional effectiveness?

RQ2. How can libraries communicate their alignment with and impact on institutional effectiveness in a way that resonates with higher education stakeholders?[4]

Guided by the proposal directives, the project team is engaging in the following stages to answer these research questions:

1. Overview current definitions of learning and success and identify higher education trends that affect academic librarians as well as how librarians respond to these trends.
2. Collect individual and focus group interview data from provosts and academic librarians who are members of an advisory committee for this project and, based on these data, identify extant programs and services that have evidenced effectiveness of or potential for contributing to student-centered outcomes.
3. Identify understudied research areas for newer practitioner-scholars by asking future-focused

research questions and creating a dynamic visualization tool.

These stages, while initially linear, will become iterative as both the research findings and feedback from ACRL members will inform and guide the project. This paper reports on the team's initial findings from the first stage of the project. First, a brief literature review is presented that overviews some of ACRL's work on the value of academic libraries and how it informed the development of the codebook that was used to identify the themes of 194 readings that align with higher education trends and measure student outcomes. Next, an overview of methods is provided, followed by a presentation and discussion of findings from these key studies and thematic pieces. The paper concludes by outlining key takeaways from the work completed to date by the team.

Literature Review

The ACRL RFP specified several of its publications as key documents for review.[5] This literature review provided the team with several themes and factors that formed the basis of an initial codebook (see Appendix A for the codebook). Some of these publications are summarized below to exemplify how these codes were selected.

ACRL's 2010 *Value of Academic Libraries* report provides an overview of how academic librarians articulate value to higher education stakeholders and identifies 10 areas of library value. Areas informing the codebook include: student enrollment, retention, and graduation; success; achievement; learning; and support of faculty teaching. Based on these identified areas, the report concludes with a series of recommended next steps. The steps having most relevance to this project detail the importance of the academic library to not only establish student outcome measures, but also to document and communicate outcome attainment to higher education stakeholders, as well as engage in higher education assessment initiatives.[6] While the determination and establishment of outcome measures must be made, there appears to be a significant need to link these outcomes to a broader higher education context beyond the library walls.

Based on these recommendations, ACRL created an action-oriented project, Assessment in Action (AiA), which built a community of practice around assessment among more than 200 higher education institutions. Findings from the shared assessment methodologies and tools informing the codebook denote the effectiveness of library assessment when libraries collaborate with other campus units, assessment aligns with institutional goals, and mixed methods approaches are employed. Codebook values also incorporate findings that emphasize the contribution of library instruction and spaces, and collaborative instructional activities, instructional games, and multiple instruction sessions, to student outcome measures.[7]

To capture the broader, higher education context of assessment, ACRL also completed an environmental scan[8] and identified trends in higher education.[9] The environmental scan indicates growth of interest among higher education stakeholders in linking the following areas to outcome measures: research data services, discovery services, and the library as a place for student success.[10] These areas are mirrored in the trend report, particularly the importance of the library in supporting digital scholarship. The report also explains how information literacy assessment has changed to include how it contributes to student and institutional-level outcomes.[11] As with the prior pieces in the literature review, these identified areas informed development of the initial codebook.

Methods

After completing the literature review, the team had a list of proposed codes for an initial codebook. These codes are divided between two schemes: (1) thematic codes, which indicate higher education trends to which libraries are responding and (2) factors of inquiry. The factors of inquiry scheme captures the demographics of the literature, such as year written, geographic location of the institution studied, and type of method employed, if the document is a study. Factors of inquiry were collected to make the studies more accessible and findable when using the visualization tool the team will develop at a later project stage. Specifically, these factors can be queried against higher education trends to provide practitioner-scholars with an overview of the current state of research on assessment within a broader higher-education context.

The team then searched in both higher education and library and information science (LIS) databases for literature that aligned with the themes identified in the literature review. Selected higher education databases were Academic

Search Premier, Education Resources Information Center (ERIC), ProQuest Education Journals, and Teacher Reference Center. Selected LIS databases were Library and Information Science Abstracts (LISA), Library Literature & Information Science Full Text (H.W. Wilson), and Library, Information Science & Technology Abstracts (LISTA). Search delimiters narrowed the results to studies conducted since 2010 addressing student outcomes and mentioning libraries.

The team then reviewed the retrieved documents considering the project's key research outcomes and questions, adding and removing documents as necessary. A total of 194 documents were added to the report bibliography and designated as either a key thematic piece (n=53), key study (n=38), other thematic piece (n=43), or other study (n=60). The designations "key" and "other" were based on the alignment of each piece within the thematic coding scheme. Pieces coded as thematic identify a higher education trend or a library response to that trend where no research or study was conducted, e.g., literature reviews.

All documents were imported into NVivo, a qualitative analysis software program. Using the codebook, two members of the project team coded 20% of the documents. Coding was both quantitative, i.e., looking for the presence of a certain word or words to indicate a code, and qualitative, i.e., inferring the meaning of a code. The team members reviewed the codes, discussing any coding discrepancies and revising the codebook to reflect them, and achieved 95% agreement for the factors of inquiry scheme and 99% agreement for the thematic scheme. The two team members then compared coding with a third team member, again discussing any coding discrepancies, and revising the codebook to reflect them. Following this discussion, the team attained 100% agreement for both coding schemes on 20% of the documents. To code the remainder of the documents, the team used NVivo's text query for an agreed-upon selection of words that would identify thematic factors for the studies and thematic pieces. Then a coder reviewed the entire document with the queried words identified to facilitate coding.

All codes are binary, meaning that each reading either has a code of "0" or "1" to indicate absence or presence of a code, respectively. All documents (n=194) had the thematic coding scheme applied to them, while only studies (n=98) had the factors of inquiry coding scheme applied. The next section, which discusses findings, relies on descriptive analysis. Specifically, the total number of codes applied to all the documents was calculated as well as the percentage of documents containing each code. In some instances, basic statistics were also calculated, e.g., mean, median, standard deviation.

Findings

Figure 1: Word cloud of thematic codes for all readings (n=194). Sizes reflect the number of documents in which each theme was present.

Table 1. Number of readings per thematic code (n=194)

Code	*n*	*%*
Service	153	79
Success in college	102	53
Learning in college	101	52
Research support	92	47
Collection	92	47
Assessment	91	47
Collaboration	88	45
Space	80	41
Teaching support	74	38
Communication	60	31
Provision of tech	60	31
Inclusivity/Diversity	47	24
Accreditation	28	14

The thematic coding scheme indicates the presence of higher education trends, e.g., accreditation, provision of technology, and the libraries' response to these trends, e.g., service, collection. All documents were coded for the presence of codebook themes, with Figure 1 and Table 1 indicating how often the themes were discussed in the readings.

As indicated by Figure 1 and Table 1, it appeared that each theme was coded in a little less than half of the documents and most themes were discussed evenly across the documents. This observation was also confirmed by the central tendency statistics, in which the mean (n=83, 43%)[12] and median (n=88, 45%) are close together. Since the median is greater than the mean, the distribution is slightly skewed left, meaning that there are slightly more thematic codes applied to a greater number of documents than indicated by the mean. Codes least frequently applied include: provision of technology (n=60, 31%), communication (n=60, 31%), inclusivity/diversity (n=47, 24%), and accreditation (n=28, 14%). While none of these codes are outliers, which may be defined as data points more than two standard deviations from the mean (s.d.=31, 16%), it can be observed that the codes inclusivity/diversity and accreditation appeared to not be as frequently discussed in the literature. One outlier does exist among the thematic codes—service (n=153, 79%). It may be concluded that this theme is disproportionately addressed as a library response in the literature.

Figure 2: Percentage of documents with each thematic code, divided by whether each is designated as thematic (key, other) or study (key, other).

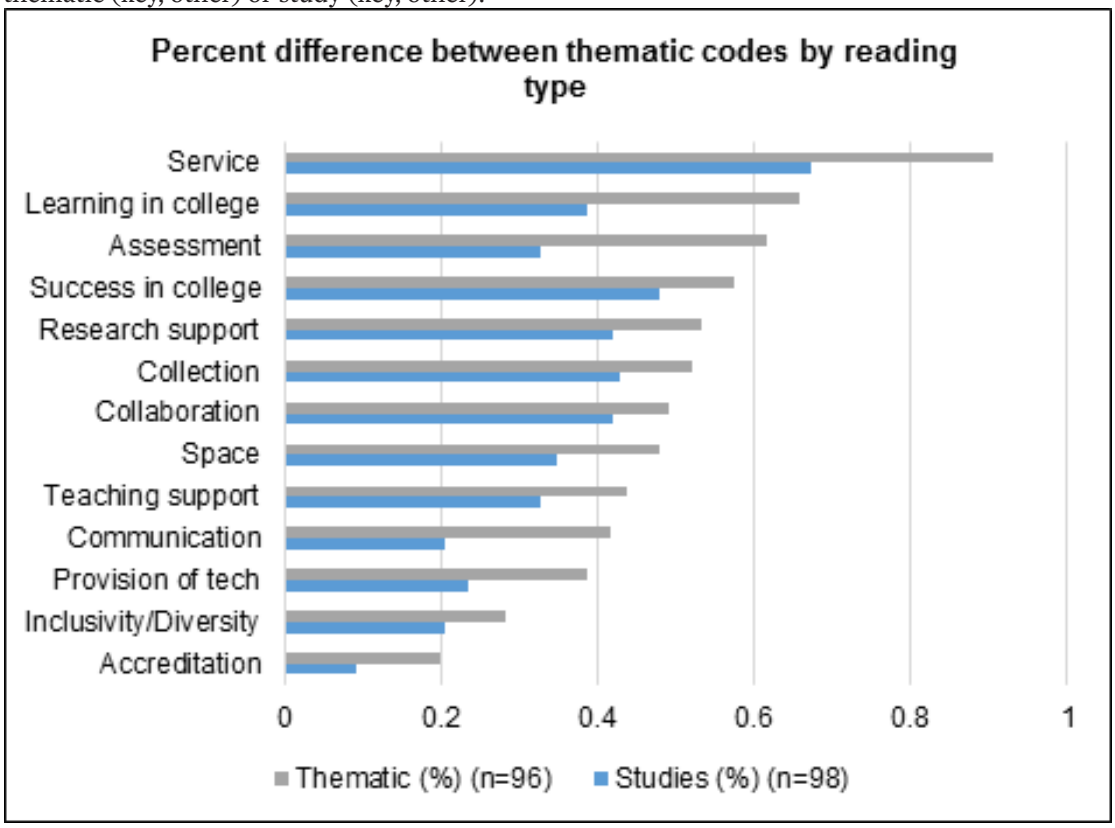


Table 2. Thematic coding changes over time (all values %)

	2010	2011	2012	2013	2014	2015	2016
Accreditation	24	21	7	17	9	18	11
Assessment	52	53	50	43	38	51	44
Collaboration	38	26	37	33	56	64	50
Communication	33	32	20	37	26	36	33
Inclusivity/Diversity	38	16	17	20	18	28	44
Learning in college	43	53	30	40	47	59	61
Provision of tech	33	26	33	33	35	31	22
Research support	43	47	53	60	47	44	28
Success in college	52	32	40	63	35	74	67
Teaching support	24	32	30	50	35	38	61
Collection	43	53	67	60	44	26	44
Service	76	84	73	80	71	56	56
Space	43	16	47	47	35	46	44

One question the team had after reviewing the initial round of thematic coding results was whether application of codes might vary by type of document (study, thematic) and year published (2010–2016). When comparing the application of thematic codes by document type, thematic readings tended to have more thematic codes than studies—approximately 15% more codes (see Figure 2). A likely explanation for this observation is that thematic documents include genres such as literature reviews and lists, whereas studies empirically ground a phenomenon or phenomena observed among one or two themes. Even considering this explanation, there were four codes that have more than a 15% mean difference between thematic and study types: assessment (29%), learning in college (27%), service (23%), and communication (21%).

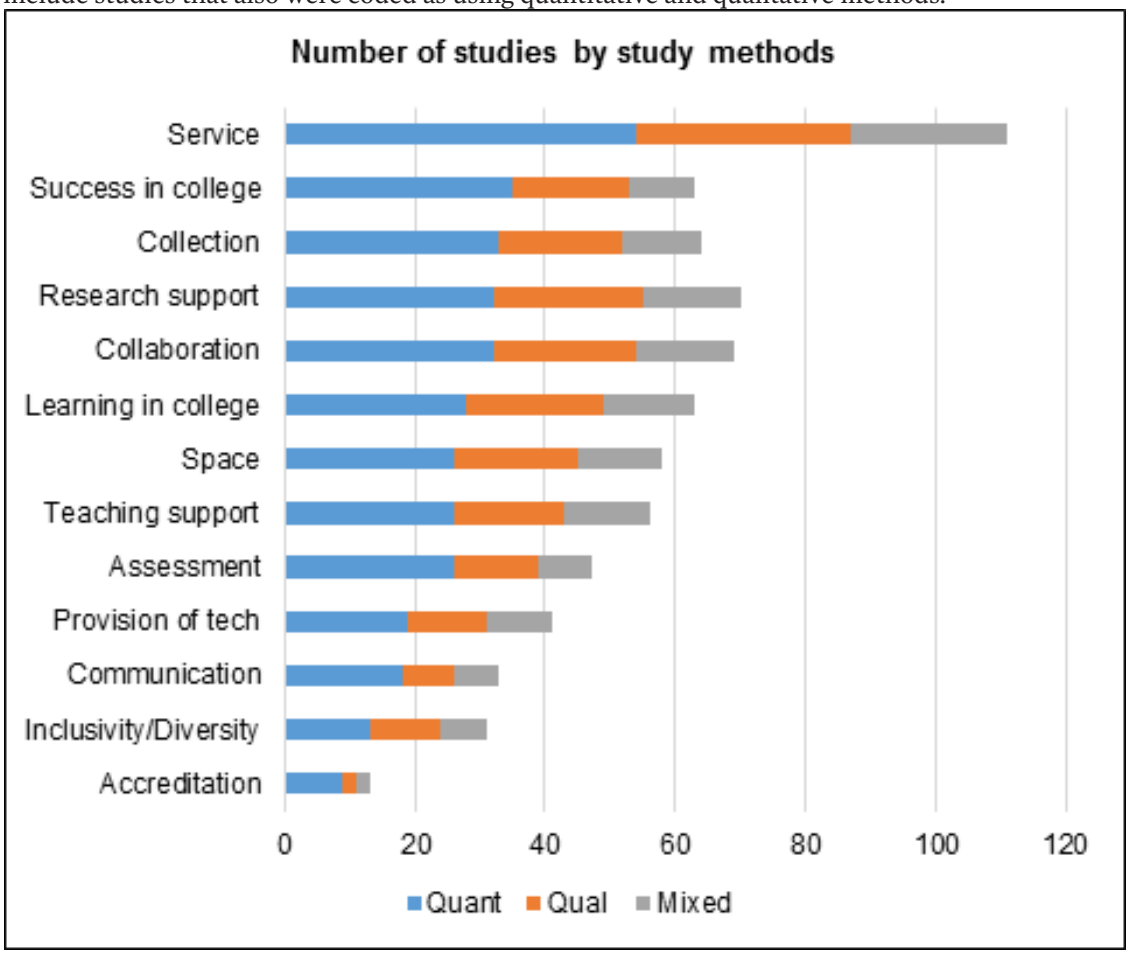
Most variations between the number of thematic codes by year were minor (see Table 2). Categories that appeared to trend in a specific direction over the course of more than two years include collaboration, inclusivity/diversity, learning in college, research support, teaching support, and service. These observations only can be made anecdotally, however, given that a random sample of all relevant literature

would need to be drawn and analyzed and inferential statistics performed to quantify application of any of these codes as trends.

Another part of the team's initial analysis included analyzing studies (key, other) coded using the factors of inquiry scheme. Of the 194 documents, 98 (51%) were classified as studies. Of the 98 studies, 32% focused on multiple institutions (n=31) and, when specified, 28% of the institutions studied were outside the US (n=27). When in the US, 17% of studies took place at institutions in the South (n=17), 15% in the West (n=15), 14% in the Midwest (n=14), and 8% in the Northeast (n=8). Most institutions were public (n=61, 62%), few were private (n=10, 10%). Most also were universities (n=67, 68%), with few colleges (n=6, 6%) and community colleges (n=4, 4%). Many studies employed quantitative methods (n=75, 77%), with half of the studies using qualitative methods (n=50, 51%). A smaller portion (n=32, 33%) employed mixed methods.

The team decided to cross-query some of the factors of inquiry codes, namely study method (qualitative, quantitative, mixed), against the thematic codes. Figure 3 depicts these results. While there appeared to be some variation of thematic codes by method, e.g., more use of quantitative methods in studies measuring assessment, inferential statistics would be required to measure whether any of this variation is statistically significant given the difference in the number of studies using each method.

Figure 3: Number of thematic codes present in studies divided by method. Note that mixed methods studies include studies that also were coded as using quantitative and qualitative methods.



Discussion

The team's initial findings suggest several observations about the current state of library assessment research. As noted in the literature review, librarians often have difficulty articulating their value to higher education administrators

and other stakeholders, and do not appear to be included in discussions related to higher education outcomes, such as accreditation.[13] A review of the current literature suggests that the accreditation, technological provision, and communication themes are among those least present in the readings. While the inclusivity/diversity theme was not prominently discussed in the required ACRL documents, findings from Table 2 denote inclusivity/diversity as an emerging means through which to demonstrate library value. The team has determined that this theme is a fruitful one to explore, however, caution must be given when tying a social justice issue to outcomes ultimately linked to monetary gain.

When comparing the application of thematic codes to thematic documents versus studies, it becomes clearer that assessment and communication are two topics deemed important as themes, but are not often empirically measured, as would be indicated by being themes present in studies. Another topic that appears to be discussed more than it is empiricized is learning in college. This finding may relate to Oakleaf's observation that librarians have trouble documenting non-quantitative outcomes.[14]

The team noticed that collaboration was an emerging thematic code in the readings selected for content analysis. The importance of collaboration between librarians and individuals outside of the library, e.g., faculty, administration, also is addressed in the required ACRL documents. The smaller portion of studies employing mixed methods approaches also confirms findings from the literature review of required ACRL documents that few assessment-oriented studies choose mixed methods. Given the richness of findings found in assessment studies using mixed methods,[15] their absence from empirical assessment work suggests an ongoing, problematic gap.

Although observations only can be drawn at this initial round of data analysis, the team's ability to query across different coding schemes (thematic, factors of inquiry) depicts the building blocks for the visualization tool that will be built at a later stage of this project. Much like the team could display the results for queries such as *How many studies measuring success in college use mixed methods?* (n=10, 10%), the library practitioners will be able to run their own queries to not only aid in discovery of relevant literature, but also to assist the librarians in drawing their own conclusions and inferences about what should be done to address the current landscape of library assessment.

Conclusion

The preliminary analysis of the literature suggests that librarians are not empirically measuring issues of interest as indicated within the thematic literature. These topics include outcomes such as accreditation, communication, and the provision of technology. These preliminary findings help to explain why librarians have difficulty articulating value to the academy—they do not seem to be focusing on the same topics within the studies they conduct as those emphasized as important within thematic pieces that they write. The latter often are geared toward higher education administrators, indicating the disparity between what librarians are doing versus what topics are of importance to higher education administrators and decision makers. One topic that may be easy for librarians to address is the provision of technology. With the importance of data management and technology for teaching and learning, librarians could offer faculty, students, and researchers ways to integrate technology into their workflows and the library could offer the infrastructure. In addition, librarians do not seem to be focusing on communication, which is crucial when advocating for any cause, including the library.

Another interesting preliminary finding is the minimal amount of empirical methods associated with the study of assessment and communication in the literature. To articulate the value of services offered by the library to the academic community, both qualitative and quantitative data are needed to demonstrate this value. Yet the analysis of the literature indicates a small number of assessment-oriented studies use mixed methods. This gap is something that LIS education and continuing education programs could address in course offerings. If librarians were educated to use mixed methods, they would feel more comfortable using them to articulate the value of their services to the academic community. The minimal use of mixed methods is surprising since the library literature indicates a disproportionate number of papers addressing library service. Again, to measure the effectiveness of library services, it is critical to augment the discussion with data.

Although there are gaps in the literature, there also are themes addressed that indicate that librarians are aware of some of the trends in higher education.

These include assessment, research support, teaching support, learning in college, success in college, and collaboration. These are important in higher education and on the librarians' radar. This inclusion of these themes in the literature indicates that librarians have identified areas where libraries can make a difference. Now they may need to focus on how to measure the effectiveness of these efforts to articulate the value they bring to the academic community.

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12. All numbers rounded to the nearest one.

13. ACRL, *Value of Academic Libraries*; Broady-Preston and Lobo, "Measuring the Quality, Value and Impact of Academic Libraries"; Matthews, "Assessing Organizational Effectiveness"; Vance, Kirk, and Gardner, "Measuring the Impact of Library Instruction on Freshman Success and Persistence"; Hosseini-Ara and Jones, "Overcoming Our Habits and Learning to Measure Impact"; Hufford, "Can the Library Contribute Value to the Campus Culture for Learning?"; Albert, "Communicating Library Value."

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Appendix A: Codebook

Thematic coding scheme
Identify the appropriate library response (collection, service, or space) discussed and that can be inferred based on the codebook definitions.

All trends and studies in this report deal with student outcomes. However, trends may involve other stakeholders as indicated below.

Higher education trend	Trend defined	Example of library responses to trend
Students		
Learning in college (and beyond)	Outcome was focused on the less objective concepts of learning, such as critical thinking. Usually not tied to a specific graded assignment or graduation.	Service: Library instruction Space: Collaborative working space for students Collections: Repository of online tutorials not linked to a specific class
Success in college (for multiple student groups)	Outcome was focused on the more objective indicators of learning, such as GPA or grades. Usually tied to a specific graded assignment or graduation.	Collections: Physical collections Collections: Digital collections Space: Study spaces Service: Library instruction Service: Collection discovery
Students/Faculty		
Research support	Outcome was tied to research outside of a class.	Collections: Physical Collections: Digital Service: Data storage Service: Consultation Service: Teach data management Service: Teach data mining methods Service: Collection discovery Space: Research (as opposed to learning) commons
Faculty		
Teaching support	Outcome was viewed from an instructor perspective, and it deals with a specific course.	Service: Library instruction Service: Help instructors manage pedagogical and curricular changes Collection: Online repository of syllabi Space: Faculty development center

Higher education trend	Trend defined	Example of library responses to trend
Institution		
Accreditation	Accreditation-related student outcomes	Service: Help institutions meet federal guidelines/requirements
Assessment (driven in part by affordability of higher ed)	Institutionally identified student outcomes (can be co-coded with learning and success)	Service: Educate library and other employees Service: Align with institutional mission
Provision of technology	Outcome also dealt with hardware/software that affect student outcomes	Service: Provide expertise for data management Space: Provide hardware and software in Makerspaces
Other thematic codes (does not have to align with library service, space, or collection)		
Inclusivity	(Possibly) marginalized groups	First generation college students; People of color; Commuters; Distance learners; English as a second language; Lower socioeconomic level
Collaboration	Librarians work with other institutional departments to impact student outcomes or with other institutions	Collaboration could be intra-institutional (e.g., with institutional planning unit; faculty) or inter-institutional (e.g., with multiple institutions)
Communication	Librarians communicate impact or other aspects of value with stakeholders	

Factors of inquiry coding scheme

Code name	Code definition	Values
Year	Year study was published	2010–2016
Geographic location	Major geographic regions as defined by census at: http://www.census.gov/econ/census/help/geography/regions_and_divisions.html or outside of the US where the study was performed; Do not code if institutions were in different regions	Northeast; Midwest; Outside the US; South; West
Type	Type of institution where the study was performed; Do not code if multiple institution types were studied	College; Community college; University
Sector affiliation	Whether institution was public, private, secular, or non-secular; Do not code if multiple institutions are not the same	Private; Public
Multiple institution	Code if study involved multiple institutions	Multiple institutions

Code name	Code definition	Values
Outcomes	Specific student outcomes that are are tied to a more objective qualitative or quantitative indicator of learning for a specific assignment, class, or graduation. Can choose up to 2.*	Enrollment; Graduation; Learning; Retention; Student engagement; Student success
Library service	Library service studied	Collections; Discovery; Instruction; Reference; Space (physical or digital)
Library measurement	How the library service was measured	Usage; Attendance
User measurement – Qualitative	How the user data were collected via qualitative methods. Interviews include individual and group interviews. Can choose up to 2. Reference interviews are considered content analysis.**	Interviews; Surveys; Other
User measurement – Quantitative	How the user data were collected via quantitative methods. Interviews include individual and group interviews. Can choose up to 2.	GPA; Persistence; Pre-/post-test; Retention; Survey; Rubric; Other
User measurement – Student type	Status of participants. Can choose up to 2. Other includes faculty/staff.	Undergraduate; Graduate; Other
Analysis method – Qualitative	How the data were analyzed via qualitative methods. Can choose up to 2.	Content analysis; Other
Analysis method – Quantitative	How the data were analyzed via quantitative methods. Can choose up to 3.	ANOVA; Regression; X2; Descriptive statistics; Correlation; Other

*Additional other categories may be added in the notes section of the study, and separated by pipes (The straight line that you get when you hit Shift + \). Example: If there were more than 2 outcomes, code Enrollment and Other, and in the notes write “Other outcomes are Graduation|Learning|Student engagement”

**Note: When the researchers use a rubric to evaluate student work, the analysis method is considered only quantitative if they only discuss the numerical values assigned to student work. If they report qualitative findings (e.g., themes) from the student work, then the qualitative analysis method may also be used (e.g., content analysis).

Using a Social Network Analysis to Inform Library Communication Patterns within the Harold B. Lee Library

Holt Zaugg, Quincey McKeen, and Greg Reeve
Brigham Young University, USA

Abstract

This study examined the communication networks among all full- and part-time non-student library employees based on self-identified employee interactions, including all face-to-face (e.g., meetings and training) and technology-based communications (e.g., e-mail, phone calls, and social media). Using a self-report survey, all employees identified the level of communication intensity between themselves and all other employees. The survey was completed over a three-week period with three reminders to non-responders.

Using six levels of communication, findings identified overall communication patterns within the library by examining interactions at the divisional and departmental levels. While communication was generally strong, there were areas where communication was not occurring. Specifically, smaller, co-located units communicated better than larger divisions or departments that were separated. There was also evidence of a "silo" effect, where division and department employees communicated well among themselves but not as well with employees from other divisions and departments.

Social networks are used by many organizations, ranging from schools to businesses, to better understand how people within the organization communicate and interact with one another.[1] The communication patterns help inform people how they are connected to one another and how these networks facilitate the flow of information, enhancing innovation and productivity.[2] The communication patterns often provide insights on how easily information may flow within an organization.

Bavelas described four classical patterns of information flow.[3] These patterns included a linear flow (i.e., A to B to C to D), where employees must communicate through adjacent coworkers in a linear fashion. Two similar patterns were hierarchal, where access to other employees or access to a leader is controlled by a single individual. These patterns are often referred to as bottlenecks. In the final pattern, all group members have unfettered access to each other, creating more open communication and information sharing.

Blau and Alba, in a study on communication patterns at a psychiatric facility for children, determined that the complexity of an organization might be a major cause of impeded interactions among participants.[4] Decision-making power increased as workers interacted with patients, each other, and those outside the unit. Communications with those outside of workers' immediate circles increased the workers' decision-making ability.

Moolenaar suggested using multiple analysis levels to determine communication-pattern efficacy among individuals in a school setting.[5] She indicated that multiple levels are rarely undertaken because of limiting factors such as individuals' communication preferences, individuals' biases, and the schools' communication characteristics. In spite of a study's complexity, the benefits can be rewarding as communication patterns are examined on multiple levels. Hanneman and Riddle support examining the connectedness of individuals.[6] The analysis of communication connectedness at each level enables better understanding of the expertise and experience of all employees to create innovative solutions or to prevent problems.

This study examines the communication patterns in the Harold B. Lee Library (Lee Library) at Brigham Young University. It seeks to understand communication patterns among full-time and part-time non-student library employees at the divisional and departmental level, and between library divisions using a model that allows librarians to identify the level of intensity of all forms of communication.

Library Description

The Lee Library serves approximately 33,000 patrons (faculty, undergraduate students, and graduate students). The library has approximately 170 full-time and part-time non-student library employees who are divided into six divisions: administration, administrative services, library information technology (LIT), public services, special collections, and technical services. Each division is further divided into departments or offices ranging from 2 to 30 employees. Each division is briefly described below.

Administration
Administration includes the university librarian, her administrative assistants in the Library Administration Office, and the staff comprising the Design, Marketing, and Communications Unit. Normally the associate university librarians (AULs) are listed as part of the LAO, but in this study each AUL is placed within his respective division. There are a total of eight employees in this division.

Administrative Services
This division consists of four independent offices that deal with a wide variety of library issues including the Business Office, HR and training, facilities, and assessment. There are a total of 10 employees in this division.

Library Information Technology (LIT)
LIT consists of four departments: operations, discovery systems, information systems, and web development. There are a total of 20 employees within this division who are responsible for all computer and web development functions within the library.

Public Services
Public services is the largest division with 52 employees spread across five departments or units that include social sciences, humanities, science and maps, learning commons, and access services. Employees in this division have the most face-to-face contact with library patrons.

Special Collections
Twenty-eight employees work in Special Collections in one of five areas: special collections, digital initiatives, conservation, university records management, and Education in Zion exhibits.

Technical Services
Technical services, the second largest division with 49 employees, is divided into two departments: cataloging and metadata and materials acquisition. They are responsible for acquiring library resources and cataloging and classifying library resources.

Method

The study used a self-reporting survey sent to all non-student library employees to indicate their level of interaction with other library employees. A pilot study, using the LIT division, was conducted to evaluate the survey's efficacy and to modify the survey. Following the pilot and subsequent revisions, the survey was sent to all library employees. All library employees had three weeks to complete the survey with three reminders sent to non-responders.

Identification and Intensity Levels
Participants were asked to identify themselves and indicate their communication intensity level with all other library employees. Letters were used to identify each communication level to prevent the implication of level hierarchy and to indicate that each level was intended to be mutually exclusive. The level descriptions are as follows:

> A = No contact (I do not communicate or interact with this person)

I communicate or interact:

> B = as needed (an immediate or short-term interaction)
>
> C = minimally (simple communication, monthly newsletter or announcement to inform)
>
> D = moderately (medium interaction)
>
> E = strongly (recurring important interaction)
>
> F = deeply (intense, complex communication)

The data complexity required several analyses, as suggested by Hanneman and Riddle[7] and Moolenaar.[8] First, the data was organized to create social communication webs for each division at each communication level. Geometric symbols identified library divisions, and colors identified departments. The first two letters of the first and last names of each employee identified individuals.

Second, tables were made for further analysis. For this part of the analysis, the concept of a communication unit (CU) was created. A CU is described as a single, one-way communication between two people regardless of communication modality or intensity level. A CU is unidirectional. For example, a communication from Joyce to Ted is a different communication than one from Ted to Joyce.

Analysis Categories

Using CUs, data was analyzed using categories suggested by Haythornthwaite but categories were modified for this study.[9] Categories are defined as follows:

- **Cohesion**. The amount and type of relationships among division employees at various communication levels within each division and, where appropriate, within each department in the respective division.
- **Structural Equivalence**. The percent of identical and different CUs within each division and between other divisions.
- **Prominence**. The percent of total possible pathways available in each division.
- **Obscurity**. The percent of employees in each division indicating the no-contact communication level with other employees.
- **Brokerage**. The most common communication level used within each division and between other divisions.

This evaluation primarily focuses on the communication patterns at the divisional and departmental levels, but there is the opportunity for individuals to examine their own communication patterns with other employees.

Findings

Only two of the library divisions reached the target participation threshold of 80%, as suggested by Moolenaar to be able to determine reliable patterns from the data (see Table 1).[10] However, three other divisions were within 7% of the target response rate. Those divisions that approached the threshold were considered sufficient to provide insights. All communication pattern analyses only include employees who chose to participate in the study. Disaggregation at the department level is not done for administration and administrative services because of the small number of employees. Some departments or units were not included because of poor response rate or job diversity. The analyses of divisions and departments with less than the 80% threshold should be considered with measured caution.

Table 1: Survey Response Rate by Division

Division	Total Employees	Number of Participants	Participation Rate
Administration	8	6	75%
Administrative Services	10	9	90%
LIT	20	17	85%
Public Services	52	38	73%
Special Collections	28	18	64%
Technical Services	49	37	76%
Total	167	125	75%

Communication Categories

The Lee Library's communication networks will be discussed in terms of the categories previously described.

Cohesion

Cohesion examines the amount (expressed as a percent) and type of communication at all levels within each division (see Table 2). Two divisions had a high rate of communication interaction (greater than 90%), three had a moderate level (between 80% and 90%), and one had a low level (less than 80%). While total communication within divisions was relatively strong, it is noteworthy that five of the six divisions' primary communication level was at the "moderate" or "as needed" levels. LIT used a variety of communication levels at nearly the same rate (deep = 24%, moderate = 23%, and as needed = 21%).

Table 2: Total Percent of CUs Within Each Library Division by Each Level of Communication

		Percent of Communication				
Division	Total	Deep	Strong	Moderate	Minimal	As Needed
Administration	88	17	12	14	14	**31**
Administrative Services	97	22	16	**32**	11	16
LIT	94	**24**	15	23	11	21
Public Services	77	6	9	13	17	**32**
Special Collections	82	5	16	**29**	13	19
Technical Services	69	6	7	14	12	**30**

Note. Boldface text indicates communication level with the highest percent of CUs.

Table 3: Total Percent of CUs within Each Library Department by Each Level of Communication

Division	Department	Deep	Strong	Moderate	Minimal	As Needed	No Contact
LIT	Operations	78	11	11	0	0	0
	Discovery	67	22	11	0	0	0
	Information Systems	89	11	0	0	0	0
	Web Development	86	7	7	0	0	0
Public Services	Social Sciences	18	13	24	20	22	2
	Humanities	42	35	23	0	0	0
	Science and Maps	23	34	34	0	9	0
	Learning Commons	21	22	27	16	13	2
	Access Services	57	21	20	2	0	0
Special Collections	Special Collections	4	29	32	16	11	7
	Digital Initiatives	-	-	-	-	-	-
Technical Services	Cataloging & Metadata	4	9	20	18	33	16
	Materials Acquisition	23	10	13	4	27	24

Note. Administration and Administrative Services were not included in the department level analysis because of the lack of employees in subdivisions.

Cohesion within each department highlights additional communication patterns (see Table 3). Two departments indicated strong communication patterns. In LIT, no department CUs were found in the minimal, as needed, or no contact levels. Two departments exceeded 80% of their CUs at the deep level with a third approaching 80%. Public services demonstrated a similar pattern with three of the five departments. The other two departments spread CUs throughout the various levels with only 2% in the no contact level. The special collections

department reinforced the pattern of mostly no-contact CUs found in the divisional level.

Structural Equivalence

CUs are a unidirectional measure identifying outgoing and incoming communications at all levels (see Table 4). Structural equivalence identifies if the directionality of the communications is happening to the same degree. For example, Joyce may consider her communications with Ted at an as needed level, but Ted may consider his communications with Joyce at a moderate level. While bi-directional communication at the same level is desired, it does not need to occur because the importance of the information being communicated may differ for the two employees.

Ideally the structural equivalence would approach 100%, but realistically this goal will not occur. For example, one employee may send out a monthly newsletter to inform other librarians, but some librarians who receive the message do not respond. If this newsletter is the only communication between these employees, there would be an expected intensity level difference. This was the case with employees in the administration and administrative services divisions, where four of eight employees and three of ten employees respectively sent out regular newsletters to all library employees. In other examples, the differences in communication levels may reflect the importance of the information to the employees. For one employee the information is critical to completing her or his job, while for the other employee the information being sent is not critical.

Table 4: The Percent of Identical and Different Communication Levels within and between Library Divisions

		Admin	Admin Serv	LIT	PS	SC	TS
Admin	Identical	**40**	30	36	29	29	45
	Different	**60**	70	64	71	71	55
Admin Serv	Identical	28	**40**	31	29	43	36
	Different	72	**60**	69	71	57	64
LIT	Identical	36	31	**39**	51	46	61*
	Different	64	69	**61**	49	54	38*
PS	Identical	29	29	51*	**40***	54*	52*
	Different	71	70	49*	**59***	46*	48*
SC	Identical	21	32	47	54*	**49**	63*
	Different	79	68	53	46*	**51**	37*
TS	Identical	45	31	58*	47	58*	**45**
	Different	55	69	42*	53	42*	**55**

Note. Boldface indicates within division interactions. Asterisks indicate more identical than different communication levels. Table should be read from division in column to division in top row. Admin = Administration, Admin Serv = Administrative Services, LIT = Library Information Technology, PS = Public Services, SC = Special Collections, TS = Technical Services.

An individual's evaluation of outgoing and incoming communications determines if there is a justified reason for the difference (e.g., information newsletters) or if the levels of communication between individuals need to be adjusted. A modified

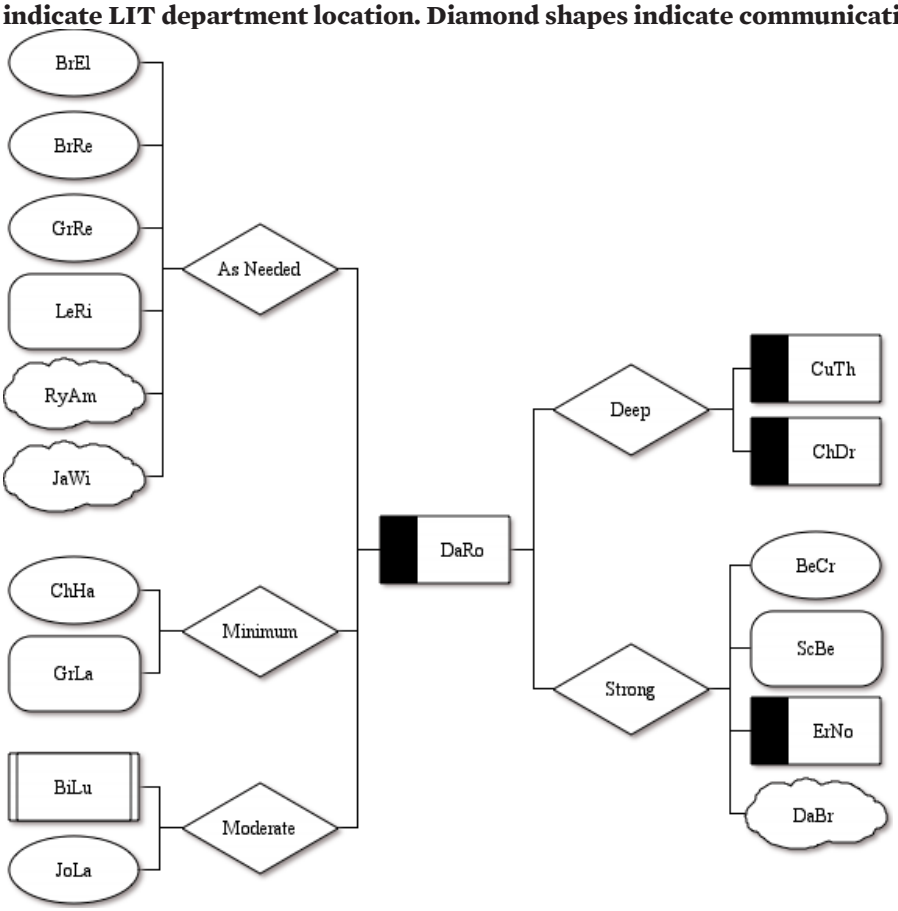
sample of one individual's (Z) structural equivalence is shown in Table 5. The individual's communication patterns may also be turned into an individual's communication genealogy (see Figure 1). The genealogy allows an individual to determine if the level of communication he or she has with other employees is at an appropriate level to his or her job requirements.

Table 5: A Modified Sample of Individuals' Structural Equivalences with Other Employees

Library Employee	Z To Others	Z From Others
A	Strong	Deep
B	Deep	Deep
C	As Needed	Moderate
D	Minimal	No Contact
E	Moderate	Moderate
F	Minimal	Minimal
G	Minimal	No Contact
H	Moderate	Strong
I	Minimal	As Needed
J	Moderate	Deep
K	Minimal	As Needed
L	Minimal	Moderate

Note. Letters are used to represent employees' names.

Figure 1. Communication genealogy for DaRo with others within the division. Different shapes indicate LIT department location. Diamond shapes indicate communication intensity level.



Prominence

In a communication network there are multiple ways to get a message from person A to person B. Obviously, direct communication would be best, but, if direct communication is not possible, a third person may be used. Prominence examines the number of communication pathways between people in an organization. Obviously, the larger an organization is, the more potential pathways are available. While it is not expected that any employee would use every possible pathway, having a line of communication available ensures that the communication gets through to other employees. Prominence highlights how many of the potential pathways are available to be used, expressed as a percent of total possible pathways (see Table 6). It is a measure of the potential for information to flow within each division.

As in other areas, administration, administrative services, and LIT had the highest percent of potential pathways available for use. The other three divisions had less than 70% of their pathways available, which still has the potential for good information flow. As with other analyses, a division is not expected to have 100% of pathways available; however, more available pathways indicate the potential for better information flow. It is noteworthy that the smaller-sized divisions have the highest rates of available pathways.

Table 6: The Percent of Potential Pathways Available for Use within a Division

Division	Percent Available
Administration	81
Administrative Services	100
LIT	91

Division	Percent Available
Public Services	59
Special Collections	69
Technical Services	48

Obscurity

Obscurity hinders communication because pathways are limited or not present. In extreme cases, employees are isolated with no communication lines to others or they only connect through a single person. An employee with only one or two connections to others risks being completely isolated from the rest of the organization should something happen to his or her link (see Table 7).

There were few obscure CUs (no contact) in most departments. In most cases, obscure CUs may be traced back to an individual who, for whatever reason, does not communicate with multiple people in the division. For example, the 12% obscurity level shown in administration was attributed to a single person who does not communicate with several others. Similar examples happen in other divisions.

The technical services division had a higher rate of obscurity within both departments. Closer examination indicates that most of these no-contact CUs occur between employees who worked on separate floors (Floor 2 versus Floor 6). Similar patterns in other divisions mirror these findings. For example, comparing the percent of no-contact CUs within each department of the public services division and the other public services departments located on different floors accounted for 15% to 56% of all no-contact CUs in each department (see Table 8). In administration, the person to whom the no-contact CUs were attributed worked in an area separate from others. LIT employees were situated on the same floor but in separate areas. Two-thirds of all no-contact CUs in the LIT division occurred between employees working in these separate areas. In special collections, 84% of all no-contact CUs were attributed to employees located on different floors (one employee was located in another building). While there may be other reasons for the no-contact CUs between employees situated apart from one another, distance does account for a considerable number of no-contact CUs.

Table 7: The Percent of No-Contact CUs within Each Division and within Each Department

Division	Department	Percent
Administration		12
Administrative Services		0
LIT		6
	Operations	0
	Discovery	0
	Information Systems	0
	Web Development	0
Public Services		24
	Social Sciences	2
	Humanities	0
	Science and Maps	0
	Learning Commons	2
	Access Services	0
Special Collections		19
	Special Collections	6
	Digital Initiatives	-

Division	Department	Percent
	All Other	30
Technical Services		32
	Cataloging & Metadata	13
	Materials Acquisition	24

Table 8: The Percent of No-Contact CUs on Each Floor Out of All No-Contact CUs for Public Services Employees

Floor	Percent
1	35%
2	52%
3	56%
4	21%
5	15%

Brokerage

Brokerage is the level of communication used most within a division and between one division and its counterparts (see Table 9). Considering all CUs to and from each employee, the most common level used in the library is no contact. Exceptions occur in administration, where communication is at the as needed level with all other divisions except for administrative services, where communication is moderate. LIT communicates with administrative services at the as needed level, and, in communication between administration and administrative services, the no contact and minimal levels are used equally.

Also of interest is the amount of no-contact CUs between several divisions. In 14 instances, the amount of no-contact CUs between two given divisions was at or exceeded 50%. In two specific instances, the number of CUs in the no contact level exceeded 70%.

Table 9: The Most Common Communication Levels within and between Divisions

	Admin	Admin Serv	LIT	PS	SC	TS
Admin	**As Needed**	Moderate	As Needed	As Needed	As Needed	As Needed
Admin Serv	No Contact & Minimal	**Moderate**	No Contact	No Contact	No Contact	No Contact
LIT	No Contact	As Needed	**Deep**	*No Contact	*No Contact	*No Contact
PS	No Contact	No Contact	*No Contact	**As Needed**	*No Contact	*No Contact
SC	*No Contact	No Contact	*No Contact	*No Contact	**Moderate**	*No Contact
TS	*No Contact	No Contact	*No Contact	*No Contact	*No Contact	**No Contact**

Note. Communications include all CUs to and from employees. Boldface indicates communication level within divisions. Asterisks indicate 50% or more CUs. Table should be read from division in column to division in top row. Admin = Administration, Admin Serv = Administrative Services, LIT = Library

Information Technology, PS = Public Services, SC = Special Collections, TS = Technical Services. * = 50% or more CUs

Limitations

This study had several limiting factors. First, as previously mentioned, the low response rate in some divisions hindered the efficacy of interpreting communication patterns. Ideally, 100% of employees would have participated. Second, this analysis was a single view of library communications at a specific time. Communication patterns may change as newer employees become more integrated into the library, older employees leave, or assignments within the library change. Third, the study's communications time frame could affect the patterns. For example, this study asked employees to consider communications over the past year. However, if the reference time was changed to a semester or a month, communication patterns could alter significantly. Fourth, the communication modality may alter results. If only a single communication modality was examined (e.g., e-mails), the results may differ from these results. Finally, this study relied on employees' memories and perceptions of communication interactions. Memories are not always accurate. Bernard, Killworth, Kronenfeld, and Sailer report that less than half of individuals accurately reported their communications as measured on either amount or frequency.[11] We suspect similar results occurred in our study as several individuals contacted us asking to add to their information as they recalled interactions after completing the survey. Additional evaluation of communication patterns indicated that the no contact level might have been inflated as some of the employees reviewing their profile identified instances where no contact was indicated but should not have been.

Discussion

The communication patterns in the Lee Library are strong and healthy, but there are areas that can be improved. While further study is needed to determine if patterns found in the Lee Library occur elsewhere, several communication patterns are evident.

First, there was better communication among employees in smaller units. This pattern was illustrated by more employees interacting at levels of greater intensity in smaller divisions or in departments within divisions. Second, communication among employees in different divisions and departments had a greater prevalence of the no contact level. Third, co-located employees had better communication. Again, the amount of interaction at the no contact level was higher with employees who were not on the same floor or in the same location on the same floor.

Fourth, smaller divisions had greater communication-pathway potential. While there was greater potential, the question needs to be addressed of just how many pathways are needed to facilitate communication. While the larger divisions had a lower percent of pathways available, in some cases, they had more pathways. While this pattern may exist within a specific communication level, it often does not hold true when considering multiple levels of communication. In these instances, individuals should examine their specific communication patterns and determine if the levels of communication between themselves and others are appropriate.

Finally, brokerage measures indicate a silo effect when examining the most common communication pattern used between divisions. Large numbers of employees were not communicating with employees outside of their divisions and/or departments. Whether this is the result of an underlying communication issue, of widely differing job responsibilities, or of some other factor would need to be further examined.

Conclusion

Overall, communication patterns within the Lee Library are strong, but specific areas need further examination. Evidence of siloed divisions was present but was mitigated in smaller sized and co-located divisions and departments. To improve communication, individuals may examine their own communication patterns to determine if adjustments should be made. Improving the communication patterns in the library will improve the flow of communication. Positive results could provide innovative solutions to emerging problems and prevent issues from arising.

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So, You Developed the Framework for Liaison Work. What's Next?

Yelena Luckert
University of Maryland, USA

Abstract

This paper will discuss the implementation of an assessment program for subject specialist liaison librarians at the University of Maryland. The framework for the subject specialist liaison librarianship at the University of Maryland was put in place in 2014. The year 2015 was the first full annual review cycle under the new guidelines. The assessment program includes procedures for assessing the liaisons' research services, collection development activities, teaching and learning services, scholarly communications, and outreach and engagement activities. This paper will discuss practical steps towards implementation, outcomes, challenges, and successes of the new program.

Introduction

In 2012, faced with changes in the environment and roles of public librarians, the associate dean for public services at the University of Maryland (UMD) Libraries convened a Liaison Services Task Force (LSTF) comprised of several faculty librarians in the public services division. The task force was tasked with developing a framework for subject liaison librarianship at the UMD Libraries based on internal examinations, conversations with colleagues at other institutions, and an extensive literature review. The LSTF worked from October 2012 through June 2013. The deliverable was the *Liaison Librarian Task Force 2012–2013, The University of Maryland Libraries, Final Report*,[1] which defined subject liaison librarianship at the UMD.

The LSTF report identified five core areas of liaison responsibilities (collection, reference, instruction, outreach, and scholarly communication/data research), and identified best practices for each of these areas. The report also provided several key recommendations: (1) the creation of CORE competencies for liaison librarians, both subject competencies and soft skills; (2) the creation of assessment methods to evaluate the work of individual liaison librarians (versus liaison program); (3) a marketing and promotional plan to advertise liaison work on campus and within the libraries; and (4) a training program to further develop the skills and competencies of liaisons.

The report was widely and extensively circulated and discussed with all subject librarians, in their units and across the division. The entire library staff expressed great interest in the report and its implementation. It was circulated even to the university administration where it was very well received. In effect the report became the framework for liaison librarianship at UMD.

Once the report was completed, attention turned to implementation. Implementation for us translated into changes in the way we defined ourselves, viewed our work priorities and core responsibilities, and collaborated. To facilitate this change, the public services division was reorganized to have all subject librarians in the same department, now called research and learning. All our subject librarians are still divided into smaller administrative units based on function, location, or branch. The research and learning is led by the director of research and learning assisted by a management group, R&L heads, comprised of all managers in the department who are either heads of branches or functions. Since all subject librarians are in a single department, it provides for better administrative oversight and facilitates unity, cooperation, coordination, and commonalities across locations and purposes. The research and learning department also went through unifying exercises to define our common mission, vision, and goals, as well as strategic priorities, which are periodically under review.

All of LSTF recommendations were important. However, we chose to start with the development of the framework for annual reports for librarians, believing that going through such exercise on an annual basis will help all of our public services librarians ease into their new roles as liaisons. We aimed to achieve full participation in the process of implementing the new system by creating multiple opportunities for people to speak, make suggestions,

and voice opinions in private and in public forums. The new guidelines went through multiple approval levels so everyone had a chance to speak up and make adjustments.

Since the libraries had a very strong prior culture of annual, merit, and tenure reviews, and to avoid confusion, we layered the new annual assessment processes over already existing ones, but focusing it on the framework developed by the LSTF report. We also created written documents to be used by librarians and supervisors alike, composed of guidelines, examples, and templates.[2] These documents are easily accessible to our staff since they are placed on the internal libraries website and are updated as needed.

The annual report for liaison librarians is divided into three main categories: librarianship, service, and scholarship/creativity. This strictly follows our library faculty guidelines for promotion and permanent status review, which makes it easier for people to build their dossiers for promotion when the time comes. In fact, our non-permanent status librarians were the leading catalyst for developing this process. They wanted clearly stated annual review procedures that can help them grow both professionally and within the organization. They are still some of the biggest proponents of the current review.

For the purpose of this paper, we will concentrate on the category of librarianship. This category as pertaining to our subject librarians is broken into five areas as prescribed in the LSTF report: collections, instruction, reference, outreach, and scholarly communication/data research. We combined scholarly communication and data research into one category for the time being since we felt that activities in those areas are still relatively low and uneven in comparison to other areas.

Easing it in

We staggered implementation. In the first year (2014), we asked liaisons to demonstrate activities in at least three out of five categories of liaison activities identified by the report, to ease folks into the process. In the next annual cycle (2015), we changed that to full compliance, as we moved further in the implementation stages. After living with the new system for the first year we also came to the realization that we did not have a common understanding of what our expectations should be, i.e., what set of skills was appropriate for our work across all disciplines and locations. For example, what are subject librarians' responsibilities towards bibliographic management software: does each one of us offer services related to this and at what level? On this issue alone we had opinions ranging all along the spectrum. Thus, in order to have a meaningful assessment, we had to arrive at a common understanding of our CORE competencies, both subject- and skills-based, which incidentally was another of the LSTF report's recommendations.

In late 2014, we developed *CORE Competencies for Subject Specialist Liaison Librarians, Research Services, Public Services Division, University of Maryland Libraries*,[3] both subject- and skill-based, which we are using now as the baseline for all subject librarians, regardless of discipline or location. As with all other big decisions, this was truly a communal effort, which went through an array of public and private discussions and various levels of approval. These CORE competencies became effective on January 1, 2015. They are designed to be a self-motivating developmental tool for liaison librarians, guide their individual work, and provide a training framework based on individual needs, especially for new hires. As our annual review cycle is calendar-based, we implemented the newly defined CORE competencies just in time for the 2015 annual review cycle.

What assessment means to us

From the start, we viewed liaison annual assessment as a developmental tool for individuals, where the conversation between librarian and supervisor is an integral part of good performance. The purpose and goals of assessment are aimed at fostering the individual's professional growth, not punitive outcomes. The assessment is a measurable indicator of an individual's engagement with his or her work, particularly in relationship to the faculty and departments we serve. It is a series of benchmarking on the part of an individual that show support for institutional goals. These goals are intimately connected to the unit, departmental, and the libraries' strategic goals, as well as the promotion and tenure review policies and procedures as shown above.

We want our assessment to be meaningful, manageable, sustainable, actionable, and motivational. The main focus of evaluation is to encourage liaisons to demonstrate the impact of

their activities and why they are important. For example, it is wonderful if someone taught fifty subject classes a year, but what was the impact of such effort? What did students learn? Did the librarian do anything differently from one session to another? Was this effort worth the work that went into it? Prior to this we just did not consider those issues. Our librarians can demonstrate the impact of their activities in a variety of different ways, including assessments, statistical data, speaking or publication opportunities, and kudos or comments from faculty, students, and/or colleagues. None of these measures are draconian in our view, and folks have quite a bit of freedom in deciding on what, when, and how to use as evidence to substantiate their points.

Since individual growth is an important part of our assessment, it is important to acknowledge failure as a part of growth. Success does not come right away; it comes through trial and error and personal reflection on those efforts. To develop new ideas takes a lot of time, energy, and courage. Thus it is important to allow people room to experiment and to give them credit for their efforts, successful or not, as long as they are within institutional goals. Another important part of the assessment is for supervisors to help individuals identify areas where improvements might be needed and to help identify possible training to remedy deficiencies. And of course we want to highlight and celebrate individuals' achievements and hard work, both privately and publically. To that end we have a regular kudos column and a regular newsletter that highlights achievements on our subject librarian's website, http://www.lib.umd.edu/rc/meet-your-librarian.

Results

With all the right elements in place, 2015 became our first year of full-fledged liaison assessment. The criteria for liaison work and CORE competencies allowed supervisors of liaison librarians to evaluate performance in a more meaningful way, celebrate achievements, identify areas of improvement, and recommend appropriate training if needed. Based on these assessments we have identified several weaker skills, some across the board and some in certain individuals, which we are in the process of addressing through training, internal and external, for both individuals and groups. In some cases, we modified assignments to better fit individual strength and organizational needs.

We believe that we have been able to better help our librarians who do not have permanent status yet in building up their dossier, and making them more comfortable in the process. We have also noticed an increase in productivity and a higher rate of merit awards for 2015 (all merit is reviewed by a Faculty Merit Committee independent of supervisors). Overall the first two years of implementation went well and we have learned a lot about our work and performance. We still are getting comfortable with this tool, and it will take some time to reach its full potential.

We deeply understand that any assessment program of liaison librarians, including ours, is a perpetual work in progress. It has to be able to shift with the changes in our environment, strategic priorities, and overall growth. It will be important to regularly assess and adjust the process as circumstances dictate. Consequently, we believe that in its totality our assessment of liaisons shows the libraries' impact on the strategic goals of the university. In all, assessment becomes a reflection of the individual and the organization.

Yelena Luckert, Director for Research and Learning, University of Maryland Libraries, yluckert@umd.edu

Endnotes

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2. Y. Luckert, *Guidelines and Forms for Annual Reporting of Subject Specialist Liaison Librarians, Research Services, Public Services Division, University of Maryland Libraries* (College Park, MD: University of Maryland Libraries, 2015), http://drum.lib.umd.edu/handle/1903/18056.

3. Y. Luckert, *CORE Competencies for Subject Specialist Liaison Librarians, Research Services Public Services Division, University of Maryland Libraries* (College Park, MD: University of Maryland Libraries, 2015), http://hdl.handle.net/1903/17457.

Reskilling for the Digital Humanities: Assessing Outcomes of a Developing-Librarian Program

Nisa Bakkalbasi, Barbara Rockenbach, and John Tofanelli
Columbia University in the City of New York, USA

Introduction

In the fall of 2012 the Humanities and History Division of Columbia Libraries initiated a three-year training program for enhancing the skill sets of liaison librarians. The aim was to have these skill sets more closely align with the evolving research and digital needs of humanities researchers. This training program, called "The Developing Librarian Project (DLP),"[1] was created by and for the librarians and other professional staff within that division.

Two aspects were crucial for the program from the beginning. First, that it would be project based and team based, with the librarians of the division designing and creating a digital humanities resource together. The program is based on the assumption that learning must happen in context, a model the DLP team borrowed from the Praxis Program;[2] therefore the training is project-based, with all participants engaged in creating a digital humanities research project as a team. Second, that elements of assessment would be incorporated into the project from the beginning and assist the team to learn both from the project's successes and failures.

The digital resource that the DLP team chose to create was the website *Morningside Heights Digital History,*[3] which was publicly launched in fall 2015, bringing to conclusion the first phase of the project. This resource provides a coordinated collection of digital exhibits concerning the history of the neighborhood in which Columbia University is situated.

The process was as important as the end product. Each librarian in the humanities and history division chose a building or institution about which he or she did research and constructed a digital exhibit. In addition to individual research and exhibit authoring, each librarian was a member of a team that specialized in certain issues relating to the development of the site: for example, there was a project management team and a design team. Each member of the team was responsible not only for his or her own piece of the puzzle, but for working together with, listening to, and mentoring others to make sure that the puzzle as a whole came together. The objective was not so much the end-product itself but the skills and the forms of engagement that were fostered by the team-based approach to creating the site.

The following are the essential objectives of the two-year training program:

1. to assist librarians in learning tools and methods that support the emerging research needs and trends in the humanities;
2. to create a more interesting and engaging work environment for liaison librarians and other professional staff; and
3. ultimately, to provide librarians with a basis for engaging more effectively with the humanities research community across the university.

In "Re-skilling for the Digital Humanities: Measuring Skills, Engagement, and Learning," Bakkalbasi, Jaggars, and Rockenbach describe the training program and the assessment design in detail, and present assessment results at project midpoint. The focus of the present short paper is on the final assessment instrument, a Skill Set and Knowledge review, that was first administered in the summer of 2015, just before the public launch of the *Morningside Heights Digital History* website. For the remainder of this paper, we will describe that instrument and how its results will be utilized as we move forward into the 2.0 phase of the Developing Librarian Program.

Methodology

The Skill Set and Knowledge assessment instrument (see Appendix A) includes peer and self-assessment by allowing librarians to score themselves in each competency area and validate their scores by discussing them with a peer rater. In "The Place of Peers in Learning and Assessment," Falchikov argues that peer involvement in assessment has the

power to aid learning. Based on this premise, the instrument is designed to utilize peer assessment to allow librarians to make reasonable judgments about the extent to which their peers have achieved expected outcomes of the training program.

The skills that were listed for assessment were either drawn from relevant published literature or formulated based on the learning objectives of the three-year training program. For example, the second item under Behaviors and Attitudes, "Ability to gain an appreciation of individual research/project needs, including effective listening skills," was drawn from a list of desirable skills for subject librarians enumerated in the 2012 report *Reskilling for Research* from Research Libraries UK.

The administration of the Skill Sets and Knowledge instrument involved multiple steps. The first step that each librarian was asked to take was to fill out the self-assessment sheet. Each librarian was asked to assess herself or himself in the skills and knowledge competencies, in the top box of the sheet, and in the behaviors and attitudes, in the bottom box of the page. A four-point rating scale was used in which:

> 1 = Beginning, 2 = Developing, 3 = Good, and 4 = Advanced

At the same time as each librarian was presented with a self-assessment sheet, he or she was also provided with a peer reviewer sheet with the name of a colleague whom he or she would need to rank in all of these categories. The librarians were given a six-week timeframe in which to do their own self-ranking and to conduct two peer review meetings. In one meeting, they would meet with the peer they had been assigned to review and discuss how they had ranked that peer and how that peer had ranked themselves. In the other, they would meet with the peer who had been assigned to review them and discuss how that peer had ranked them in light of how they had ranked themselves.

During that same six-week time period the director of the history and humanities division was provided with her own sheet, in which she needed to indicate for each individual whether the skill was essential or desirable for the effective performance of each librarian's role to support humanities researchers in an evolving information environment. Thus, for each librarian for each item, there were three coordinates: two numerical rankings, one from self and one from peer, and a category choice of "essential" or "desirable."

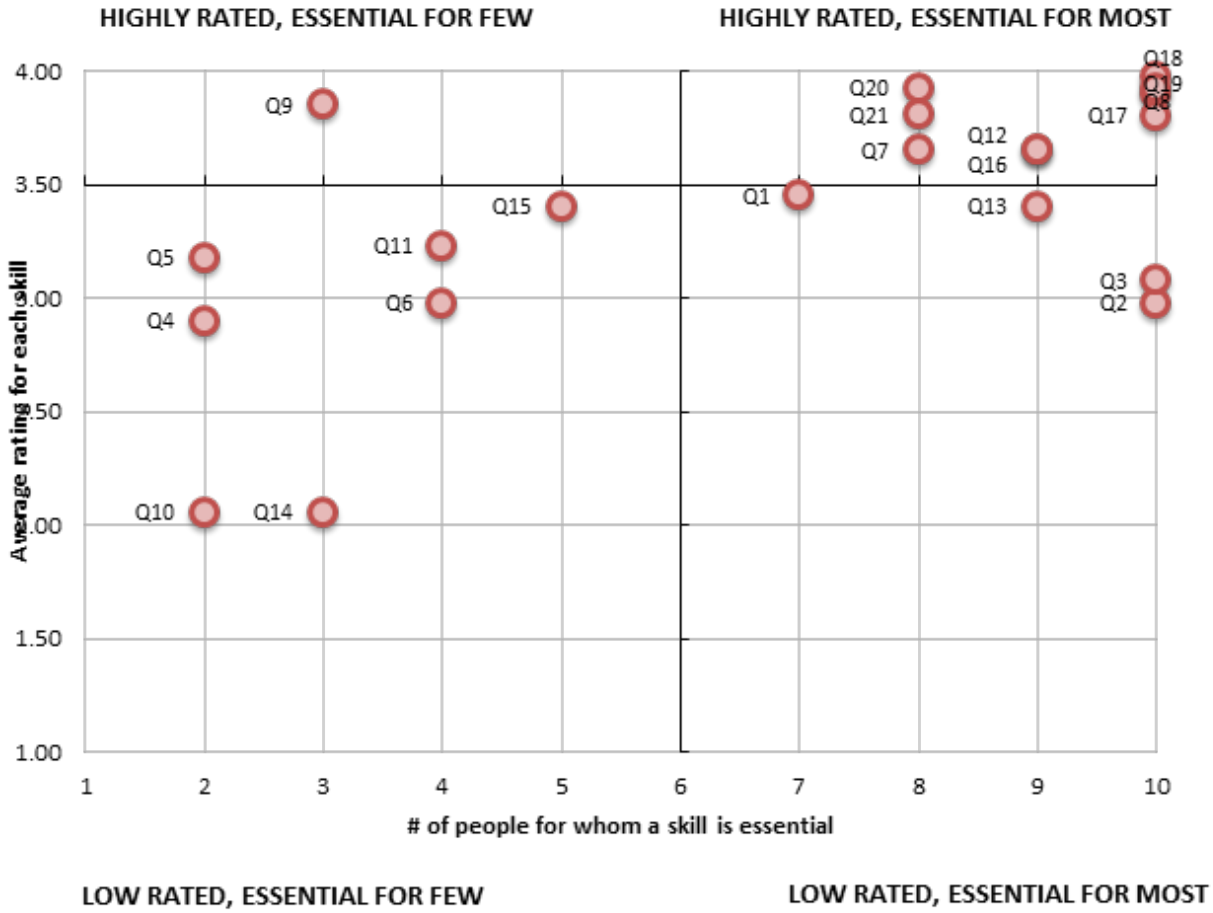
Findings

These response sheets were all returned to the assessment coordinator who collated them to create three documents:

1. A response sheet for each individual librarian showing all three coordinates for each item
2. A summary response sheet collating responses for all 10 librarians in the division and averaging together the self-assessment and the peer ranking into a single number (Table 1)
3. A distribution chart that enables us to visualize the relationship between the coordinates listed on the summary response sheet (Figure 1)

In Figure 1, the "Average Rating for Each Skill" is marked on a vertical 1 to 4 scale and the "Number of People for Whom a Skill is Essential" is marked on a horizontal 1 to 10 scale.

Figure 1, Distribution of Skillset and Knowledge Responses



The placement of items on the chart allows us to make distinctions regarding relative importance. The areas most deserving of immediate attention are skills that are essential for most or for all librarians in the department. Thus items situated along the horizontal gridline 10, which are essential for all librarians, merit special attention. For example, at horizontal gridline 10 and vertical line 3.08, we find Q3. This item concerns "Understanding authors' rights, copyright legislation, etc." The DLP team will need to decide whether a ranking of 3.08 or "good" (as opposed to 4 or "advanced") is adequate for a skill essential for all. If it is not adequate, the director of the Humanities and History Division will need to work with the DLP team to determine how their understanding of these matters will be enhanced as the program continues. Furthermore, the assessment coordinator will be sharing with individual librarians the set of responses that were compiled about them.

Table 1: Summary of Skill Set and Knowledge Responses

#	Item	Essential for	Average rating
1	Scan and produce electronic text	7	3.45
2	Use of Citation Management Software to assemble a bibliography	10	2.98

#	Item	Essential for	Average rating
3	Understand author rights, copyright legislation, and intellectual property issues, and plagiarism, and to be able to advise or refer as appropriate	10	3.08
4	Articulate what a project charter is and why it is important in a digital project	2	2.90
5	Knowledge to advocate and advise on the use of metadata	2	3.18
6	Identify and assemble digital images using an image editing software	4	2.98
7	Skills in information discovery and literature searching in partnership with a project team to advance your own research and the team's	8	3.65
8	Knowledge of content (in all relevant media) available to my discipline/subject	10	3.90
9	Ability to connect the skills associated with requirements gathering to the reference consultation	3	3.85
10	Demonstrate an ability to set up a server on the internet	2	2.06
11	Ability to navigate platforms (Omeka & WordPress) and understand when to recommend the use of these tools	4	3.23
12	Identify special collections for use as sources for digital projects	9	3.65
13	Advise researchers on tools and methods for managing the research process	9	3.40
14	Understand Git and GitHub and the importance of using a repository for version control and collaborative projects	3	2.05
15	Understand the fundamentals and importance of project management	5	3.40
16	Awareness of current and changing local research interests	9	3.65
17	Ability to gain an appreciation of individual research/project needs, including effective listening skills	10	3.80
18	Ability to build strong relationships with researchers and other campus professionals and to establish collaborative partnerships externally, and to manage client relationships	10	3.98

#	Item	Essential for	Average rating
19	Ability to collaborate within department and with external partners	10	3.93
20	Propensity to share knowledge and ideas informally and formally with colleagues	8	3.93
21	Understanding of a typical researcher's experience, including their workflow, and how researchers access and use information, within a discipline/subject	8	3.81
	Overall Average Rating		**3.37**

Practical Implications

At the beginning of this short paper, we mentioned that phase one of DLP ended in fall 2015, with the completion of the *Morningside Heights Digital History* project site. But the program has not ended. The history and humanities division is now in a phase they are calling Developing Librarian 2.0, in which librarians hold regular meetings to share the results of individual research projects that include digital humanities aspects. In this 2.0 phase, they will be devoting time to the sharing and analysis of the results of the Skill Set and Knowledge assessment and using them to help determine where and how we proceed.

The Developing Librarian Project and assessment was based on the assumption that learning happens best when it is done as a team with support from peers. Peer-to-peer learning was crucial to this reskilling program and therefore peer assessment was a key component of the Skill Sets and Knowledge instrument. By taking responsibility for their colleagues' learning, the humanities and history librarians grew both as individuals and as a team.

Endnotes

1. For more information about the Developing Librarian training program, see The Developing Librarian Project at http://www.developinglibrarian.org/.

2. For more information about the Praxis Program at the Scholars Lab, see: http://praxis.scholarslab.org/.

3. Morningside Heights Digital History, https://mhdh.library.columbia.edu/.

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Appendix A: Skill Set and Knowledge Assessment Instrument

Your name:_____

Please rate yourself as follows for each item: 1 – Beginning; 2 – Developing; 3 – Good; 4 – Advanced

	Skills and knowledge competency areas	**Self-assess**	**Peer review**	**Essential/ Desirable**
1.	Scan and produce electronic text.			
2.	Use of Citation Management Software to assemble a bibliography.			
3.	Understand author rights, copyright legislation, and intellectual property issues, and plagiarism, and to be able to advise or refer as appropriate.			
4.	Articulate what a project charter is and why it is important in a digital project.			
5.	Knowledge to advocate, and advise on the use of metadata.			
6.	Identify and assemble digital images using an image editing software.			
7.	Skills in information discovery and literature searching in partnership with a project team to advance your own research and the team's.			
8.	Knowledge of content (in all relevant media) available to my discipline/subject.			
9.	Ability to connect the skills associated with requirements gathering to the reference consultation.			
10.	Demonstrate an ability to set up a server on the internet.			

	Skills and knowledge competency areas	**Self-assess**	**Peer review**	**Essential/ Desirable**
11.	Ability to navigate platforms (Omeka & WordPress) and understand when to recommend the use of these tools.			
12.	Identify special collections for use as sources for digital projects.			
13.	Advise researchers on tools and methods for managing the research process.			
14.	Understand Git and GitHub and the importance of using a repository for version control and collaborative projects.			
15.	Understand the fundamentals and importance of project management.			

	Behaviors and attitudes	**Self-assess**	**Peer review**	**Essential/Desirable**
1.	Awareness of current and changing local research interests.			
2.	Ability to gain an appreciation of individual research/project needs, including effective listening skills.			
3.	Ability to build strong relationships with researchers and other campus professionals and to establish collaborative partnerships externally, and to manage client relationships.			
4.	Ability to collaborate within department and with external partners.			
5.	Propensity to share knowledge and ideas informally and formally with colleagues.			

	Behaviors and attitudes	Self-assess	Peer review	Essential/Desirable
6.	Understanding of a typical researcher's experience, including their workflow, and how researchers access and use information, within a discipline/subject.			

Building Library-Wide Engagement in Assessment from Scratch

Beth Martin, Anne Cooper Moore, and Rachael Winterling
University of North Carolina at Charlotte, USA

Introduction

In the space of three years (2013–2016), the UNC Charlotte's J. Murrey Atkins Library has moved from a lack of understanding of the concept of assessment to applying an assessment lens to all library activities. The "we know what the students need" attitude permeated the library. Decisions were subjective rather than data driven and there was an absence of data gathering and analysis to inform decision making. The library had expertise in the form of a usability assistant and an ethnographer, but their work was predominantly campus/externally focused. Since the arrival of a new dean in the summer of 2015, assessment has become internalized into everything we do. Learning about and participating in assessment, usability, and ethnographic studies has helped faculty and staff embrace assessment. Now, we have a pervasive culture of asking what, why, and how. For example, why do students in Greek organizations sign a paper log when they come and go from the library? How can we accommodate students who need to bring their young children with them to the library when they study? What do veterans need from the library and what would help them study successfully? This paper will discuss how the J. Murrey Atkins Library is rapidly building a culture of assessment.

Past

Prior to 2013, the J. Murrey Atkins Library (Atkins) did not have a focus on assessment. Assessment activities were primarily directed outward—toward the campus and our sister schools. The library hired an ethnographer in 2009 who conducted research to rethink our space needs. As a result of her work, the ground floor was redesigned and four service points were consolidated into two. The ethnography project included observational research on students, but was not integrated into larger library strategic initiatives.

A few traditional library studies were performed. LibQUAL+® was conducted in 2003, but received little attention once the study was complete. The Measuring Information Services Outcomes (MISO) survey was performed in spring 2013, but the results were not analyzed immediately. Instruction assessment lacked coordination and integration with our strategic goals. The liaisons used the LibAnalytics tool to record consultations, but analysis was limited because of time constraints.

Data was gathered on an ad-hoc basis during accreditation, strategic planning, or budget cycles, and to respond to annual statistical surveys such as the Integrated Postsecondary Education Data System (IPEDS) and the Association of Southeastern Research Libraries (ASERL). Library departments and units maintained their own statistics and the library business manager compiled the data once a year and submitted the required reports. There was neither a centralized data gathering system in the library nor an operationalized plan to gather this data on a regular basis. The final reports were not shared with the library faculty and staff. The reports were not analyzed for trends that could inform budget requests or collection/service improvements.

While there were pockets of interest in assessing specific aspects of library services and support, assessment was not a priority. Assessment coordinator responsibilities were added to the job announcement for the head of access services to attract a specific candidate who was interested in assessment. The first assessment task assigned to the new head was to analyze the MISO data; however, the library as a whole showed little interest in the data beyond faculty satisfaction numbers. Since the assessment coordinator was responsible for circulation, reserves, collection maintenance, and interlibrary loan, she focused assessment efforts on these public services. For example, we expanded LibAnalytics to include our circulation service point to better understand what was asked at this desk and began analysis of ILL data to inform collection development processes. In addition, we strengthened the relationship between Access Services and Research and Instructional Services (RIS), which led to several collaborative studies such as mystery

shopping to enhance our customer service processes across all public service areas.

One of the librarians who worked in the Digital Scholarship Lab performed usability studies along with other technology functions in the library. In 2014 she brought in an intern to perform a comparative usability study on our discovery service and we were able to hire the intern full-time as a usability assistant. In addition to the discovery studies, the team tested the library website and the campus' online academic program and course approval system prior to the campus rollout.

The prevailing attitude toward assessment in the library was negative for several reasons. Both faculty and staff were skeptical that employees who did not have a library background could or should assess our services. A short-term administrative approach that charged library departments to use the services of the usability team exacerbated the disdain for assessment. Some team members felt that the library did not need anyone researching patron needs and that anecdotal evidence was sufficient to support major service initiatives. Some team members felt that the ethnography and usability employees were not supporting the library and as such were a drain on already tight resources throughout the organization. In addition, the word assessment had negative connotations as something that would be used punitively against employees in their performance evaluations.

In November 2013, these perceptions began to change with the addition of the head of access services and assessment coordinator (20% of her time) as well as the temporary housing of the Office of Assessment and Accreditation in the library. Positive, causal interactions between library staff and the pleasant staff of the Office of Assessment and Accreditation resulted in a more positive attitude toward assessment. The new usability assistant also began to have conversations with different library groups to explain what services she could offer. The assessment coordinator began to explore data visualization tools such as Tableau to help the library communicate its findings in new ways and began a data audit to determine where our data was stored, what should be kept, what should be centralized, and what we did not need to collect.

New Dean

A new dean arrived in June 2015 who was active in the assessment movement in ARL, in LLAMA, and in cocurricular and campus-wide assessment at her previous university. She was impressed with the dedicated assessment personnel (usability, anthropology, instruction, access services), but surprised that most of the assessment activities were conducted for other campus groups rather than focused on demonstrating library impact on students and their learning. While the staff dedicated to assessment functions were on the library budget and hired by and housed in the library, they worked exclusively on projects for other campus groups. The dean saw innovative technologies, services, collections, and facilities in the library, but limited research into their effectiveness, impact, and possible improvement. She could see that with planning, goals, structure, organization, participation, and coordination, the outstanding work taking place throughout the library could become recognized and valued across campus and lead to improved services and campus engagement.

Her first step was to volunteer the library to participate in campus-wide assessment efforts through the Academic Affairs Office of Assessment and Accreditation. She visited with the two leaders of the Office to explore how the library might get involved in campus efforts and to discuss our need to supplement existing metrics we gathered for traditional library reporting in order to demonstrate our impact on students. She attended several of the Office's professional development sessions to get an idea of the role and perception of assessment on campus. The Office proved to be an engaged ally. The library was added to the IRB approval for the National Survey of Student Engagement (NSSE) and obtained the full dataset to run comparison reports.

The next step was to add assessment to the strategic plan. The provost asked the new dean to engage the library in developing a strategic plan in the first six months she was on the job. This was a tall order, but the faculty and staff came together in several retreats to revise the mission and vision and create a list of values statements. A strategic planning committee was appointed to develop a plan that followed the new academic plan from academic affairs. We added "integrate assessment practices across the Library" to Goal 1 ("Educate a diverse student body through an integrated academic experience that positions graduates for personal success and civic responsibility in the global environment of

the 21st century") of the academic plan. Assessment permeated our own strategic plan as well.

The dean thought it was important to begin a new era of assessment in the library with a quick standardized assessment to serve as a conversation starter, so we conducted LibQUAL Lite in fall 2015. This was the first project of the Assessment Committee under the leadership of our head of access services who would soon become our head of assessment. LibQUAL was last administered in the library in 2003. While the results were typical of most academic libraries and the response rate (5%) was disappointing despite efforts to engage the audience, it provided a baseline of data and a way to explain assessment principles to the library faculty and staff.

The Assessment Committee included those who held assessment-related positions, representatives from throughout the library who collected data for annual reports, and a couple of volunteers who were interested in learning about assessment and helping improve services. It is important to note that the Assessment Committee was established as part of a process to establish a committee structure to perform a variety of important functions across the library, including: art, exhibits, and displays; communications, marketing, and signage; outreach, external programming, and events; staff development and activities, etc. Creating library-wide committees engaged the entire library in ongoing work systematically and made it easier to organize new policies, procedures, and ways of thinking around a variety of important functions, including assessment.

The next step was to create a position that was dedicated to coordinating the library assessment program. Luckily, the associate university librarian for collections access and outreach services had the foresight to hire a librarian fascinated with and committed to assessment as the head of access services. In conversations with this high-energy, natural leader, it was evident that she was so passionate about assessment and visualization that she dreamed of devoting her career to it. The solution for how to form a dynamic, assessment program was in our midst. Unfortunately, she had to perform double-duty for at least six months while we reorganized the library and hired a replacement for her previous position.

And part of the reorganization of the library included pulling those dedicated to assessment from other departments under the head of assessment to form a new unit. The unit included the ethnographer who had previously reported directly to the dean, the usability assistant who was upgraded to usability coordinator and transferred from digital initiatives, and an assessment assistant who was moved from access services because of an interest in assessment. So we suddenly went from a disorganized, outward-facing assessment effort to a dedicated unit that took a team approach to assessing library activities supported by a library-wide committee to assist with execution and to help develop buy-in across the library. It took even longer to reseat the team together, but now they are nearby one another in the administrative area and love it!

We continued our efforts to engage with campus assessment efforts and the head of assessment was appointed to the academic affairs assessment team. Members of the library assessment team worked on assessment activities with other campus groups to develop library services to support specialized populations, such as veterans, students with young children, Greeks, disabled, etc.

One of the most fruitful efforts of the assessment team was developing a Student Library Advisory Board (LAB) with the Student Government Association, which provided dozens of suggestions from students on what services, spaces, resources, and technologies they wanted from their library. Now in its second year, LAB gives us a to-do list of improvements, but they are beginning to move towards lobbying the campus for funding for initiatives they care about such as 24/7 (rather than 24/5) hours and new study room furniture.

Present

The library had to distinguish between the assessment team and the committee as there was some concern about duplicating work. The assessment team carries out research, advises partners on appropriate research methods and tools, and helps analyze and communicate findings. The Assessment Committee discusses the assessment needs of the library and potential projects and ensures that our assessment projects align with the missions, visions, and strategic plans of the university, academic affairs, and the library. They also coordinate the annual statistical reporting, which had formerly been conducted by

the business manager. The focus of the committee shifts depending on changing library activities and priorities. The committee is comprised of employees from every department in the library.

Assessment requests have increased since the inception of the team—the more we do, the more we are asked to do or participate in more projects. For example, when a liaison is working on a new service or project, s/he will often include an assessment member during the planning process to ensure that assessment is a part of the project. Employees can request assessment projects through our project center, our homegrown digital ticketing system. Project center allows the team to track projects and produces a year-end report for the project lead and for the team. Library personnel have a greater understanding of assessment since the team has presented a number of brown bags on such topics as usability, project management, ethnography, and active learning. The assessment team provides updates on projects at our monthly all-staff meetings, so others can understand what we are doing and how it can help in a variety of situations. In addition, the assessment team has an open-door policy, so anyone can come in and ask questions at any time.

We have a wide variety of projects currently underway in the assessment unit. We are using tools such as Tableau and Gephi to help the library visualize data and communicate research findings. We are working with the Office of Adult Students and Evening Services, Greek Life, Veterans Affairs, and the Center for Graduate Life to better understand the needs of these populations and determine how the library can better serve them. In addition, we are working with Student Affairs to explore the broader impact of the library on retention and graduation, as well as our impact on student engagement. Usability studies are continuous to ensure efficiency, functionality, and desirability of the library's physical/digital services. For example, we conducted several usability studies to guide the redesign of the library website in 2016 and continue to test and improve the site during its lifecycle.

The head of assessment is currently working as visiting program officer on the ASERL new metrics project. The goal of this three-year project is to develop a toolkit for libraries to communicate their stories using existing data in new ways.

Future

A major initiative at J. Murrey Atkins Library is to engage with the greater Charlotte community because it is part of the university's mission statement:

> UNC Charlotte is North Carolina's urban research university. It leverages its location in the state's largest city to offer internationally competitive programs of research and creative activity, exemplary undergraduate, graduate, and professional programs, and a *focused set of community engagement initiatives*. UNC Charlotte maintains a *particular commitment to addressing the cultural, economic, educational, environmental, health, and social needs of the greater Charlotte region*.

The library is not known off-campus at all. We have unique collections, exhibits, events, and facilities that are open to the public. Given the mission, we need to engage with the community, share what we have, and determine what services they need from us. We want to attract them to enjoy our events, our collections, and our facilities. We know we need to have exhibits and activities that will bring them in and then assess what they want from us. We are beginning by engaging with the Charlotte Mecklenburg Library and looking for mutual digitization opportunities for related collections, participating in their speaker's bureau, and joint services. Once we get going, we will engage with the contacts to see what grabs their interest and build on it.

Future plans for the assessment committee include reviewing our data life cycle to ensure that we are storing what we need and eliminating outdated statistics. In addition, we will be proactive in meeting our strategic goals and help craft new goals as the need arises.

We also have a liaison who is very interested in assessment and serves as a dedicated liaison to our department. Her motivation offers an exciting opportunity that enables us to train others in assessment methodologies and best practices. The appointment of a liaison to research and instructional services solidifies the relationship between assessment and the primary communication conduit with faculty and academic departments and strengthens a formerly weak link to assessment.

We are observing an increase in new requests for assessment projects within the library and hence prioritizing projects has become important. We are also returning for follow-up evaluations of services and projects we already conducted. These opportunities combine to help us realize our vision to institutionalize ongoing assessment and improvement of our library services, collections, technologies, and spaces.

Our future goals include building a business intelligence system that will provide library leaders and team members the ability to access data at their point of need. The team will provide dashboards, data analysis, and assessment support, so the library can make data-driven decisions. The team is integrating data sources within the library and in conjunction with our campus partners. Our goal is to create a holistic picture of student success across myriad data points. Atkins can also use this data to better narrate our story in a way that illustrates the integral part we play in student success.

Writing the Library's Story, Three Outcomes at a Time

Luke Vilelle
Hollins University, USA

What started as a campus mandate at Hollins University has become the foundation of the Wyndham Robertson Library's assessment work, spurring action to make assessment a part of the library's annual work cycle. The library saw an opportunity to create a cycle of assessment—driven by library needs—that would benefit the library, its users, and the campus, while demonstrating the value of assessment to library staff members.

Approach

To prepare for an impending reaccreditation process, particularly the institutional effectiveness component, the Hollins University administration asked every department in 2013 to develop three outcomes to be assessed on a yearly basis. The library identifies three new outcomes for assessment every year, based on the assumption that three "evergreen" outcomes will not cover the wide range of the nine library principles identified in the ACRL Standards for Libraries in Higher Education (http://www.ala.org/acrl/standards/standardslibraries). Also, library priorities and projects vary from year to year, so the strategy of selecting three new outcomes each year allows the library to ensure assessment is conducted on its most impactful work.

All library staff are involved in the process, beginning with outcome selection. Each outcome must relate to the library's mission, must stem from an ACRL standard (preferably one not addressed in the previous round of assessment), and must provide immediate value to the library. After staff deliberation and selection of the year's desired outcomes, the university librarian identifies the staff member whose job responsibility relates most closely to that outcome, and asks that person to either coordinate the assessment of that outcome or to co-coordinate in tandem with the university librarian. One outcome each year must be a student learning outcome: we committed to this as part of an accompanying university-wide focus on student learning outcomes.

Findings

With this approach, the library is following in the footsteps of a long line of libraries that have sought to use outcomes assessment to improve their services and to show their value to the campus. Outcomes assessment began to be adopted by libraries in the early 2000s, as exemplified by the 2002 ALA publication, *An Action Plan for Outcomes Assessment in Your Library*, and the January/February 2002 issue of *The Journal of Academic Librarianship* devoted to outcomes assessment. Libraries shifted to outcomes, or measures of impact, from input and output measures. Library inputs include such measures as the number of staff and the size of the collection; outputs measure the activity at the library, such as material usage and instruction sessions. Outcomes assessment does not replace either input or output measures, but instead provides another viewpoint (frequently based on whether library users can achieve desired outcomes) to assess the effectiveness of the library.

Outcomes assessment is often used in conjunction with library instruction, as librarians work to measure whether students are learning. However, the term "outcomes assessment" does not have to refer to learning outcomes. As defined on the Hollins campus, desired outcomes could include any work related to a departmental mission that helped a part of the HU community achieve a desired goal. Thus, we are examining a broad measure of outcomes, which could include anything that displays the effectiveness of library work. Institutional effectiveness, to borrow a definition from Dugan and Hernon, "examines the extent to which institutions meet their stated mission, goals, and objectives."[1]

According to its mission, the Wyndham Robertson Library "fosters student success at Hollins University by teaching students to critically engage in the discovery and use of information; by connecting faculty and students with resources that advance scholarship and creative work; by strengthening the intellectual community; and by preserving and sharing Hollins' legacy." Any desired outcome that

the library wishes to measure must reflect either an aspect of the mission statement or one of the nine complementary fundamental commitments, available at http://presslib.hollins.edu/mission/.

The library also wanted its outcomes to reflect the ACRL Standards for Libraries in Higher Education because the document "provides us with a framework to think strategically about our value, role, and contributions to institutional effectiveness and assists us in our efforts to effectively communicate this importance to all of our constituents."[2]

Much has been written about the importance of assessment to the success of libraries; it seems nearly an equal amount has been written about obstacles to successful library assessment. Hiller, Kyrillidou, and Self drew upon an Association of Research Libraries study to examine "the organizational factors that facilitate and impede effective data use and the implications for assessment,"[3] and found that the two most critical determinants were "library leadership that promoted, supported, and used assessment, and an organizational culture that was customer-centered and motivated to improve library services."[4]

The assessment initiative at the Wyndham Robertson Library began with the university librarian, and was accompanied by a commitment to provide the necessary support (monetary or otherwise) to make assessment work. The library already possessed a customer-centered culture, as shown through an ACRL Excellence in Academic Libraries award in 2009 and consistently stellar library satisfaction scores on a biannual student survey.

With the climate ripe for effective assessment, we were determined to make the assessment meaningful. Given our small staff size of six librarians and three paraprofessionals, with everybody having multiple responsibilities, we knew we could not afford to waste our time on this university mandate without receiving something valuable out of the work.

To make the work relevant and meaningful, we decided to choose outcomes based on our impending work for the year. As an example, in 2014–15, we had recently installed shades and whiteboards in study rooms. Thus, we chose to focus on Standard 6 (space: "Libraries are the intellectual commons where users interact with ideas in both physical and virtual environments to expand learning and facilitate the creation of new knowledge"). We wanted to assess student reaction to these improvements, as well as find whether other small improvements could enhance the student experience in the library. We began gathering data on usage of particular library spaces, and also conducted targeted surveys both inside and outside the library to assess students' desires for working spaces. Our desired outcome was that "students will find physical spaces in the library to engage and explore in their intellectual pursuits."

In 2015–16, we knew we would be exploring a potential website redesign. Thus, we decided to base one outcome, "Members of the Hollins University community will discover resources that enhance their work through a virtual space provided by the library," on Standard 4 (discovery: "Libraries enable users to discover information in all formats through effective use of technology and organization of knowledge"). This outcome committed our IT librarian to usability testing, card sorting, and other web assessment efforts, and also raised the awareness of his work across the library.

All our outcomes assessment reports are available at http://presslib.hollins.edu/assessment/.

Value

In just two years, more than half the library staff engaged with the process as a coordinator or co-coordinator of an outcome assessment. The library has gained valuable information with which it could make immediate changes to improve services. And the assessment cycle has become ingrained in the library's yearly work.

- July/August (all staff): Review Standards and Mission / Staff meeting to select items for assessment / Instruction team meeting to select student learning outcome
- August/September: Selection of staff member to coordinate or co-coordinate / Design assessment measures and prepare timeline
- Fall and spring semesters: Gather assessment results / Use assessment results to make decisions for improvement
- May/June: Write assessment outcome reports and gather supporting documents for reporting / Send final report to director of institutional effectiveness

Much of the library has contributed to this work, with all our librarians except one having coordinated

or co-coordinated at least one outcome assessment. For example, our instruction coordinator has overseen each of the student learning outcome assessments. The outreach librarian co-coordinated our assessment of how well we encourage user feedback and transparently respond to suggestions. Our technical services and metadata librarian coordinated an assessment of our ability to process and catalog resources in a timely fashion. Our information technology librarian coordinated the assessment of community members' ability to find needed resources through our website.

The involvement of so many staff members has been critical to distributing the workload and ensuring that nobody sees assessment only as a library administration responsibility. Instead, assessment is everybody's responsibility.

The assessments have resulted in concrete changes to the library's services, resources, and spaces. Examples of changes we made, accompanied by the reason for the change, include:

- We created an assessment dashboard page for our website (http://presslib.hollins.edu/assessment/), where we share our assessment efforts with the community, based on an informal survey of other libraries to examine best practices in sharing assessment results.
- We placed lamps with outlets and USB ports on many of our study tables, replacing old lamps that did not have outlets. Student surveys, conducted both in the library and at the dining hall, had revealed dissatisfaction with outlets in the floor.
- We established a monthly blanket-washing schedule, in response to a whiteboard suggestion to keep the always-popular library blankets cleaner.
- On the library home page, we built additional and easier routes to our library databases, based on identification of a common "pain point" in usability studies.
- Our library usage studies (based on hourly census accounts across chosen weeks during academic semesters) highlighted underutilized spaces in the library, to which we made changes. As one example, we removed child-sized seating from the juvenile section and replaced it with beanbag chairs, which retained the playful feel and gave students a new seating option.
- We refocused our part-time cataloging assistants on their primary task of cataloging and processing newly received books, because the time lapse between book receipt and appearance on the shelf had grown to an unacceptable three months.

We expected our assessments to show areas for potential improvement, and they have, but the message of needed change is usually accompanied by strong positive feedback as well. Examples include:

- Although our study of cataloging and processing turnaround times showed that routine book processing times were a concern, rush requests were being handled in a prompt fashion.
- Our surveys about campus study spaces revealed that the library was the most popular place on campus to study.
- Assessment of our plagiarism-related student learning outcome found that a large majority of first-year students could cite sources correctly, and that they understood their responsibility to cite.

Good news helps to encourage library staff to respond to suggestions for improvement, knowing that students appreciate the work of the library and benefit from our efforts.

Last but not least, completing this assessment work on an annual basis provides a strong foundation with which to begin writing responses for regional accreditation standards. The institutional research office has these reports to demonstrate institutional effectiveness, and the library used pieces of the work in narratives for the most recent submission to the Southern Association of Schools and Colleges. The library director also includes the outcome assessments in his annual report to the vice president for academic administration (VPAA), and discusses them over the course of the academic year with the VPAA.

Next steps

Having established an ongoing cycle of assessment, the library's next step is to explore opportunities for integrating its assessment work (particularly in regards to student outcomes) with the assessment work being done by academic departments. All academic departments identified student learning outcomes to assess on a yearly basis, and some of those outcomes include skills commonly associated with information literacy outcomes.

We are moving forward in this area in 2016–17, with the inclusion of faculty volunteers on our team to

assess our library's student learning outcomes. We have faculty helping to create the assessment rubric and then evaluating, in tandem with librarians, 50-plus annotated bibliographies from a variety of courses.

We hope as faculty become more aware of our assessment work, and of our interest in ensuring that students are learning the information skills they need to succeed at both Hollins and in their careers, we will find increased opportunities to partner with faculty in the assessment of departmental student learning outcomes. In the meantime, we will continue to fold assessment into our annual cycle of work in the library, to ensure we are meeting our fundamental commitments and carrying out our mission statement.

Endnotes

1. Robert E. Dugan and Peter Hernon, "Outcomes Assessment: Not Synonymous with Inputs and Outputs," *The Journal of Academic Librarianship* 28, no. 6 (2002): 376.

2. Amanda Bird, Kelly Rhodes McBride, and Elizabeth Cramer, "Modeling ACRL's Standards for Libraries in Higher Education: A Path to Creating a Culture of Assessment," *College & Research Libraries News* 75, no. 11 (2014): 614.

3. Steve Hiller, Martha Kyrillidou, and Jim Self, "When the Evidence is Not Enough: Organizational Factors That Influence Effective and Successful Library Assessment," *Performance Measurement and Metrics* 9, no. 3 (2008): 224.

4. Ibid., 225.

Supporting Parents in Early Literacy through Libraries (SPELL): An Assessment of a Multi-Site Library Project

Beth Crist, Miranda Doran-Myers and Linda Hofschire
Colorado State Library, USA

Courtney Vidacovich Donovan
University of Colorado—Denver, USA

Introduction

There is a wealth of research demonstrating that speaking to, reading to, and interacting with very young children increases their learning ability and student performance later in life. The reverse has also been established—when children are not read to or talked to, their development can be inhibited, leaving them susceptible to learning difficulties later in life. This is especially pronounced among children with low-income parents. Despite the demonstrated importance of early literacy activities—talking, reading, daily interaction, etc.—there is a gap in the literature regarding the effectiveness of library practices geared towards low-income parents of very young children. This lack of published research often leaves library staff to experiment with early literacy programming without guidance or measures for success, resulting in varying degrees of effectiveness.

In order to fill in these research gaps and develop a set of best practices for early literacy programming, the Colorado State Library (CSL) undertook the SPELL (Supporting Parents in Early Literacy through Libraries) research project in 2012. In the first stage of the project, funded by an Institute of Museum and Library Services (IMLS) National Leadership Grant, SPELL researchers identified ways to reach low-income parents of children ages birth through three to provide them with early literacy methods that support adopting daily early literacy habits in the home. The SPELL research undertook four methods of collecting data: a literature review and analysis within and outside of the library field, a national environmental scan of programs successful in changing parental behavior, and surveys and focus groups with low-income parents of young children in four diverse communities.[1] The results of this research include a SPELL blueprint of recommendations that public libraries may use to empower low-income parents to embed early literacy activities into daily life. The blueprint outlines recommendations for implementing early literacy practices within the library facility, for outreach, partnering, and messaging within the library's community, and for addressing parental change in everyday early literacy practices.

The second stage of the SPELL project, funded by a second IMLS National Leadership Grant, put this blueprint to the test. In 2014, eight public libraries were selected throughout Colorado to partner with local organizations and create prototype programs based on the SPELL blueprint. These prototypes were tested in the field for one year to determine whether the SPELL blueprint recommendations were effective across different libraries and communities. Each of the eight prototype projects were evaluated for their efficacy in order to develop a set of best practices that public libraries may use, adapt, and scale to create effective early literacy programming in their communities. This paper summarizes the results of parent/caregiver evaluation data collected during the second stage of the SPELL project.

Literature Review

Early Literacy

Research has demonstrated that caregiver interaction, starting from birth, is crucial to the successful growth and development of a child. Reading aloud to children has been linked to helping children develop the pre-literacy skills necessary to begin the process of learning to read and write, such as recognizing letters and understanding that print represents a spoken word.[2] This is backed up by neurological research, which shows that reading to children and encouraging them to interact with

their environment helps the brain develop strong synapse connections that increase children's ability to learn and their student performance later in life.[3] The reverse is also true; when children are not read to or encouraged to explore their world, their development can be dramatically inhibited as the brain becomes less plastic and the "windows of opportunity" for learning close.[4]

The number of words a child hears before starting school is linked with performing well in kindergarten and beyond.[5] This tends to put children from low-income households, immigrant/refugee families, and otherwise marginalized populations at a disadvantage because they hear, on average, 30 million less words by age 3 than a child from a higher socioeconomic household.[6] This is largely because parents earning higher incomes tend to talk more to their babies at length, take them to the library more often, and have more books in the home.[7] The trend continues as the child gets older; Krashen and Shin found that children from all socioeconomic backgrounds progress in their reading at roughly the same rate during the school year, but high-income children make better progress over the summer simply because they have access to more books, whether at home or in the library.[8] To bridge this gap in learning and ensure that all children have an equal start in school, it is crucial that libraries have the tools to reach out to low-income parents to embed early literacy practices into daily life.

Benefits of Partnerships

The benefits of forming partnerships between libraries and external partners are well documented, especially to reach out to families with young children who are not aware of the library services that are available to them. Cooperation, collaboration, and partnerships are becoming increasingly important in libraries, particularly in the many cases in which libraries are expected to continue providing the same or more library resources and services after a budget cut.[9] The relationships between libraries, schools, museums, and other community institutions often allow libraries to continue to offer varied programming to their community without a budget increase.[10] Along with the expansion of library services, partnerships can also help the library to attract new audiences by reaching out to the patron base of the partner organization.[11] As Tarte and Aborn point out, the "advantages of partnering were clear to [library] staff: the partnerships allowed them to reach new families, introduce families to events and resources at the library, provide multiple opportunities and ways to educate families about early literacy, as well as to promote professional relationships among the other agency's staff."[12]

Library partnerships can be especially valuable for libraries working with immigrant populations. In a report on library services for immigrants, US Citizenship and Immigration Services (USCIS) and IMLS identified partnerships between libraries and immigrant-serving organizations as a way to provide information to and share resources with this hard-to-reach population.[13] When the immigrant population increases faster than the library budget, partnerships are also a cost-effective means of meeting the needs of library patrons and empower the libraries to provide "the best possible service to their community members" when funding is tight.[14] Forming partnerships with immigrant-serving organizations not only improves the services provided but also reinforces the library's role as a community social hub where every community member is welcome.[15]

Evaluating Children's Programs

As library-led early literacy programs and programs developed through partnerships become significant services within the library's community, experimentation and evaluation are necessary to ensure that these programs are effective. There is an overall lack of solid evaluation of early literacy program effectiveness within library science, and best practices are often defined too loosely to develop truly effective programs.[16] Experimental testing and evaluation are essential to provide libraries nationwide with model early literacy programs that can be easily replicated or scaled to be effective in very different settings.[17]

Evaluating early literacy programs is complex, often involving both quantitative and qualitative analysis across multiple sites over a period of time.[18] Although early literacy programs are typically left unevaluated, especially by quantitative methods, asking caregivers to fill out an evaluation survey is an increasingly common method of collecting quantitative data about early literacy programs.[19] While survey data is easier to represent in graphs and percentages, qualitative data collected through observation, interviews, and focus groups remains important to early literacy evaluation, especially when that data can be made more trustworthy using methods like analytic induction and triangulation.[20]

Cultural Barriers

Evaluation of early literacy programs also faces a cultural barrier when the programs are geared towards low-income families. The library's role as a community hub that supports immigrants, refugees, and low-income families is vital as a way to expand information literacy among these groups that are typically considered "information poor."[21] Addressing illiteracy in marginalized groups is critical, since illiteracy often prevents these populations from accessing information, participating in society, and teaching these behaviors to their children.[22] Urban immigrants constitute a group that is most at risk for illiteracy and information poverty, especially those that arrive in a new country with little education or knowledge of the country's language and have "fewer resources to facilitate integration, such as English language instruction or citizenship preparation courses."[23] As noted above, this would pose a risk to the children of marginalized groups, who benefit from being read and spoken to in English early on in order to be successful in school.

Many libraries in the Unites States and around the world make a conscious effort to hold events that are inclusive of immigrant and minority groups in their communities to bridge the literacy gap, but cultural barriers are certainly still present in public libraries, even as librarians work to overcome them.[24] These cultural and language barriers make it more difficult to draw immigrants, refugees, and other marginalized groups to the library for programming.[25] Even if the programs are successful in drawing an audience, these same cultural barriers still exist when librarians attempt to evaluate the effectiveness of the programs. Researchers often find that immigrants and refugees have had experiences in the past that have led them to distrust researchers, surveys, and any assurances of confidentiality because they do not trust that the researchers are acting independently of government agencies.[26] Given these challenges, survey-driven evaluation may not yield the desired results, so researchers recommend using a variety of evaluation methods when assessing programs that serve marginalized populations.[27]

SPELL Research

It is necessary to continually evaluate early literacy programs to ensure that libraries are providing the most effective programming possible during this crucial time in a child's learning. With this in mind, CSL created the SPELL project to contribute thorough research and evaluation concerning experimental early literacy programs in an array of communities to the existing literature. The SPELL research is unique for the eight prototype programs that targeted low-income populations. The prototypes were tested in the field for a year, were evaluated for their effectiveness, and yielded examples of early literacy programs that can be adapted to work in a variety of communities. SPELL recommendations can continue to be tested and revised to further define best practices for implementing and evaluating early literacy programs.

Methodology

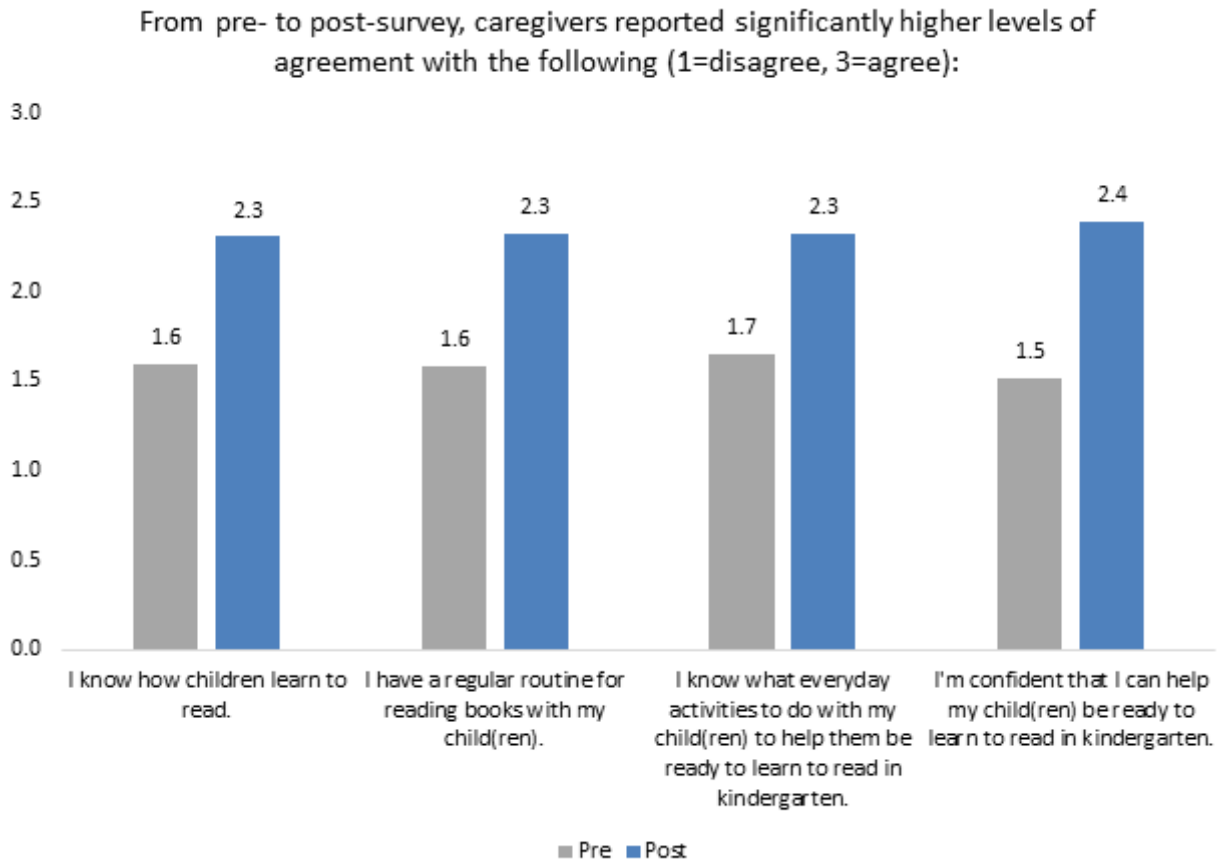
The SPELL libraries implemented their prototype programs between February 2015 and January 2016. During this one-year program prototype period, the evaluation was conducted. Its purpose was to determine the level of behavioral change in early literacy activities in parents participating in SPELL prototype programs. To accomplish this, libraries and partner organizations asked parents/caregivers to complete (a) pre-program surveys to collect baseline data about their beliefs about early literacy skill development and engagement in early literacy activities, and (b) post-program surveys that assessed changes in these beliefs and behaviors. Surveys were provided in English, Spanish, and one additional language based on the populations served by each prototype.

A total of 283 respondents were included in the pre-post survey analysis (181 pre-program respondents and 102 post-program respondents). Pre- and post-survey data were unmatched; the assumption was made that the sample was representative of the participating communities. A total of 60% of respondents had three-year-old children, 43% had two-year-olds, 42% had one-year-olds, and 35% had children under the age of one (percentages do not sum to 100 because some respondents had multiple children). Data were analyzed using independent sample *t* tests.

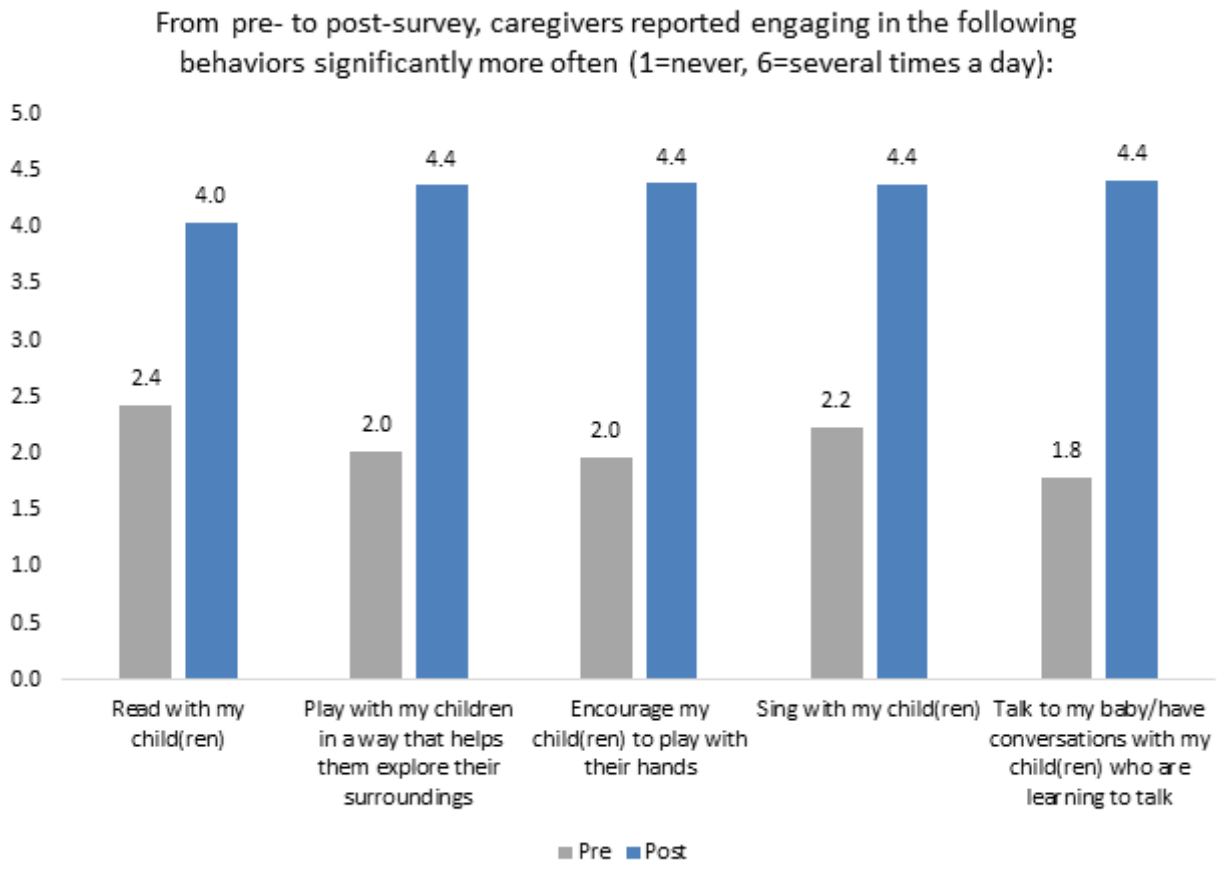
Results

Respondents were asked to indicate their agreement with a series of statements regarding reading. From pre- to post-survey, they indicated significantly higher levels of agreement with all items: "I know how children learn to read," t (183.16) = -6.86, $p < 0.001$; "I'm confident that I can help my child(ren) be ready to learn to read in kindergarten," t (272) = -8.47, $p < 0.001$; "I know what everyday activities to

do with my child(ren) to help them be ready to learn to read in kindergarten," *t* (271) = -6.39, p < 0.001; and "I have a regular routine for reading books with my child(ren)," *t* (275) = -7.13, p < 0.001:



Respondents were also asked to indicate how frequently they engaged in several early literacy behaviors. From pre- to post-survey, they indicated that they engaged in all behaviors significantly more often: "Read with my child(ren)," *t* (173.36) = -7.21, p < 0.001; "Talk to my baby/have conversations with my child(ren) who are learning to talk," t (160.61) = -10.07, p < 0.001; "Sing with my child(ren)," *t* (170.01) = -9.00, p < 0.001; "Encourage my child(ren) to play with their hands (give them toys and other small items to squeeze or pick up, show them how to point, trace letters, scribble, etc.)," *t* (165.46) = -9.63, p < 0.001; "Play with my children in a way that helps them explore their surroundings (shaking a rattle, playing peek-a-boo, cuddling with stuffed animals, playing house, making up games, etc.)," *t* (166.58) = -9.12, p < 0.001.



Finally, parents responded to an open-ended question: "Please let us know in your own words the difference this program has made for your child(ren) and family." Listed below are highlights from their responses:

> "It [literacy nights] has provided confirmation that we are doing the right things for our son's learning and structure for encouraging those behaviors/activities."
>
> "This class has given me lots of great ideas for play & learning w/ my child. I have a better understanding of how she is learning."
>
> "My child looks forward to every bookmobile day! He loves all the variety of books he can get and trying to figure out what words we are trying to read."
>
> "I'm pretty sure this is why my child loves books."
>
> "This program introduces us to new books and songs. Also, gives us more chances to interact with other children."
>
> "I have a new appreciation for the library knowing they have much more to offer than just books rentals."

Lessons Learned and Next Steps

Evaluating the large and diverse SPELL project was not without its challenges. Three of the most significant challenges were survey length, cultural barriers, and evaluating across multiple sites.

Survey Length

Creating surveys that gathered the required information, but were not so long that busy parents would be unwilling to take the time to complete them, was a challenging aspect of the SPELL evaluation. As a general rule, shorter surveys get more responses than longer surveys, especially when the respondent is a busy parent.

The pre-survey contained nine questions and the post-survey ranged from nine to fifteen questions (depending on the location). Several questions on each of these surveys included multiple parts. While each question was carefully assessed before it was included, the length and wordiness of the survey may have dissuaded some parents from completing it, especially if the survey was distributed while the caregiver was busy wrangling their children after a SPELL program. Since the survey was only provided on paper and required completion at a specific time, an alternative option would be to provide both the paper survey and an online link. This would give the respondent an opportunity to fill out the survey at their convenience.

Cultural Barriers with Surveys

Some of the parents participating in the SPELL program were immigrants and migrants living in Colorado. This posed a problem for the method of evaluation for the SPELL program. Immigrant and migrant parents often do not speak English as a first language and could not fill out the survey without assistance, which would sacrifice anonymity. Translating the surveys was helpful in some cases, but many of the parents were illiterate and could not communicate in writing. Although surveys are a familiar form of assessment for most groups, this was not the case for this population and many immigrant parents conveyed general mistrust for filling out surveys.

Due to these challenges, traditional survey evaluation may not be the most effective method for families that are part of migrant and refugee populations. It is important to be willing to accommodate their needs, and to be patient with them as trust is established and relationships develop. Preferred methods may include focus groups or personal interviews, despite the limitation of a small sample size. Another alternative is to have librarians/partners administer the survey after trust is established within the relationship, as parents will be more likely to provide information if they know that it will be used to help their families. It also important to use simple and direct language in the survey to minimize confusion for respondents who are not native English speakers.

Challenges of Multi-Site Evaluation

Evaluating programs consistently across eight sites also proved to be a challenge. While each site was working towards a similar overarching mission, each site chose to work with unique partners and programming. To develop an evaluation form that could accurately assess each program, questions needed to be broad enough to apply to each prototype but still provide useful information to SPELL librarians and researchers. This was achieved by focusing evaluation questions on the pre-determined goals of the entire SPELL project, such as learning how children learn to read and families' reading habits, rather than specific activities at each SPELL site. Advantages of this approach included the ability to aggregate across sites to boost the sample size and to evaluate the program as a whole; however, it is unclear whether unique features of the various sites impacted the findings. In addition, although survey administration training was provided, it is possible that there were inconsistencies in administration practices across sites.

What's Next?

CSL will employ SPELL's findings in a new grant project that began in October 2016, funded by a Colorado-based foundation, that will follow a similar project design with a target audience of unlicensed childcare providers instead of parents; CSL is following the SPELL model of the importance of outreach, collaborating with community organizations, and removing barriers to library use, as this unique audience also faces challenges to accessing services at the library. Finally, CSL is actively incorporating the SPELL evaluation findings into training efforts for Colorado library staff on outreach, partnering, serving low-income families, and other library services.

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Delighting Our Customers: Building Services Collaboratively with Learners at a Distance

Sam Dick and Selena Killick
The Open University, UK

Abstract

The Open University (OU) is the largest academic institution dedicated to distance learning in the United Kingdom, with over 173,000 students. Distance learning students can provide a unique perspective on the experience of the library. As the number of students enrolled in distance education courses continues to grow globally there is an increasing opportunity to work with distance students on service design and development. Engaging with distance students can be challenging, but not impossible. Here we will discuss how The Open University Library has utilised a number of methodologies to work in partnership with its students on service design to the benefit of the service and our students. This paper will provide practical value for any library service with a distance learning community. Specific methodologies of successful distance learner engagement will be presented, along with lessons learnt.

Background

The OU's mission is to be "Open to People, Places, Methods and Ideas," and since the OU's launch in 1969, nearly two million people worldwide have achieved their learning goals by studying with us. The OU teaches through its own unique method of distance learning, called "supported open learning," and it is the largest academic institution in the UK in terms of student numbers. It has:

- Over 170,000 students
- Nearly 6,000 tutors
- More than 1,100 full-time academic staff
- More than 3,500 support staff

Our students are motivated by the need to update their skills, get a qualification, boost their career, change direction, prove themselves, or keep mentally active. People of all ages and backgrounds study with us, for all sorts of reasons. This means that there is no such thing as a typical OU student. Over 75% of OU students work full- or part-time during their studies and the average age of a new undergraduate OU student is 29. In fact, 30% of new OU undergraduates are under 25 and only 9% of our new students are over 50.

The OU Library Service is focused on providing a world-class online library service for students, researchers, tutors and staff. The online library provides students and staff worldwide with access to trusted quality online library resources. A key element of the service is to help students study successfully and increase their employability. This is achieved by supporting students to develop digital and information literacy skills through designing and delivering embedded and targeted skills content and operating a 24/7 virtual helpdesk. We have a key role in supporting teaching at the university but also in supporting and enabling excellent academic research and scholarship.

Culture of student partnership

We have been and indeed still are on a journey of cultural change. Five years ago we were in a common position of designing and delivering services we thought our students wanted, without asking them what they wanted. We made some assumptions, we used our expertise, and we used a little existing data. Often our thinking was "We know what you need to succeed; we know what's best for you," what we have come to refer to as our "eat your greens" mentality.

We recognised that this approach was not working for us. Uptake in our services was not at the level we wanted. We spent a lot of time and energy developing new services only to find they were not what the students wanted or exactly what they needed. We knew the culture needed to shift.

We took a conscious decision to shift to an evidenced-based approach for our service development. All future service developments had to be informed by evidence that the new development or service change was relevant to our students and met their needs. This approach grew and developed

into our current culture of students as partners, based on a continual improvement ethos.

Student partners and collaborators

Our aim is to continually build, develop and improve our service based on the ever-changing needs of our students. Gone are the days where we tell our students what "they need;" instead we work with our students to understand their needs and experiences in order to deliver services and products that are relevant to their study journey and aspiration. It is a continual journey that will never be finished; at least that is our hope.

So, how do we engage with a student community that never comes to our campus?

Our previous biannual surveys had seen decreasing levels of engagement or response, and by 2012 this was down to an 8% response rate. This challenge was not unique to us; there were similar stories across the university. It was becoming increasingly difficult to get students to engage with any form of research activity regardless of format or method. There was one exception: we were successfully using social media to engage with students and have conversations about a range of products and services that were directly impacting our developments; we just were not using it as a channel for formal research projects.

We started to form an idea around the importance of building relationships as part of the engagement process and from there formed a working hypothesis:

If we could find a way to build and develop relationships with students and pre-engage them with the concept of contributing to and driving the development of library services (including why it was important) then they would be more likely to engage with subsequent research activity.

The student panel

We wanted a way to test not only the hypothesis but also a way to work more directly and collaboratively with students. We decided to establish a panel of students, a partnership community. This was a new approach for us and as such we were unsure if it would work in practical terms—from an administrative point of view—or if it would have the impact that we hoped in helping us to engage students. We therefore decided that we would run the panel initially as a one year pilot (which was subsequently extended to two years).

We worked closely with one of our internal university units, The Institute of Educational Technology (IET), as they at that time coordinated most of the student research work for the university. We knew that they would need to provide initial recruitment samples and track panel involvement in research activities. They were also a key part of working out some of the initial mechanics of managing the panel.

We currently recruit to the panel twice a year. A sample of 4,500 students from across all subject areas and levels of study are invited to join the panel in March and a second sample of a similar size is invited in November. These dates tie in closely with key university student start dates. From these two cohorts each year we recruit a total panel size of around 500 students, which is broadly demographically representative of the larger student body.

Students are asked to be part of the panel for a period of 12 months although they are able to withdraw at any time. During the recruitment process we ask students to let us know if there are any particular research methods (such as focus groups, surveys, usability testing) that they would rather opt out of. This has proved to be an important step in the process. It ensures students have control of the types of activities that they may be asked to take part in, it reduces the "unknowns" for students thinking of joining the panel, and it helps us manage possible student availability for individual pieces of research.

Each student on the panel is able to opt in to a maximum of four research activities within a 12 month period. Each time a new research activity is planned, the panel (or a sample) is contacted (excluding any students that have opted out of a particular method) and the students are asked if they would like to participate. This additional step means that even though they are members of the panel, students will still have the option to take part in activities on a case-by-case basis. Again, this ensures that students have control themselves over their participation in research activities. A lot can change for our students in 12 months or even week by week, so this approach helps students manage their input and not feel overwhelmed by their involvement.

A vital element of the panel is ensuring continued engagement and conversations with students. Our panelists want to understand the impact of the role they are playing. We ensure that the panel receives quarterly updates from us about the research work we are doing and the impact that it is having on how we support students. Those actively involved in the research will receive additional updates or research summaries after each piece of research.

The panel is managed by a small Quality and Insight Team within Library Services but they themselves work closely with other library colleagues who may be running or commissioning the research. A road map of planned research is developed with colleagues and shared with library staff to ensure equity of access to the panel. We do, however, build in capacity for ad-hoc or unplanned work as this can represent a substantial amount of research activity at times.

We do not offer mass scale incentives to students, however those participating in large or complex projects will be offered nominal vouchers (usually Amazon or a suitable alternative for countries where Amazon does not operate). This means that small projects such as surveys or short user experience activities do not receive vouchers or incentives. When students join the panel they receive a small welcome pack that contains information that introduces them to the panel and how it works. The welcome pack also includes a Library Services cotton bag and a library panel branded notebook and pen. Our current phase of panel development includes building an online community space based initially in our virtual learning environment. This will facilitate ongoing discussions, information sharing, and increased peer-to-peer connections. We are also about to trial prototype certificates of participation and downloadable skills portfolios for students to use to evidence the skills they are learning and using whilst working with us on research projects.

Panel impact on engagement

During the evaluation of the pilot in 2014 we analysed two surveys that were similar in terms of project "size." Although not an in-depth analysis of all research undertaken by the panel, it did illustrate some interesting areas that supported our personal reflections on how the panel was performing.

	Survey 1	Survey 2
Sample source[1]	General sample	Student panel
Size of sample	3,000	500
Approximate response rate	8%	80%
Total number of responses	240	400
Estimated cost per response[2]	£1.88	£1.28

The student panel in action

We have worked with students on research activities of varying sizes and intensity including exploring expectations, impact, user experience, product specification, and usability. The following illustrate two very different examples of the student panel in action.

Example 1: Library Search

Like many libraries we knew there was a problem with our online information discovery and students were telling us how unhappy they were. Since the early 2000s we had been using SFX for our journal link resolver and Voyager Library management system for our book records, along with countless other databases. However as electronic information provision has developed, so too have our students' expectations and needs.

We started with a literature search and background research, first focusing on existing user research in libraries about discovery services. We always planned to get students involved but we needed to understand how to frame the business challenge we were facing and, at this stage, we had not conducted much user research so it was also an opportunity to test our perceptions of user expectations. One of the challenges we faced was that other university libraries have greater opportunities for interaction and learning from their students so interaction opportunities needed to be created.

The first round of usability interviews (18 people) was used to compare existing search tools (Primo, Summon, an EDS discovery tool, Google Scholar, and an internally-developed search portal). This was done remotely using a tool called TeamViewer[3] that allowed us to watch student screen actions and talk to them in real time. TeamViewer is technically a support screen-sharing tool, but it has built-in recording and shares screens automatically without having to prompt users. It is very easy for students and facilitators. Students were asked to "think aloud" and to verbalise their thinking as they moved around the interfaces. In hindsight, we should have asked the students to look at two versions of each search tool type to avoid influence of how institutions had configured and implemented the tools. We measured the time taken to complete the different activities, as well as the success rate. This helped get a picture to compare EDS, Summon, and Primo in a quantitative way as well as qualitative and informed the tendering criteria in terms of what was essential and less important.

To test our understanding and analysis from the first round of interviews, wireframes of search interfaces were developed using an online tool called Balsamiq.[4] These were converted to "screenshots" that could be used for first click testing (using Chalkmark[5] from a suite of online interactive testing tools from Optimal Workshop) with students using the same search tasks from the first round. Online wireframe testing was new to us at this stage, however it worked incredibly well and we have used it regularly since this initial project. Our next step was to build a concept interface to sit over the top of our internal search tool so that we could test key findings and required functionality (as best we could recreate without rebuilding a full search tool). This working prototype was then tested again online using the same activity approach. One of the advantages of doing this remotely was that students were not aware they were being timed so their natural behaviour was not influenced.

All testing was remote, but staff were invited to come along to a separate observation room and watch the testing. This helped with staff engagement in terms of accepting the findings and the role of working more closely with students. The approach we took used one facilitator plus a note taker, which proved much easier than one person fulfilling both roles. We decided not to have librarians facilitating the testing as we had found that it was difficult for them to resist the urge to teach during the sessions. We found there was also reduced unconscious bias if the people involved in the research were not aligned to the area being evaluated.

Working closely with students to understand genuine needs and realistic approaches to search activities ensured we were able to define robust user requirements for the tendering process. We were also able to produce well-defined technical requirements for the technical specification and then to refine developments at the implementation stage. The impact of the approach also led to a strategy of incremental change for the library search tool with a new interface design rolled out along with changes to terminology.

Example 2: Impact of Library Services

We have implemented an annual programme of 1:1 student interviews to explore the role the library has played in their studies. This initially stemmed from a desire to be able to articulate the impact the OU Library was having on students and their study experience, to understand how students perceive the OU Library, and how students would like to see things improve. Each year we interview 10–12 students by telephone. There are clear objectives for the interviews but a key part of the approach is that there are a very small number of pre-scripted questions. Staff conducting the interviews are able to follow conversations in an organic way within three broad areas defined by the objectives:

1. Expectations of the library at the start of their studies
2. Role of library during their studies
3. What use (or non-use) was made of the library

This flexibility has meant interviewers have been able to take the time to genuinely explore student areas of concern, suggestions and understand the realities of using library services.

The interviews are transcribed and analysed with key themes across the research being pulled out. An overview report is compiled looking at the key themes for this year whilst also looking at the previous years' themes. The findings are then also grouped and shared with specific service owners for them to enact any necessary changes or further investigations. We also synthesise each of the interviews into an anonymised one-page case study that staff can use with colleagues across the university to demonstrate library use or as an advocacy or influencing tool. For example, our

academic liaison librarians have used the case studies during discussions with faculty colleagues to highlight the positive impact of including integrated library content and embedded skills development activities within student learning materials and courses. The findings from the interviews also add to our holistic evidence base.

These annual interviews have led to a number of new developments or changes to services already in place. They have also provided valuable evidence to influence wider university decisions or initiatives. These have included students suggesting the top three areas to share with other students to be included in a new undergraduate student video, working with the university to improve the student induction, introducing new initiatives to increase the visibility of the OU Library, and making changes to the library website to improve navigation. The importance of this insight and evidence should not be underestimated. For a number of years Library Services has been working to influence a change in the universal university student website header, so that a link to Library Services was included. Genuine evidence from students supporting the need for increased visibility helped us build a much stronger case with the university to implement our proposed change to the header. We were able to use the data and evidence we had and this change has now been implemented. We were also able to highlight this to students as part of the research and communication loop.

Conclusions

We have found that, to date, the way we have developed and worked with the student panel has greatly improved student engagement and collaboration. The engagement is above the level we had hoped for or anticipated (although we were starting from a low 8% survey response rate) and, whilst other parts of the university may find it difficult to get students to engage, our experience is very different.

Our major learning point is that communication is key. Having the conversations and keeping students in the loop about the research is one of the most import elements of the panel. Without this there is not any additional engagement with students above other research activities and it is this engagement that keeps students involved and interested. We make sure we give feedback at the end of the piece of research and every quarter we e-mail the whole panel with a summary of the quarter's research. This includes what we have looked at, what students said, and what we are doing as a result. Students have told us that they like to see their contribution having an impact. So we ensure that we actually do make decisions, implement changes, or build new services as a result. We do not let our learning slip away or the student voice fade into history. It is hard but we have tried to ensure that we take action and then we make sure we highlight that impact to students and staff. There is still room for improvement, and certainly we could have a faster pace of change or implementation. Anecdotally we have heard that our approach is changing student perceptions and increasing their trust in us to really listen and respond to the student voice.

Greater collaboration with students has led to us having more opportunities to listen. The panelists are talking to us about things beyond the areas we start to research with them so we are not the only ones instigating conversations. Students are guiding new conversations, too, and this has been both empowering and liberating. We are certainly gaining a much better understanding of student needs and frustrations through working with students (we definitely make fewer assumptions!), and the panel provides a very effective vehicle for this research. The panel and our closer relationship with students has forced our cultural change to happen at a faster pace so that we are more transparent now, and this is feeding the cycle of engagement with students on the panel seeing and acknowledging that we take what they say seriously.

One of the largest benefits is our visibility and influence. For example, students directly articulating how important it is for library induction to be included at the early stages of qualifications rather than later has had more influence with colleagues in other units than us expressing the same sentiment. Being able to tell the rest of the university the diverse and compelling stories of where our library service has supported or improved a student experience in their words has helped us articulate the benefits of the service.

We have also learned that incentives are not the only driver for engagement. Students often wanted recognition and to see changes more than they wanted to receive an incentive. For Library Services, recognition comes in the form of our commitment to sharing our findings in a transparent way and

showcasing students as partners and collaborators, in supporting students to build individual skills portfolios and awarding certificates of participation. Our cultural change has been key to demonstrating that we are making decisions and taking the action needed for students to see that changes do take place.

Our work has had wider impact than we expected with the university identifying the student panel as an area of good practice, increasing interest in student engagement and user experience activity across the university, whilst at the same time showcasing Library Services.

We have, however, had to learn to be brave and to be open. Essentially the research we conduct or the work we complete with the student panel is focussed on supporting our decision making. To be true to that, we learned that we would hear things we did not like or in some cases disagreed with, but we still had to listen. However, that openness and willingness to hear accurate and genuine feedback, to garner real insight and to act on that insight, is what is helping us deliver better services to our students.

Sam Dick
Quality and Insight Manager, The Open University Library (UK)
sam.dick@open.ac.uk

Selena Killick
Library Services Manager (Student Engagement), The Open University Library (UK)
selena.killick@open.ac.uk

Endnotes

1. Survey 1 used a general sample from the entire OU student population and Survey 2 used the student panel.

2. The estimated cost is based on staff time only (15 hours of staff time for general survey, 17 hours of staff time for the panel survey). No financial incentives were offered to students.

3. TeamViewer, https://www.teamviewer.com/en/.

4. Balsamiq, https://balsamiq.com/.

5. "Chalkmark," Optimal Workshop, https://www.optimalworkshop.com/chalkmark.

Evaluating from Arm's Length: Assessing Services Provided by a Library Consortium

Sabina Pagotto, Kathryn Barrett, and Katya Pereyaslavska
Scholars Portal, Ontario Council of University Libraries, Canada

Abstract

Assessing services provided by a consortium presents a slightly different set of challenges than assessing services provided by a library. However, there is very little literature on the subject, even though member libraries are increasingly eager to know the quality and value of the services they receive from consortia. This paper seeks to bridge that gap by discussing the challenges faced and strategies used by Scholars Portal, the service provider for an academic library consortium, in assessing its services.

The distance between consortium and end users, a relationship mediated to varying degrees by the user's local library, presents a difficult challenge and must be acknowledged in assessment planning. While every service provided by Scholars Portal has a different user base and different outcomes, making consistency of measurement across services difficult, consistency of assessment practices within each service is vital to tracking our performance and communicating our value to members. More streamlined and consistent evaluation tools for Scholars Portal services are being developed, helping us to more effectively track our performance and communicate our value to members.

Introduction

As budgets shrink or remain static while demand for resources grows, assessment is an increasingly important part of day-to-day operations for academic libraries. Given the current climate, it would appear shortsighted for any library to offer a new service without thinking about how its outcomes could be properly assessed. Budgetary restrictions also mean that there is a greater value placed on developing consortial solutions where multiple partners can defray the costs affiliated with providing a new service. And yet, the assessment of consortia and consortially-provided services is lagging behind, with very little literature dedicated to this area.

The Ontario Council of University Libraries (OCUL) is a consortium of Ontario's 21 university libraries. OCUL leverages collective resources to negotiate, purchase, and steward electronic collections. OCUL also provides digital infrastructure through Scholars Portal, the consortium's service arm. Introduced in 2002 to provide a platform to host OCUL's electronic journals content, Scholars Portal quickly expanded to provide support for SFX, an OpenURL link resolver, and RACER, an automated interlibrary loan system. Scholars Portal has since developed a wide range of content repositories and member services supporting collections, digital preservation, research, and data.

The same forces that have driven the growth of the assessment culture in libraries and the practice of evidence-based librarianship are also present in the consortial environment. As a result, it is necessary for OCUL to demonstrate its value to member institutions and provide librarians at these institutions with the tools and information they need to justify consortial membership to their own stakeholders. Meanwhile, Scholars Portal, as OCUL's service provider, needs to ensure that the services we provide meet the needs of both member libraries and end users.

The member services team at Scholars Portal has begun to revisit the assessment practices of our services. This paper highlights three case studies of consortial services with different user bases and different assessment needs. Two are services for end users: (1) Ask a Librarian, a virtual reference service, and (2) the Accessible Content e-Portal (ACE), an accessible texts repository. One service is directed at libraries, our management of SFX, an OpenURL link resolver, and its associated knowledgebase. In each case, current assessment practices were documented, their strengths and weaknesses were evaluated, and new assessment measures recommended.

Literature Review

The majority of the existing literature about assessing consortia focuses around the content that the consortium provides. This type of assessment has already been performed at OCUL.[1] Newer and more innovative approaches have been taken by organizations such as the California Digital Library, which has been at the forefront of developing objective metrics for evaluating big deal journal packages, informing practices across similar organizations.[2]

Beyond this focus on content, Chadwell[3] has argued persuasively that consortia owe it to their members to articulate a value proposition and demonstrate that they actually provide that value. In a Canadian case that would be familiar to OCUL members, the Canadian Research Knowledge Network (CRKN) had conducted an academic-style external review to assess its organizational and negotiation effectiveness.[4] While this review did give CRKN members some ability to benchmark CRKN's effectiveness compared to other consortia, it also highlighted the difficulty of such cross-consortial comparisons. Library consortia are incredibly varied in terms of mandate, offerings, funding, and organizational structures. This diversity of organizational membership may be one of the reasons that assessment literature about consortia is so sparse. There may in fact be a great deal of evaluation of library consortia, but it is simply not distributed beyond the immediate consortial membership.

Assessing Library Accessibility Services

Library accessibility is a very new field for academic libraries with a modest body of publications dedicated specifically to this topic. Literature on assessment of library accessibility services is largely borrowed from more general subjects, such as evaluating public and technical services. In *Research & Practice in Assessment,*[5] the need to move beyond usage data is emphasized, stressing the value of linking student usage of accessibility services to the user's academic performance. This measure is extremely difficult to evaluate and would involve a variety of stakeholders and some potentially private data.

Besara and Kinsley[6] also touch on assessment of student success and stress the value of working with campus-wide initiatives and stakeholders to develop programs that are evidence-based. In the case of consortial initiatives, this is extremely difficult to do because of the disconnect between the staff who support these services and their end users. For library accessibility initiatives, consortia can help with policy development and implementations of shared resources and guides; however, they rely heavily on the actual university staff to conduct their own assessment and to provide feedback with regard to future direction. What consortia are very good at doing is connecting individuals from different institutions who share similar institutional goals to establish a community of practice that can collectively develop best practices and support future initiatives in these areas.

Literature related to technical services can also be applied to the assessment of library accessibility services. Mugridge[7] studied sixty libraries and their assessment practices and concluded that statistics, usage data, input from nontechnical staff, surveys, anonymous suggestion box comments and input from focus groups all provided useful assessment strategies. Thinking about who will receive these assessment reports, streamlining assessment processes and working collaboratively helped in the development of better departmental strategies and information sharing.

In the case of initiatives such as ACE, all of the above methods of assessment have been successfully utilized to produce dynamic annual reports that are then circulated across community membership as well as administration. Given the existing issues with regard to medical privacy when serving users with disabilities, broader strategies can be employed by soliciting input from an advisory group. Ensuring that all members are happy to talk about their experiences with others in a group is critical in ensuring a fair and equitable approach.

Assessing Virtual Reference Services

Evaluation is critical for virtual reference services, as they require complex planning and are resource-intensive.[8] Regular assessment is essential to demonstrate to library administration that virtual reference services are meeting user needs, providing value, and using resources efficiently.[9]

Virtual reference services are most commonly evaluated from two perspectives: the service perspective and the user perspective. The service perspective is concerned with the efficiency, quality, and cost-effectiveness of a particular service. They

might examine the volume of questions handled over a unit of time, the types of questions submitted, the completeness and correctness of the responses, and librarians' adherence to behavioral standards.[10] Data is collected from chat logs, statistics, and transcripts captured by the software.[11]

The user perspective is concerned with the effectiveness of the service, and takes into account the user's satisfaction with the information provided and the assistance received.[12] Evaluations from this perspective study users' awareness of the chat service, preference for chat compared to other library services, and perceptions and feedback about the service, including usability, satisfaction, and willingness to return.[13] Data is commonly collected through exit surveys, but studies can also incorporate observation, interviews, focus groups, and usability analyses.[14]

Inspired by business research demonstrating a direct relationship between employee attitudes and customer satisfaction, library services are increasingly being evaluated from the perspective of the librarian.[15] Recently, studies in the virtual reference literature have begun to examine library staff's attitudes toward and experiences of virtual reference services.[16]

Evaluating a consortial chat service adds an extra layer of complexity, as it necessitates assessing the service from the perspective of the participating libraries.[17] To understand how the service is used across the partnership, consortia analyze the proportion of questions submitted by users at each library or the number of questions handled by each institution's operators,[18] or how well participating libraries meet virtual reference quality standards developed for consortia, such as those outlined by Kasowitz and colleagues.[19]

Assessing Link Resolvers

Assessment literature involving link resolvers has primarily focused on using link resolvers to assess collection usage or identify causes for broken links and other metadata-related problems. However, several pioneering studies have evaluated the link resolver itself as a tool. Staff feedback is an important metric for assessing link resolver effectiveness. Livingston, Sanford, and Bretthauer[20] and Breeding[21] used surveys to ask library staff how they felt about the link resolver they used in order to compare products currently on the market.

While considering the staff perspective is vital, usability testing and usage log analysis help develop a full picture of how users experience the front-end interface. Staff feedback was used in conjunction with usability testing by Johnson, Leonard, and Wiswell[22] as they prepared to switch link resolvers. While staff responded to a survey about the link resolver back-end, users were given tasks to accomplish using the link resolver menu. Meanwhile, Highsmith and Ponsford[23] analyzed usage logs to determine how their users interacted with the link resolver menu. Based on these findings, the link resolver menu was changed to more clearly point to the full-text content. A follow-up usability test revealed that these changes improved user experience and suggested more fine-tuned improvements.[24] Automated statistics were also used by Ashmore, Allee, and Wood[25] when they analyzed interlibrary loan requests that were cancelled because the material was held locally, implying that the users were unable to determine from the link resolver menu that the library already had the material. This allowed the authors to identify areas of confusion within the link resolver menu design.

While all of these studies were performed on institutional instances of link resolvers, some of these techniques, such as the innovative use of log data, could easily be applied at the consortial level. With such a small body of literature, best practices for link resolver assessment have yet to be determined, but it is instructive that most institutions have used more than one method of assessment.

Case Studies

Hamstrung by budget cuts, OCUL member libraries increasingly expect both OCUL and Scholars Portal to demonstrate the value that they offer, in order to justify the expense of consortial membership. In addition, for specific Scholars Portal services, there has been more demand for granular and sophisticated usage statistics from librarians who want to make informed decisions. In some cases, members are opting out from services in which they previously participated. The impetus for these case studies was to ensure our assessment practices allow us to demonstrate our value to libraries, enable librarians to assess how well our services meet their users' needs, and identify areas of member dissatisfaction.

The Accessible Content e-Portal
The Accessible Content e-Portal (ACE) was funded by a one-time provincial grant and began as a pilot project in 2013, which upon successful completion became an ongoing Scholars Portal service in 2014. When the service was in its infancy, assessment was conducted on an informal basis, until 2015 when the decision to create an annual assessment plan as part of formalizing the structure of the service was made.

ACE continues to grow, aided by the Integrated Accessibility Standards, which fall under the Accessibility for Ontarians with Disabilities Act (AODA). Its mandate has developed accordingly; beyond offering a text repository, ACE has fostered a community of practice, and expanded its offerings beyond OCUL institutions in 2015 to include Ontario colleges (OCLS). This new partnership has also highlighted a strong need for reviewing existing assessment strategies and expanding that repertoire of measures to accommodate new partnership interests.

In the fall of 2015, work began in developing the first draft of the ACE annual assessment plan by documenting existing measures, interviewing stakeholders, and conducting a literature review. The ACE service team worked with a University of Toronto iSchool practicum student to help identify what was currently being tracked and what was possible to be tracked within the workflow and technological framework of the service.

Key areas of investigation focused on the following questions:
- How well are we serving our end users?
- How well are we serving library staff?
- Quality and timeliness?
- Are we a cost-effective way to meet the AODA goals?
- Are we meeting our own goals of reducing/preventing duplication of labour?

One key challenge to the assessment of this service is the anonymity of its users, due to the service's aim of protecting their privacy. It is difficult to speak to users when we are not supposed to know who they are. There is a feedback survey that is used occasionally, but we have very little idea of the nonresponse rate. Sometimes the feedback is passed along to us from staff, but this does not provide a complete picture. Additionally, the experience is very different for individuals depending on their disability and what assistive technology they are using to experience the service.

The ACE service does have a robust user advisory group comprised of library users with a variety of abilities, ranging from undergraduate and graduate students to faculty, which provides input with regard to testing new features and troubleshooting. However, it is a smaller group of users who do not represent the vast breadth of disabilities and learning techniques of the day-to-day service users.

By November 2015, the sample Annual Assessment Plan was drafted for review by the ACE working group, comprised of accessibility staff from across OCUL institutions. This document contained a vital section with an assessment template. Reports were generated for the first time in spring 2016. The actual creation of these reports brought forth new issues about who was interested in which measures, as well as technical problems, such as some forms of usage not being properly tracked. The assessment template developed as a part of this report will be adapted to other OCUL services, in order to improve transparency and increase consistency with regard to comparing how various services are performing and the measures that are available to member institutions to use in their own annual reports.

Ask a Librarian/Clavardez avec nos Bibliothécaires
The Ask a Librarian virtual reference service launched in 2011 and continues to grow. Originally, Ask a Librarian provided service in English only. In 2014, a French version of the chat service, called *Clavardez avec nos Bibliothécaires* ("Chat with our Librarians"), launched as a two-year pilot project. Made possible by funding from the Canada-Ontario Agreement on French Language Service, *Clavardez* enabled university libraries with bilingual service mandates to join the chat service.

Coordinators of both services have regularly collected usage statistics, user demographics, and patron satisfaction ratings at the consortial level from pre-chat and exit surveys and chat session records. These statistics inform management decisions, such as staffing levels, operator training, and potential improvements. The service coordinators also regularly collect usage statistics for each participating library. In addition to helping service coordinators understand local usage patterns, these statistics are used by OCUL to

calculate each library's participation fees, as Ask/*Clavardez* is not covered by OCUL membership fees. Furthermore, the coordinators track the number of questions answered by operators and the exit survey responses of users at each participating library, as these statistics are often reported to university administration to help demonstrate the value offered by the consortium.

Several evaluation projects have also focused on aspects of the chat services. Soon after Ask a Librarian launched, Maidenberg, et al.[26] performed a transcript analysis to understand how patrons were using the service and Logan, et al.[27] performed content analysis on questions posed through Ask a Librarian and her library's FAQ service to compare search behaviors across virtual reference mediums. Another project focused on operators' adherence to RUSA behavioral guidelines and the effect operator behaviors have on patron satisfaction.[28] Finally, assessment of the French pilot involved analyzing French chat transcripts and interviewing bilingual operators.[29]

Most of Ask and *Clavardez*'s regular evaluation efforts have been performed from consortial, library, and user perspectives, with a focus on transactional statistics and user feedback. However, examining usage and user satisfaction is only part of measuring service effectiveness.[30] To fully understand how a chat service is performing, it is necessary to examine the content of transactions and the quality of answers, in order to identify user needs and measure how well they are being met. This could be achieved by periodic transcript analysis. Furthermore, to ensure resources are being utilized effectively, the cost-effectiveness and return-on-investment of Ask and *Clavardez* should be explored.

To date, user-centered evaluations of Ask/*Clavardez* have focused narrowly on satisfaction. To achieve a more holistic understanding of how the services are perceived, it would be advisable to examine users' awareness of the service, preferences for various information sources, reasons for use or nonuse of chat, and perceptions of the services' usability. This could be achieved through a range of qualitative research methods, such as interviews, focus groups, or observation.

Finally, aside from Laflamme's[31] interviews of *Clavardez*'s francophone operators, the librarian perspective has been largely neglected. Operators' perceptions and experiences should be incorporated into standard assessment practices. This is currently of particular importance, as the chat services recently migrated to a new platform, and service coordinators would like to understand how this has affected staff morale.

SFX

Scholars Portal has managed a consortial instance of SFX, the OpenURL link resolver provided by Ex Libris, since 2002. Link resolvers facilitate the connection between a citation or a metadata record and the full-text resource by drawing on a knowledgebase of electronic holdings information. Initially, this SFX instance was intended to support the use of the locally hosted e-journals platform at Scholars Portal, and staff continue to maintain a target within the knowledgebase using the holdings on our journals platform.

As a "core" service of Scholars Portal, SFX is funded directly from OCUL membership fees. Despite this, a number of libraries have stopped using the service in recent years. Nearly a third of OCUL institutions have dropped the service entirely, while others have reduced their usage as they supplement SFX with another link resolver or knowledgebase. This has raised questions at Scholars Portal, such as:

- Is it still true that consortially maintaining a link resolver and knowledgebase saves staff time at member institutions?
- Is SFX still effective as a product?
- If Scholars Portal moves to a different product, such as a next-generation library system, how can we ensure that the product we select and the support we provide meet member needs?

In spring 2016, the OCUL-Scholars Portal committee, Scholars Portal's governing committee, distributed a survey to OCUL members asking about their use (or lack thereof) of the SFX link resolver and knowledgebase, as well as other locally managed products. Findings were mixed. Schools without the in-house expertise or capacity to maintain a knowledgebase found a great deal of value in having this service consortially. On the other hand, libraries that use a discovery layer found themselves dealing with two knowledgebases. This redundancy led some to drop SFX. Libraries that use another link resolver in addition to SFX were able to pinpoint some pros and cons to SFX and their other tool, but no clear winner emerged.

This survey revealed some interesting considerations for future attempts at evaluating SFX. In some cases, it was difficult for the school's representative on the OCUL-SP committee to determine which individual at the institution should be answering this survey—a lack of communication channels which might help explain why Scholars Portal has been receiving so little feedback with regards to SFX. Additionally, the survey highlighted a stark distinction between large and small schools. At large institutions, there was enough local expertise that staff had informed opinions about what features were important in link resolvers and enough local capacity to maintain a separate knowledgebase. At small schools, staff did not have enough capacity and found consortial management of a knowledgebase very valuable, but often did not know much about different link resolver products and the features they offered. These twin dilemmas—that the schools who most relied on Scholars Portal's management of SFX had the fewest opinions on link resolvers as a whole, and the lack of communication between the decision makers at Scholars Portal and the institutional staff who work with link resolvers regularly—must be taken into account in future assessment methods and tasks.

Thus, the OCUL-SP survey did not provide clear answers to the questions that framed this investigation. However, responses to the survey did illuminate divisions within OCUL membership, identify areas for further investigation, and highlight the need to check in regularly to see how well SFX meets the needs of member libraries. In consultation with OCUL-SP, Scholars Portal staff hope to develop an assessment plan to track member satisfaction with SFX.

Discussion

Scholars Portal has never had coordinated assessment plans covering its suite of services. Typically, assessment has been performed on an ad hoc basis, and workflows and technologies have often dictated which data was collected. Consequently, assessment practices have sometimes been based on the information that is the most expedient or convenient to collect, or specific measures that specialty focus groups had requested, rather than a more comprehensive plan that would shed the most light on Scholars Portal's value or the institutional goals or priorities of OCUL members. Evaluations have also skewed heavily towards statistics, at the expense of rich qualitative information. Scholars Portal is now trying to bridge this gap by formalizing assessment practices across its services, beginning with ACE, Ask a Librarian, and SFX. These three services each have assessment plans in different stages of development.

The Accessible Content e-Portal assessment plan was developed in consultation with the service's working group. The development involved reviewing ongoing practices and identifying new areas where value could be found. A template was created, including key components: measuring institutional usage (usage statistics, collection size, number of users), measuring user satisfaction (quantitative and qualitative user feedback), and service team efficiency (turnaround time, troubleshooting time, technical issues resolved). The hardest aspect of conducting assessment for ACE was the missing feedback from participating institutions. Since every member institution tracks statistics that are of particular value to them, it was difficult to ensure consistency in the kind of information that was available on the institutional side. The first assessment reports circulated in spring 2016.

The assessment plan for Ask a Librarian and *Clavardez avec nos Bibliothécaires* is currently being drafted. It will incorporate best practices from the virtual reference assessment literature, such as performing evaluations from a range of perspectives over the long-term, and going beyond the numbers by gathering qualitative information such as the motivations, opinions, and preferences of users.[32] These will help address the weaknesses in the chat services' current assessment practices, such as the lack of the librarian perspective, and an overreliance on usage statistics and exit survey responses.

Based on work performed by the OCUL-Scholars Portal committee, Scholars Portal staff have identified several areas of interest and potential challenges in terms of future evaluations of SFX. The need to balance the competing priorities of 21 different institutions of varying sizes and areas of focus will be a key consideration as staff begin to craft an assessment plan for SFX. This plan will build on the current practice of collecting usage statistics and complement it with regular feedback from staff at member libraries.

The case studies underscore the need to maintain communication, both with libraries and end users, especially for services in which there is little direct

interaction with the user base. Scholars Portal staff should be in continual contact with OCUL member libraries so that assessment practices reflect the priorities and goals of members. In order to collect qualitative information that can indicate the need for service improvements, it is also critical that Scholars Portal has open lines of communications with service users. This could be achieved by organizing focus groups or interviews, or by consulting with an advisory group, which ACE has done successfully. Staff at member libraries should also be encouraged to report qualitative user feedback they receive back to Scholars Portal.

Assessment planning should leverage the expertise of specialists. Ask a Librarian has had success partnering with assessment librarians at participating libraries to evaluate the satisfaction with Ask at that particular institution. This kind of collaboration helps open communication and reduces the impact on Scholars Portal staff capacity. The Ask model could be expanded, with Scholars Portal staff working with assessment librarians at multiple member institutions to evaluate the service as a whole, and could potentially be used to evaluate other Scholars Portal services, particularly SFX. Working across multiple institutions will also help balance the differing priorities of OCUL member libraries.

Finally, assessment plans should not be static. Once an assessment plan is put into place, it must adapt to the changing needs and priorities of member institutions. The assessment plans Scholars Portal staff create should be reviewed regularly, both internally and with the groups that help steer the directions of these services, such as the working groups for ACE and Ask a Librarian and the OCUL-Scholars Portal committee for SFX. Changes to the service, or changes in what members want to know about service effectiveness, would require a modification of the assessment plan.

Conclusion

Assessing the services provided by a library consortium is just as necessary as assessing services provided by individual institutions. However, the additional factors of an extra perspective (the library as client), the distance from end-users, and differences between the needs and priorities of different libraries can all contribute to making such assessment difficult. The solutions to these difficulties and ultimately the best practices for assessment can vary greatly between services. However, developing and maintaining proper assessment plans for each service, taking into account that service's stakeholders and specific value proposition, allows a certain level of consistency of assessment, ensuring that the consortium continues to meet the needs of its members and demonstrates the value that it provides to them.

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What Do We Collect and Why? Conducting a Self-Study to Improve Data Collection Practices

Summer Durrant and Suzanne Chase
University of Mary Washington, USA

Abstract

This paper describes a self-study the University of Mary Washington Libraries conducted to examine our data collection practices. A small working group was formed to interview all full-time library staff about the data they routinely gather and challenges they experience when collecting and using library data. The results were used to compile a data inventory spreadsheet that contains detailed information about 81 library metrics. The findings were also used to improve data collection practices in several key areas, including automating data collection that was previously gathered manually, simplifying data collection tools, and centralizing where data files are stored. Consequently, the libraries are now better positioned to make effective use of the data collected about our library resources and services.

Introduction

Academic libraries collect a tremendous amount of data about their resources and services; however, making effective use of these data can be challenging. One obstacle is that data collection responsibilities are often decentralized in libraries, making it difficult to know exactly what data are collected, who is responsible for collecting them, and how they are used. Further, data are stored in multiple places, including library systems, vendor administrative portals, shared storage spaces, and on individual staff computers. This can make locating data a complicated and time-consuming process. Lastly, making use of data requires specialized knowledge of data management, data analysis, and data visualization techniques and best practices, which are not skills librarians typically receive training in. These challenges are particularly acute for small academic libraries that often do not have a full-time position devoted to assessment activities.

This paper describes a self-study the University of Mary Washington (UMW) Libraries completed during the 2015–16 academic year to improve our data collection practices. The impetus for this project came after a daylong strategic planning retreat in which library staff expressed an interest in developing a better understanding of what data are collected and how they are used. Staff agreed that a holistic view of our data collection practices would help the libraries make better use of our data for decision making and reporting purposes. For this self-study, the libraries formed a small working group, the Data Collection & Analysis Team (DCAT), which included staff from different library departments (e.g., Access Services, Collection Services, Technical Services, Special Collections & University Archives) to ensure all perspectives were represented. The goals of the self-study were to: (1) compile an inventory of all library metrics collected by staff and systems, (2) devise and implement strategies to standardize and optimize our data collection methods, and (3) assist staff with analyzing data to make informed decisions and demonstrate impact.

Methodology/Approach

To examine our data collection practices, DCAT interviewed all 26 full-time library staff members. We developed a semi-structured questionnaire (see appendix) to ensure all staff members answered the same set of questions. The first part of the questionnaire solicited information about the types of data staff collect. Staff were asked to identify the data they are responsible for collecting, and to provide a brief description of the data, along with information on the collection method, storage and access location, frequency, and how the data are used (e.g., for reporting to external organizations). When possible, staff were asked to provide examples of the data, such as a spreadsheet or system-generated report. The second part of the questionnaire contained four questions that focused on specific challenges staff experience when collecting or using data. Lastly, staff were asked to reflect on how the libraries could improve our data collection practices. A separate interview, with

slightly modified questions, was conducted with the university librarian.

Information gathered from the first part of the questionnaire was compiled into a spreadsheet. We used the card sorting software, OptimalSort, to categorize the library metrics into functional areas. The final product, the data inventory spreadsheet, is discussed in more depth in the next section. Responses to the second part of the questionnaire, which focused on challenges staff face when collecting or analyzing data, were coded and analyzed in NVIVO. Key themes that emerged during staff interviews are discussed in the Staff Challenges section.

Data Inventory Spreadsheet

The data inventory spreadsheet contains detailed information about 81 library metrics. These metrics are organized into four broad functional areas: *staffing*, *expenditures*, *collections*, and *services*. Three of the functional areas are further subdivided: *expenditures* into *general*, *wages and salaries*, *collections*, and *other operating*; *collections* into *holdings*, *usage statistics*, and *collection maintenance*; and *services* into *information services*, *library spaces and equipment*, *collection services*, *discovery and access*, and *marketing and outreach*. Figure 1 shows the data inventory spreadsheet organized into functional areas.

Figure 1: Data inventory spreadsheet organized into functional areas

Library Metric	Brief Description	Library Unit	Collection Method	Data Source	Compiled	Purpose	Reporting
Staffing							
Expenditures							
General							
Wages & Salaries							
Collections							
Other Operating							
Collections							
Holdings							
Usage Statistics							
Collection Maintenance							
Services							
Information Services							
Library Spaces & Equipment							
Collection Services							
Discovery & Access							
Marketing & Outreach							

The spreadsheet has eight columns. The first column provides the name of the library metric followed by a column with a brief description adapted from the ANSI/NISO Z39.7-2013 Information Services and Use: Metrics and Statistics for Libraries and Information Providers—Data Dictionary[1] and the Project COUNTER Code of Practice.[2] The third column identifies the library department responsible for collecting the data. *Collection method* indicates whether the data are automatically captured in a system or manually collected by library staff. *Data source* provides the name of the system where the data are stored or the file format (e.g., Excel). The fifth column notes how often the data are aggregated, such as at the end of the fiscal year or academic semester. The final two columns describe how the data are used and whether they are reported to an external organization like ACRL or IPEDS. The *gate count* metric, for example, has a brief description of "total number of persons who physically enter the library." Access Services is the library unit responsible for collecting it. The data are collected manually in an Excel spreadsheet and compiled monthly as well as at the end of the fiscal year. The data are used for a variety of purposes, including making staffing decisions and demonstrating use of the physical library, and the metric is reported to ACRL. Figure 2 shows how the gate count metric appears in the data inventory spreadsheet.

Figure 2: Example of gate count metric from the data inventory spreadsheet

Library Metric	Brief Description	Library Unit	Collection Method	Data Source	Compiled	Purpose	Reporting
Services							
Library Spaces & Equipment							
Gate Count	Total number of persons who physically enter the library	Access Services	Manual	Excel	Monthly	External Reporting; Demonstrate Impact; Decision-Making	ACRL

A second spreadsheet was created to capture additional details about data collected manually in the library. This spreadsheet provides more in-depth information on a subset of 18 metrics, including the

collection method, file format, file location, history, and additional notes. Using the same example as above, the collection method for *gate count* is, "every morning a staff member records the gate count number on a paper calendar, which is later tabulated by month and fiscal year." The printed calendar is stored in a binder and eventually converted to an Excel spreadsheet that is stored on the libraries' shared network drive. The data are available from 1989 to present. Figure 3 shows the gate count metric as it appears in the second spreadsheet for manually collected data.

Figure 3: Example of gate count metric on second spreadsheet for manually collected data

Library Metric	Collection Method	Format	File Location	History	Notes
Access Services					
Gate Count	Every morning a staff member records the gate count number on a paper calendar, which is later tabulated by month and fiscal year	Paper Binder; Excel	N:\Public\Circulation\Circulation\Patron Counts	1989-present	The printed calendar is stored in a binder and eventually converted to an Excel spreadsheet

Staff Challenges

Examining the responses to the second part of the questionnaire, which focused on staff challenges to collecting and using data, revealed three main sources of frustration. First, many staff indicated that while they routinely collect data, they were unsure of how (or if) the data are used. Thus, there seemed to be a disconnect between staff collecting data and understanding how the data are used for making decisions or demonstrating the value of the library. Several staff also noted that they were unsure whether they should continue gathering data that had not been requested in a long time. Additionally, staff expressed an interest in knowing more about what data are reported to external organizations like ACRL or IPEDS. This feedback helped DCAT recognize that staff needed a clear sense of purpose for collecting data. They also wanted guidance on when it was appropriate to stop gathering data that was no longer relevant.

A second source of frustration was that staff felt uncertain about how to accurately record certain data. The most often-cited example was reference transactions. Since the libraries did not have an established procedure for recording reference transactions, each staff member entered the information slightly differently, making the entire dataset less reliable. Additionally, over time, the online form for capturing reference transactions became unwieldly with new questions, response categories, and tags added on an ad hoc basis. As a result, the form was tedious to complete and distinguishing between options was not always straightforward. After consulting with staff, DCAT decided that it would be beneficial to bring together all staff members who use the entry form to agree on a common definition for reference transactions and find ways to streamline the form.

Lastly, all staff reported that finding library data was an onerous process. The first barrier was knowing whether the information was even available. Since (at the time) the libraries did not have a data inventory to consult, it was not always clear whether the information was being captured by a staff member, system, or vendor. A second barrier was locating the data. Library data are stored in many different places, including library systems, vendor administrative portals, various folders on the libraries' shared drive, and even on individual staff computers. This made accessing the data difficult since it was not necessarily obvious where to look; it also raised concerns about the long-term availability of data, especially those stored on staff computers. From these conversations, DCAT learned that staff wanted a single storage solution—a data warehouse—where all library data could be housed and easily queried. Further, staff wanted frequently requested statistics, like gate count and circulation, to be compiled on a regular basis so that it would be easy to retrieve the information without having to run a report.

Outcomes

DCAT has used the findings of this self-study to improve the libraries' data collection practices in numerous ways. One immediate application was to use the data inventory spreadsheet to convey information about the purpose of each library metric. The data inventory spreadsheet contains a column for *purpose* that indicates how the data are used. For each metric, one or more of the following categories are selected: (1) external reporting, (2) decision making, (3) demonstrating impact, (4) internal record keeping, or (5) quality assurance. An additional column, *reporting*, was created to list the names of external organizations the aggregated data are reported to (e.g., ACRL, Petersons, Wintergreen Orchard House). Including this information on the data inventory spreadsheet has provided staff with

a clearer sense of how data are used in the libraries. In some cases, it has also helped staff decide to stop collecting data that was no longer relevant.

Another outcome was improving how reference transactions are captured. As discussed earlier, many staff felt uncertain about how to correctly record this information. To address this concern, DCAT hosted a half-day meeting in which staff agreed on a standard process for collecting reference transactions. The first part of the meeting focused on adopting a common definition for reference transactions using the ANSI/NISO Z39.7-2013 Data Dictionary. Next, we discussed ways to streamline the online form to include only information that was needed for external reporting or internal decision making and quality assurance purposes. In the end, a number of response categories were eliminated, which greatly simplified the form. These changes were put into effect on July 1, 2016 to coincide with the start of the FY17 data collection cycle.

Near the completion of the self-study, the libraries began implementing a new integrated library system (ILS). Alma, the new ILS, has sophisticated built-in data gathering and analysis tools that have enabled more automated collection of data that has been difficult to capture in the past. For example, Alma is able to harvest e-resource usage statistics using the SUSHI protocol. Staff have also automated data collection for book repair statistics and in-house use of print serials in Alma. The move to a next-generation ILS has enabled the libraries to move closer to our goal of a central data warehouse; however, a large amount of data still resides outside of Alma. While it is unlikely that we will implement a solution that pulls together data from all of our disparate data sources like Google Analytics, Gimlet, Springshare, and others, DCAT is exploring how to best organize data files that are not housed within a system, but are stored as individual Excel files.

Throughout the process of conducting staff interviews, DCAT members were able to observe how staff collect data. This led to opportunities to propose new methods for gathering data that improved quality and reduced staff time. One example is public computer usage statistics. Prior to the project, reference librarians counted the number of individuals using public computers each hour and recorded the information in an Excel spreadsheet. Instead, DCAT recommended the libraries use LabStats, a commercial software product licensed by the IT department that tracks computer lab usage. The transition to LabStats has not only freed up staff time, but has also provided more detailed information about how our public computers are used. Finally, during staff interviews, DCAT members became aware that many staff were unfamiliar with how to run reports in library systems to retrieve information they needed. As a result, DCAT has started to offer a consultation service in which staff can meet with the group for advice on optimizing their data collection methods. DCAT has also begun provided training sessions on how to create reports in various library systems.

Conclusion

Completing a self-study of the libraries data collection practices was a beneficial process. In particular, the data inventory spreadsheet provided the libraries with a better understanding of the data staff routinely collect, where the data are stored, and how they are used. Responses to the second part of the questionnaire highlighted common challenges staff experience when collecting and using library data. The findings of this project have been used to improve data collection practices in numerous ways, including automating more of our data collection efforts, organizing where data are stored, and providing staff with training on how to retrieve data from library systems. Consequently, the libraries are now better positioned to use data to make more informed decisions about library resources and services, and demonstrate our value to the wider UMW community.

Endnotes

1. NISO, "ANSI/NISO Z39.7-2013, Information Services and Use: Metrics & Statistics for Libraries and Information Providers—Data Dictionary," *National Information Standards Organization*, 2013, http://z39-7.niso.org.

2. Project COUNTER, "The COUNTER Code of Practice," *Project COUNTER*, 2014, https://www.projectcounter.org/code-of-practice-sections/general-information.

Appendix

Staff Semi-Structured Interview

1. **Can you provide us with an overview of the types of data or usage statistics your service area collects?** Take notes on each item and follow up to find out:

    a. **Description**—what information is being collected? (e.g., library website traffic, ILL requests)

    b. **Collection Method**—how is the information collected? We want to know if the information is manually recorded (entered into a spreadsheet, document, online form, etc.) or automatically captured by a system like Virtua, ILLiad, Springshare, or Google Analytics.

    c. **Storage/Access**—details about where the information is stored or accessible. Does the information reside on a server that can be queried as needed, or is it stored as a spreadsheet, document, or other format? Where are the paper or electronic files located?

    d. **Frequency**—how often is this information captured or compiled? Examples include daily, monthly, quarterly, annually, or occasionally.

    e. **Outcome**—what is the importance of this information and how is it used? For example, usage data may be used to support resource renewal or cancellation decisions. Also, some data may need to be reported to external organizations like ACRL.

2. **What are some of the challenges you've experienced with collecting data or being able to use data to make decisions or demonstrate impact?**

3. **Are there other kinds of data or statistical information you wish we collected or had access to?**

4. **What data do you think we could stop collecting? Why?**

5. **Do you have any suggestions or comments you'd like to share with the Data Gathering Group?**

Using a Tool to Build a Culture of Assessment: The Data Framework

Ashley Hall and Starr Hoffman
University of Nevada, Las Vegas, USA

Abstract

Academic libraries capture and report vast quantities of data; thus, keeping track of what needs to be gathered, how, when, and by whom is not a simple endeavor. The University of Nevada, Las Vegas (UNLV) Libraries first developed a data framework over a decade ago to track data points that were required to be collected and reported. Since data use at the libraries has grown exponentially, a major revision and reconfiguration was necessary.

The UNLV Libraries approached the revision project systematically, carefully investigating existing and missing data and reporting deadlines and other data collection factors. Creating a data framework model was an essential step in the revision process. This model served as a guide in creating and updating what data is collected (data points and definitions), who provides the data (hierarchy of data providers), how they collect it (step-by-step procedures), how often it is reported, its purpose, and identifying who needs the data (data requesters). This model allowed library faculty and staff to more fully understand the complex process of collecting accurate data. The end result is a data framework that emphasizes the purpose of data points and ensures that data is consistently checked for use and meaning, further growing assessment—not rote data collection—as an institutional value.

Introduction: The Data Matrix

In 2007, as external and internal data collection requirements expanded, the dean of the UNLV Libraries and the head of assessment decided to document the UNLV Libraries' data collection activities. The resulting data matrix (later renamed the data framework) outlined what data was collected, where that data was reported, who requested it, how often it was collected and reported, and who was responsible for reporting it. The data matrix was a useful administrative tool and information source for the dean and the head of assessment, organizing and streamlining the data collection process. Over time, maintenance of the matrix lagged partly due to other projects taking precedence, and also because it was used by few in the organization. In 2014 a new library data analyst was hired and tasked with updating the data matrix. Soon after, a Data Matrix Advisory Group was charged with defining the challenges with the current tool, determining data needs, and mapping out the data matrix revision process.

Related to this revision process, the data analyst was tasked with helping to foster a culture of assessment within the UNLV Libraries. The assessment unit, in conjunction with the dean and other library department heads, decided that the data matrix update could build a sense of ownership for the data collection process across the libraries. The data matrix update project evolved beyond updating a document; it became a journey to create a data framework that would guide the UNLV Libraries in the management of its data.

Vision for the New Data Matrix

Rethinking the data matrix was an efficient means for the data analyst to accomplish her two primary goals: updating the existing data matrix and growing the culture of assessment at the UNLV Libraries. In this organization, there has long been a respect for data-driven decision making. However, the assessment unit primarily managed the data collection process, and thus individual departments did not always understand the purpose of and many potential uses for the data they collected. In order to foster a healthy culture of assessment, it was important to actively involve everyone in the data collection and reporting process—including those who collect data (data providers), those who supervise data providers, and decision makers.

In order to encourage a sense of data ownership at all library levels, the newly formed Data Matrix Advisory Group envisioned a new tool to replace the data matrix. This tool would need to be more intuitive and feature-rich, thus encouraging consistent use. This consistent use and reliance upon

the tool would provide an incentive for keeping it updated.

Evaluating the Original Data Matrix

At the beginning of the update project, the advisory group identified challenges with the data matrix. First, staff thought of the data matrix as a tool that collected and/or reported data, rather than a manual that explained the data collection process. Second, despite the data matrix's list of data points gathered, staff turnover left many faculty and staff confused about what data was collected, how it was collected, when to do so, and why. The data matrix was also outdated, listing data points that were no longer gathered, or for which the metrics or collection procedures had changed. Finally, departmental-level data points (used for internal department purposes) were omitted because of the matrix's original role as an administrative tool. Thus, the data matrix was incomplete as a record of the institutional memory of data gathering. It would need to be expanded to fulfill its new purpose of growing the culture of assessment within the libraries.

A related issue with the data matrix, after this new vision for the tool was developed, was its name. The tool was originally named the data matrix because it was presented as a matrix (information arranged in rows and columns). This concept no longer applied to a tool that the libraries would use to map out data collection and reporting, to train new staff, and to use as a guide for procedural work to ensure the consistency of data collection. The new name selected was the data framework, reflecting that this tool would act as a foundational supporting structure for the organization's data collection and reporting process.

Finally, the data framework's original spreadsheet format was not conducive to its new role as a training and reference tool. Challenges associated with navigating the original framework included difficulty producing a list of data points for which a specific person was responsible. This was due, in part, to the spreadsheet's limited filtering capabilities. Thus, the libraries needed to select a new format for this tool.

Revision Process

Once these challenges were identified, updating the data framework began with a series of meetings between the assessment unit and each library department. After the advisory group outlined an initial plan and schedule, the data analyst drove these exploratory meetings through a series of prompts and questions, including: what data does your department currently collect, for what purpose is that data collected (how is it used), what data would your department like to collect (but currently is not), how do you feel about the data collection process as it stands, and how can the assessment unit help you use data to more effectively tell your departmental story? The data analyst also encouraged an exploration of how data could be used not only for mandatory external reports but also for internal decision making and improvements.

Based on information collected in these meetings, a rough plan for the update project was laid out which included:

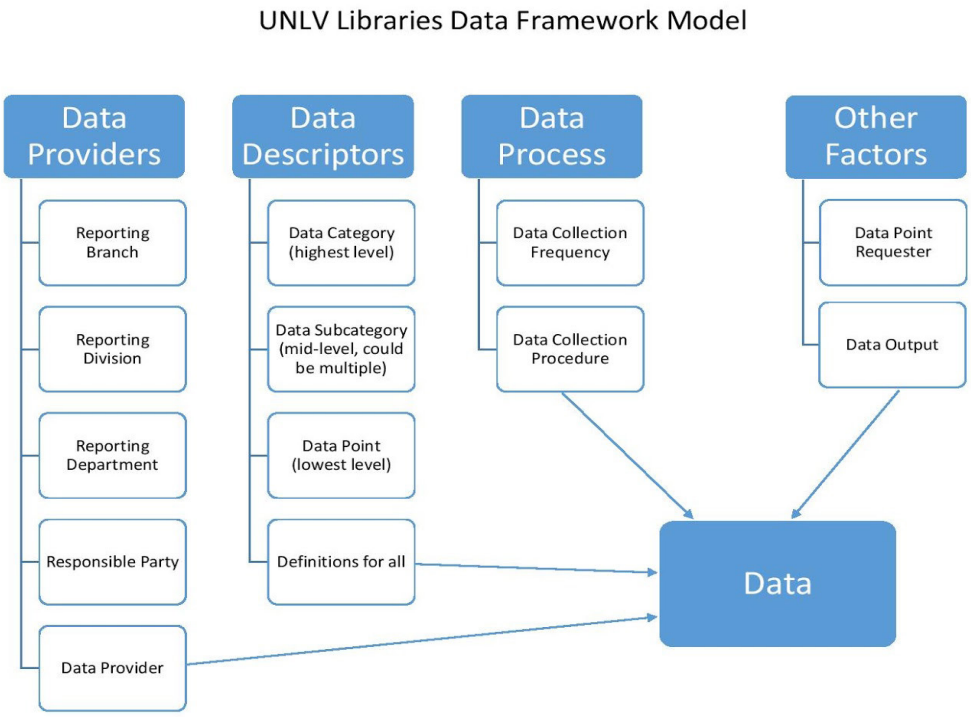
1. describing the purpose and intent of the data framework to staff,
2. identifying missing or outdated data points within the current framework,
3. identifying problems with the current data framework via staff input (and suggesting improvements),
4. developing a model to update the new data framework,
5. designing and developing the new data framework interface,
6. training on the use of the new tool, and
7. sharing the tool via an easily accessible platform.

Describing Purpose. Describing the purpose of the data framework was an essential step. The assessment unit communicated its vision of maintaining data consistency and accuracy, preserving institutional memory of data gathering, and ensuring that all data is collected for a purpose. As a result, department heads gained enthusiasm and a sense of ownership for the update project.

Missing or Outdated Data. Some missing data points were easy to identify, such as those required by ACRL (Association of College and Research Libraries) or NCES' IPEDS (the National Center for Education Statistics' Integrated Postsecondary Education Data System). Other missing data points, including data collected by departments for their internal use (not centrally reported to the assessment unit) and data that was not collected at all (but could be), were more difficult to organize. A series of meetings with each department was required to identify: (1) what is collected now, (2) what should be collected but is not, and (3) what the organization would like to collect (but is not currently feasible).

This phase of the revision process was the most effective in fostering a culture of assessment. The assessment unit was able to define and describe not only the framework, but also the many possible uses of the data collected throughout the organization. Conversations with data providers led to a better understanding both of how their data was currently used by the broader organization, as well as the many potential uses of the data in their own work, including annual reports, sharing project accomplishments with the community, and telling their story. This led to excitement about the many possibilities of their data, transforming data collection from a mandatory activity to a meaningful and mutually beneficial practice.

The Data Framework Model. While considerable literature and examples exist for the research data lifecycle, few examples were available for how organizations arrive at a specific piece of data (what the assessment unit defined as a "data point"). A model was needed to understand how data is generated across the organization. The UNLV Libraries created a data framework model that outlined elements related to data collection (Figure 1).



In this model, the UNLV Libraries outline four important considerations (or factors) that had to be considered for each piece of data collected: data providers, data descriptors, data process, and other factors. As outlined in Figure 1, each factor includes additional elements that help clarify what is essential to data collection. Definitions for the factors and elements appear below.

Data Providers: This factor describes the person who reports a data point, and all elements related to them, including: the reporting branch (physical library location), reporting division (the highest level in the libraries' organizational hierarchy), reporting department (the next level in the organization), responsible party (the position ultimately responsible for ensuring that data points in their area are recorded—this is usually the supervisor of

the data provider), and the data provider (the person responsible for reporting specific data points).

Data Descriptors: This factor describes the various categories that the data point belongs to, as well as detailed definitions of each. The specific elements include: data category (this is the highest level and indicates the kind of data—for instance, collections, expenditures, etc.), data subcategory (further separates the broad data category; each data point could have multiple subcategories, for instance: collections > digital and electronic collections (subcategory 1) > e-books (subcategory 2)), data point (this describes the data that is collected; for instance, in the previous example of e-books, a data point might be the count of e-books), and definitions (definitions are provided not only for each data point but also for each category and subcategory).

Data Process: this describes the act of collecting data, including data collection frequency (how often the data is collected), and data collection procedure (describes the reports or queries or other collection methods used to obtain the data).

Other factors include data point requester (the person or entity requesting the data—may be an external agency or an internal stakeholder) and data output (a specific report or publication using that data, such as the ACRL Academic Library Trends and Statistics Survey or a departmental report). This factor could be expanded to include additional elements as needed.

Design and Development. Designing and developing the data framework consisted of several draft versions that had to be vetted. The goal was to design a simple and clear interface, as the tool needed to be intuitive to encourage use. The assessment unit decided to store the descriptive elements of the framework in an Excel spreadsheet and to display that information in a Tableau-driven user interface (data visualization software). The Excel back-end consists of over 700 rows and over a dozen columns of descriptive elements, which is difficult for users to navigate. Separating the actual framework information from the user interface ensured that the framework elements remained static (and protected from unintended changes) in the back-end, while users only interacted with the front-end Tableau interface.

The end result is a Tableau interface that displays the basic framework elements in a dashboard. The main body of the dashboard only shows data categories and data points, while descriptive information, such as division, data providers, data requester and department (among others) is presented via small dropdown filters. The expanded data definitions and data collection procedures had to be displayed to users simply, rather than cluttering the framework view with an overwhelming amount of information. To accomplish this, the definitions and procedures were placed on a separate dashboard, accessed via the data points (through hyperlinks). To read definitions or procedures, a user need only click on a data point to be taken to a definitions dashboard that displays only the definitions and procedures of the data point they clicked on. Due to this change, the framework is a streamlined interface and a much more usable tool, as it allows users to customize their view via filters and definitions, to match their specific needs.

Sharing and Training. A beta version of the data framework tool was shared with the libraries via a presentation and a downloadable file that allowed staff to test out the design. The draft was considered a success, as most staff members were able to intuitively navigate the tool without significant problems.

Next Steps

Now that the data framework is nearly complete and the beta release is available to library faculty and staff, the next steps include expanding staff training. The data framework is accessible to staff through two methods. First, those with Tableau Server accounts can log in online and use a continuously updated version of the tool. This provides fast, easy access without the hassle of downloading files or updating software. Second, everyone can download the most up-to-date version of the data framework from the internal staff website, which also provides a link to the free Tableau Reader software.

Training for faculty and staff has begun and will continue as new staff are on-boarded. The most crucial step in training has proven to be defining the tool—clarifying that it is a data dictionary, not a data collection tool. Our goal with this training is not only to promote regular use of the tool, but also to prepare staff for a shorter annual revision process so that procedures are updated regularly. Training also includes instruction on how to use the tool when

reporting data to the assessment unit or elsewhere, and emphasizes its importance for preserving institutional memory about the data that we collect. The data framework is a crucial tool for training new faculty and staff on data collection procedures, and for ensuring that when staff retire or move on, that their knowledge is preserved.

End Result

The revised data framework enables the UNLV Libraries staff to provide clean, accurate, and consistent data. The content and format of the framework allows staff to deepen their understanding of the data they provide, creating a sense of staff ownership for data collection. Illustrating data use throughout the organization (from the internal departmental level, to administrative needs, to external reporting) contextualizes data collection and helps foster a culture of assessment. The expanded data framework emphasizes the purpose of data points and ensures that data is consistently checked for use and meaning, further growing assessment—not rote data collection—as an institutional value.

All Your Data Displayed in One Place: Preliminary Research and Planning for a Library Assessment Dashboard and Toolkit

Megan Hurst and Christine Madsen
Athenaeum21, UK and USA

Frankie Wilson
University of Oxford, UK

MacKenzie Smith and William F. Garrity
University of California, Davis, USA

Abstract

The article presents the results of a 2016 multi-institutional, international research and scoping study to define the nature and feasibility of a library assessment executive dashboard and toolkit to enable libraries to centralize diverse collection, usage, administrative, and financial data, and to more easily visualize, analyze, and utilize the data. The study investigated the need and high-level requirements for a toolkit to enable library administrators to utilize commonly shared performance indicators and formulas to create their own dashboards, and the ability to customize indicators and formulas as needed. The article discusses research methodology and library management questions that might be more easily answered with a shared framework for key library performance indicators and library data sources, and an analysis of the current technology landscape and commercial and open source tools to support such a dashboard. Study findings and recommendations for next steps to develop a library assessment dashboard and toolkit are contextualized within the current library assessment and technology landscapes.

From January to June 2016, University of California, Davis and Athenaeum21 Consulting, with collaborators at University of Oxford in the UK and Göttingen State and University Library in Germany, engaged in scoping research to determine the nature and feasibility of a "library assessment dashboard toolkit." Funded by the Andrew W. Mellon Foundation, the purpose of the project was to validate the need, to identify user requirements, and to scope resources needed to design and build the toolkit and dashboard. There have been many important, specialized efforts over the years to collect and standardize library data (including the Association of Research Libraries' (ARL's) Annual Statistics,[1] LibQUAL,[2] and Measuring the Impact of Networked Electronic Services (MINES);[3] California Digital Library's Journal Value Metrics;[4] Project COUNTER;[5] International Standard Organization's standard 11620:2014 of Library Performance Indicators;[6] Ithaka S&R;[7] the UK's Library Analytics and Metrics Project (LAMP);[8] Germany's Library Index (BIX);[9] the Public Library Association's Project Outcome;[10] Society of College, National and University Libraries (SCONUL) Statistics Reports;[11] the National Information Standards Organization's Standardized Usage Statistics Harvesting Iniatiative (SUSHI);[12] Australia's Wollongong Library Cube;[13] as well as proprietary library collections data analytics tools, such as SpringShare's LibAnalytics;[14] OCLC's GreenGlass;[15] and OrangeBoy's demographic data dashboard, Savannah[16]). Our research builds upon these efforts by investigating the appetite and need for a toolkit to enable libraries to centralize these and other data sources, and a dashboard to more easily visualize, analyze, and utilize the data. Standardizing and collocating such data would give library leaders views of data, patterns, and trends for their libraries that were previously unavailable (or, at best scattered), and so help them better plan for the future in an increasingly complex landscape.

Methodology

The research team started by compiling their own institutions' assessment needs and performance

indicators, followed by compiling an inventory of recent and current projects and initiatives at research libraries worldwide that are addressing the problem of library data and assessment. These efforts were followed by survey questions circulated to the ARL-ASSESS and LIBER listserv communities and by interviews with individuals deeply engaged with assessment at the following institutions:

- Charlotte-Mecklenberg Public Library, North Carolina (US)
- Duke University (US)
- Harvey Mudd College (US)
- Jisc (UK)
- Syracuse University (US)
- University of Pennsylvania (US)
- Wollongong University (Australia)
- Yale University (US)

Participants were interviewed about the current status of, or plans for, assessment in their organizations, as well as key management and strategic questions to which library managers and executives want answers.

Deliverables

Outcomes of this scoping research included:

- A **draft framework** for mapping relationships among data sources, metrics, strategic and managerial questions, and service areas in libraries
- A detailed **data inventory** elaborating the common data sources available to libraries and the disparities among data sources across institutions
- A **tools inventory** summarizing the most commonly available tools for business intelligence, data warehousing, library assessment, and data visualization in academic research libraries
- A **requirements document**, outlining user needs for a library data warehouse and dashboard toolkit
- **User needs interviews**, investigating potential typical users and their immediate and future needs
- A preliminary concept for the **user interface of the dashboard** based on the draft framework
- A detailed **project implementation plan** including timeline and resource estimates for implementation of a dashboard and toolkit

Findings

Our literature reviews, research and interviews suggest that the majority of library managers approach assessment and evaluation in an ad hoc and reactive manner as pressing questions arise. Managers spend their valuable time manually collecting, cleaning, and normalizing data from diverse systems, and then perform one-time or static interpretations. The library managers that we interviewed felt that a toolkit and dashboard could free them to probe and interpret more data, think more strategically, and develop more meaningful questions about measuring and evaluating library performance.

The research team found that not only is there a need for the development of a toolkit and dashboard, the general approach represented by a toolkit and dashboard resonated with the community. Notably, it was clear from both the interviews and queries to relevant listservs that:

- Library managers and leaders agree on the need for a set of assessment tools and standards, ideally including capability to share and compare data across institutions.
- In some cases, current needs are partially met by an ad hoc set of existing tools, sometimes via the library itself and at other times via access to institution-wide business intelligence (BI) tools.
- Access to tools and standards is inconsistent among libraries, with some libraries having access to Tableau[17] for visualizing data, but few having access to the technical infrastructure to support a dashboard and even fewer having the technical and staff resources to assemble the necessary components that would allow them to make use of their data effectively and consistently.
- Even in cases where libraries have access to institution-wide BI solutions, these solutions may not be appropriate for their specific needs and often need to be customized.
- The majority of assessment librarians' time is currently spent reacting to ad hoc, often unanticipated requests, and manually normalizing and transforming the needed data. It was apparent from the interviews that libraries are striving for a systematic and regular approach to assessment data, but such an approach is not on the discernible horizon for the vast majority. As one interviewee said, "The holy grail for me is: 1) Present plan, 2) report on cost, 3) identify outcomes." The reality, however, is that most assessment activities are

reactionary: "Everything we're doing now is done on a question/answer basis."
- Many groups (including LAMP in the UK,[18] ISO standards for Library Performance Indicators,[19] and the University of Pennsylvania's MetriDoc data warehousing solution[20]) have made significant efforts addressing aspects of end-to-end library assessment solutions or frameworks, but these solutions have not seen widespread adoption within the library community, and each solution offers just one facet of what could be a comprehensive, systematic solution for libraries.
- The most sophisticated efforts that we encountered in the domain of aggregating and presenting data to assess library performance emerged out of funding and budget crises requiring justification of return on investment to restore funding (namely, the Charlotte-Mecklenberg Public Library in North Carolina), or from reporting mandates tied to government legislation (to which Jisc and the Higher Education Statistical Association's (HESA's) HEIDI plus initiative[21] respond in the UK).

The current state of the use of assessment tools at the libraries we interviewed, and those in our literature review, is inconsistent; our findings indicated that the need and desire for a standard toolkit is both common and urgent. As one interviewee said, "I think we will always have more complex, deep questions than a dashboard like this would answer, but having the dashboard would enable us to spend less time on getting answers to basic questions, and spend more time on the complex, deep questions."

Our research and interviews also suggested that library leaders are looking for answers to many of the same questions. The most common questions were the following (in the words of the interview respondents):
- Usage/Impact
  - Who is not using the Library—is there a pattern in time or across demographics?
  - Conversely, who is using the library, and what are the usage patterns?
  - How effective are our promotional activities?
  - Are the right demographic groups using the right resources?
  - How does library usage benefit clients?
- Collections
  - Are we buying the right resources?
  - Are the items we are buying being used?
  - What is the overall cost per use of electronic versus print materials?
  - How many reproduction requests are we getting?
  - Are we getting ILL requests for items we already own? Is it because items are not being found via our systems, or because they are not available? If they are not available, are there ways we can make items more quickly available?
  - Does it make sense to lease or borrow, versus purchase?
  - How does time-sensitivity of fulfillment of requested item factor into the equation?
- Work Rate and Project Management
  - How quickly is our backlog growing?
  - How long did a specific project take and what was the breakdown of resources: costs for hardware, software, staff resources?
  - What is work volume by time of day, day of the week, and time of semester across multiple work areas/functions (e.g., circulation, technical services, reference desk, research consultations, and instructional sessions)?
  - What is the staff time and cost per project?
- Physical Space
  - How is our physical space being used, by whom and when?
  - How many people are in our reading room(s) on average?
  - How frequently are our on-site print collections being used?
  - Does frequency of use justify in-library location, or should certain print items be stored off-site?
- Financial
  - How are we spending our budget? What is the allocation, for example, between application developers and purchased discovery services?

The commonality of the questions, in conjunction with the desire to compare data across institutions, indicate that some effort may profitably be put to utilizing, and potentially expanding upon existing library key performance indicators (KPIs)[22] and defined data sources in an integrated framework that "maps" those KPIs to the library data sources required to calculate performance. With the right set of questions, identified and agreed to by a community of users, the framework could provide an overall picture of activities in a library sufficient to

make many decisions about resource allocation. In the longer term, providing such a foundation would also enable libraries to more effectively demonstrate their contribution towards their parent institutions' teaching, learning, and research missions.

Other important findings of this scoping research include an understanding of how to prioritize access to "live data." That is, how important is it to update data on a live basis—say, hourly or daily? What is the preferred frequency to update data? The research team found that for the interviewed library managers and executives, real-time live data is not currently a high priority. While BI dashboards classically focus on live operational data, it was clear that in most cases quarterly updates would be fine and, in some cases, annual updates are sufficient. This preference would have the effect of lowering the costs of building and maintaining the toolkit as it will not need to account for live connections to all data sources. We anticipate, however, based on the responses of the more sophisticated assessment efforts (chiefly Charlotte-Mecklenberg Public Library), that as quarterly and monthly data are normalized and utilized in a dashboard, the demand will likely increase for live data as new questions emerge.

Based on our research and interviews, the proposed toolkit would require the following elements:

- Key library performance indicators and supporting data formulas
- Library data inventory
- Library data dictionary
- Data normalization script library
- Customizable web browser-based dashboard with data visualization modules of key library performance indicators
- Recommendations and case studies for open data warehousing solutions
- Establishment of a membership consortium and online community to enable the adoption and support long-term sustainability of the toolkit and dashboard

Proposed Approach and Path Forward for the Development of a Library Assessment Dashboard and Toolkit

The final output of this scoping research is a detailed, proposed model plan, with costs, to develop the dashboard and toolkit and deploy them across the academic library community. We estimate that a full toolkit and dashboard could be accomplished over three years. The proposed project plan incorporates recommendations and tools for the technical support of data aggregation and normalization, efforts that are currently significant obstacles to libraries' assessment efforts.

Additionally, based on the research team's experience and observation of particularly robust, successful cross-institutional initiatives that have achieved sustainability and widespread adoption by the academic and research library community, the plan includes the establishment of an open online community and membership consortium.

We preliminarily estimate that such an approach to the effort would take approximately three years, with the work comprising the following elements:

1. Framework, Data Model, and UI Dashboard
2. Technical Infrastructure
3. Project Management/Collaboration/ Communications
4. Community Engagement/Sustainability

Our research has uncovered that the possible technical approaches to collecting, hosting, and managing data sources are varied and divergent, particularly in light of cloud-based solutions for managing data that provide alternatives to more traditional data warehousing approaches. Broader institutional learning assessment initiatives in institutions of higher education in the US and Europe that are in early stages of development may reveal advantages and disadvantages of various potential technical approaches within the next six to eighteen months.

An immediate first step towards the development of the toolkit and dashboard would be technical assessment of the feasibility and costs associated with open data warehousing solutions. Deeper research into the emerging technical approaches is needed before more precise development time and cost estimates can be made for the technical infrastructural components of the dashboard. However, work towards fully developing the framework and data dictionary, with real library data sources, can be undertaken in the near-term with potentially great benefit to participating libraries.

Additionally, our conclusion from our investigations and interviews is that while there is need for such a conceptual framework and supporting technical infrastructure, there is limited capacity and expertise

to develop them at the individual institutional level. Since one long-term goal identified is for institutions to share and benchmark data with one another, we foresee that an established, credible organization (or organizations) that can or already do manage the collection and sharing of data across individual institutions would be ideally situated to sponsor the development of the toolkit, dashboard, supporting technical infrastructure, and user community. Ideal entities would include mission-based, not-for-profit organizations with established credibility in the library assessment community, a focus on the success of libraries, and capability of innovating, taking risks, and leveraging technology. While the scoping research focused mainly on the performance of research libraries, the proposed toolkit and dashboard framework could be adopted and customized by any type of library, including smaller college and university libraries, community college libraries, and public libraries. Institutionalizing the project through sponsorship by an appropriate body or syndicate of libraries would help assure its extensibility nationally and internationally.

Conclusion

The research and scoping study confirmed the appetite and need for a library assessment dashboard and toolkit enabling libraries to better visualize their performance and manage their resources. The proposed toolkit and dashboard would build upon the aforementioned preceding library assessment efforts internationally. The proposed project diverges from these important efforts and tools, however, in that it would provide an "end-to-end," comprehensive framework that connects library key performance indicators with the full range of library data sources—from operational and financial data to collection management and usage data.

Ultimately, this type of infrastructure would allow library leaders to more easily and quickly understand the most important information they need, including efficiency of provision of goods and services, value for money, customer satisfaction, and the real costs of goods and services in their libraries. We envision a basic, ideally open source software-based "dashboard" with modules for standard data sources. By standardizing approaches to existing data sources with a toolkit, data can more easily be compared among institutions. While focused on research libraries, we anticipate that the dashboard and toolkit would be of interest and benefit to libraries of all types.

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Do We Collect That Information and If So, How Can I Access It? Designing a Statistics Depository

Michael Perry and Gina Petersen
Northwestern University, USA

Introduction

In the fall of 2015, Northwestern University Libraries restructured. The goals of the structure change included empowering frontline staff to make operational decisions and allowing administrators to spend more time focusing on strategic issues. Of course, all organizations require data in order to make strategic and operational choices; Northwestern University Libraries now had a renewed vigor for needing staff throughout the organization to access the information required to make the best decisions.

The library assessment specialist and the head of assessment and planning worked together to first understand the statistical and data landscape of the organization and then to facilitate access to and comprehension of this information. This paper outlines the process taken by the authors to conduct a data audit and create an infrastructure for storing and facilitating access to information.

Rationale

Aside from being new to their roles, the authors saw two principal reasons that an audit of data collection was needed: the decentralization of information collection and storage and a lack of knowledge regarding which people were responsible for which pieces of information.

Data collection and analysis does, and the authors believe should, occur throughout the organization. However, the authors wondered if there was duplication of effort. Are units A and B both pulling the same metric and if so, are they getting the same result? Northwestern University Libraries has a long-standing culture of democratizing information by giving many staff members access to the reporting features of products, such as LibAnalytics and Alma. Within such systems, it is important that the criteria for the reports are correct. For example, contrary to what may be intuitive, in-house uses must be manually excluded from reports of circulation numbers, as they are considered a type of circulation within the ILS. If unit A correctly excludes in-house uses and unit B does not, competing circulation numbers about the same collection could be disseminated throughout the organization.

Further, once information is generated, the authors wondered how it was stored. Do final fiscal year numbers live primarily in annual reports? Is it easy to compare changes year to year? Is the raw data stored in file formats and directories that allow others to access said information?

The decentralization of information collection also facilitated another problem; there was no good way to learn who the best person was to ask to generate a specific piece of information. The authors saw a need for a list of point people for various types of data. Frequently there would be an e-mail message sent to all supervisors asking who has data about headcounts in a specific space or computer use during interim periods. There was a need to describe what information is being collected where and ensure that the data is stored such that more than a single person has access to it.

After mining annual reports for specific pieces of data, the authors knew a lot of the information that was being collected and by whom, but realized that other pieces of data, which described operations and could inform decision making, did not rise to the level of being included in annual reports.

After considering these issues, the authors decided that they needed the help of others in order to conduct a more complete data audit and outlined four project goals for the data audit:

- To understand who was collecting data where and ensure that effort was not being duplicated.
- To clearly delineate who was responsible for collecting data within the library, which, in turn, will make it clear who the point person was for each piece of data.

- To develop and implement a central depository location. This, in turn, would make access to some pieces of data easier. Further, the authors hoped that by being able to analyze data side-by-side, additional insights could be developed.
- To establish a community of practice regarding data and its stewardship and analysis.

Process

The authors drafted, piloted, and distributed a data stewardship form. The form was distributed to all supervisors, who were asked to record information about the data their department compiled, generated, and kept. The criteria for submission included that the data: be generated by library or user workflows, be used for planning purposes, or be included in annual reports and statistics. For each piece of data the form asks for a name and description of the data, the system from which the data is generated, the schedule for compiling/pulling data, the file type(s) of the reports, the department responsible for the data, whether the data contained personally identifiable information, and where the data is stored. The full text of the form is available in Appendix A.

The authors received 55 submissions to the form. A small subset of the Library Assessment Committee reviewed all submissions while considering the following questions:

- Is the information clear?
- Is the response correctly coded for personally identifiable information?
- Does the record contain multiple data sources that need to be split up?
- Does there appear to be any missing information?
- Does this data appear useful for further analysis (such as meta-analysis, visualizations, etc.)?

Challenges

Upon first review, the data submitted provided a number of challenges. First, it was unclear who this information should go to. Some responses were clearly handled by supervisors while other departments had spread data collection and reporting among a number of different staff members. Additionally, the relationship between library administration and the collection of data seemed to vary based on the data source in question. Bringing together the analysis and creating more formalized processes would require communication at all levels across the organization.

As the analysis of the responses continued, it also became clear that Northwestern University Libraries were collecting a variety of data that often did not have a clear upstream purpose. We were often collecting data that did not appear immediately useful, sometimes based only on the idea that it might someday be useful. This seemed to also impact buy-in for more established data collection methods as it makes it unclear what is ultimately useful or what is not. Further, some information needed at the front-line level is not needed at the strategic level. There was a need to explore the use of specific data in-depth.

What we learned

The data stewardship form submissions revealed that Northwestern University Libraries is collecting data from 35 different systems and manually collecting at least nine data points. The manual collection is in some ways underreported as some of the systems from which data is pulled require that transactions (such as reference interactions) be manually added one at a time. A review of the systems revealed that there are occasions where multiple modes of data collection are used in order to gather and triangulate parts of what could as first be thought of as a single statistic.

Entrance and exit counts are one example of this. Users scan their university ID cards when entering the library. Affiliated users who arrive at the library without their ID fill out a paper form and, once verified as active, are allowed to pass through the gate without generating a record in the entry system. Meanwhile, visitors are issued a paper day pass which must be scanned by the barcode readers that scan IDs. Visitor entries do create a record in the entry system. The numbers of visitors is pulled from the visitor system. Further complicating matters, there are periods of time, such as orientation week, alumni weekend, and graduation, when the gates open. Anyone is free to visit the libraries during these periods. Therefore the entrance gate system data is useful for determining patterns of traffic (e.g., Are many students entering the library after 11 p.m. or have most already arrived? Is the library being used before noon on Sundays?). However, it does not generate a reliable number regarding the total number of users entering the space. Instead, the library uses the exit counts in order to have a grasp of the number of people using the library. The exit counts are generated by an infrared visitor counter. This system is also potentially unreliable as it has

difficultly tracking multiple people exiting together and it provides no additional data about users.

At the onset of the project, the authors hoped to find areas of duplication that could be eliminated. Instead, they found areas of overlapping data.

What we did/are doing

Reviewing the work, the authors developed a plan to centralize and provide more accessibility to data. A page was created on the library's intranet outlining the data sources, an explanation of what data is contained, a primary contact for that system, and the location where data or reports can be found. Alongside this guide, a central repository for data was created using the shared network drive. This allows for varied control of permissions for data that includes personally identifiable information as well as more permissive access to data that might be useful across the library.

The authors also hope to utilize Tableau Server to display visualizations of key pieces of data, displaying trends and aggregates. This will be particularly helpful when the underlying data is formatted, labeled, or coded in such a way that there is a learning curve to understanding the outputs. These visualizations will allow staff and administrators to answer key questions without the requisite work initially needed to understand the underlying data.

Providing an inventory and access to data is only the first step however. Developing a culture that sees data analysis as a foundational element requires champions willing to demonstrate skills and help to train fellow staff members. The authors are exploring the creation of a data analysis group as an addition to the Assessment Committee. This group will aid in the stewardship of data, provide assistance in analysis and visualization, and aid in the preparation of reports and surveys. This group may also be helpful in the efforts to create more data-focused work group annual reports. Reflecting on the first year of the reorganized library, work group leaders were asked to identify five to seven key performance indicators for their work group. These may be metrics that are already being tracked and are part of our data inventory or new metrics that better reflect the new work group's focus. This may require work in altering data reporting, developing new data sources, or adopting new modes of data analysis. The data analysis group can aid in this work while also understanding its context in the larger data environment.

There is hope that collocating data will provide the opportunity to develop new insights by comparing data points which were previously separate. For example, is this blending data or simply having the ability to consider variable A in the context of variable B by virtue of easily being able to view trends of both data points? This could be achieved by displaying related information in one Tableau dashboard. Or more simply, it could be that, since staff members can easily access both data points from the intranet landing page, the relationships more naturally emerge.

Even if we are able to succeed in collocating many data points, there are, as there always are, technological challenges to displaying data in a central place.

Conclusion

The goal of this project was to better understand the data landscape of Northwestern University Libraries as it existed during a time of transition. The hope was that this would better inform the use of data in decision making and allow for new insight from comparing data that was previously siloed. Collecting information about what data sources existed and how data was reported started to show the scope of issue. What the authors found was a data landscape that included often redundant or unnecessary data that made reporting difficult and data that was stored in a variety of places often with limited accessibility. A plan was formulated to gather data in a single, accessible place and index the data sources and reports that are available. In conjunction with the formation of a data analysis group, the hope is that the library will be able to move in the direction of more informed data-driven decision making and glean new insights from a more robust analysis plan.

Appendix A: Data Stewardship Form

1. Data: *What is the data?*
2. Data Description: *Description of data*
3. System(s): *Through what system(s) is the information generated?*
4. System Administrator(s): *Work group in charge of those systems*
5. Calendar Type: *Is data reported on the academic or fiscal calendar? Most user data should be reported on the academic calendar.*
6. File type(s) of reports: *What type(s) of file(s) are generated when this information is pulled/compiled?*
7. Work group(s) responsible for depositing data: *What work group is responsible for pulling this data?*
8. Personally Identifiable Information: *Does data contain personally identifiable information about users?*
9. Deposit Location: *Where is the data (once pulled/compiled) currently stored/saved?*
10. Written procedure for extracting and reporting data: *Optional*

The Power of Performance: Outcome Measurement in Modern Times

Denise M. Davis
Sacramento Public Library, USA

Emily Plagman
Public Library Association, USA

Abstract

In 2015, the Public Library Association, in partnership with the Performance Measurement Task Force, launched its latest field driven initiative: Project Outcome. Project Outcome is dedicated to helping public libraries understand and share the true impact of essential library services and programs. Project Outcome provides libraries with patron-focused surveys for seven primary service areas, online, interactive tools for collecting and analyzing the data, and practical guidance using the results for advocacy, planning, and decision making. The paper will study the participation rates and activity of its enrolled users, examining the participation and outcome measurement adoption rates across the field. It will also review the aggregated patron response data, collected by libraries across the country, in order to determine national trends of the outcomes of library programs and services. Lastly, it will identify areas where its users have analyzed the patron data and taken action as a result of their findings. The research design is simple and straightforward: aggregate library-participant data and patron responses were pulled and analyzed using Excel. The results represent data collected between January and April 2016. The results of this research will provide a clearer understanding of how the public library field is adopting outcome measurement and using the data to make better and more informed decisions about their library.

Background

Project Outcome identified seven essential library service areas that could be easily and directly linked to improving or changing patrons' knowledge, behavior, skills/application, and awareness: civic/community engagement, digital learning, economic development, education/lifelong learning, early childhood literacy, job skills, and summer reading. Immediate surveys are uniformly designed with a purpose of capturing agreement scale responses regarding the knowledge, behaviors, skills/application, and awareness of the program or service after participating in a program or service offered by the public library. Follow-up surveys were launched in June 2016 with a purpose of capturing adoption information from program or service participants. Guidelines for advanced assessment are in development and will be available in early 2017. The project's online toolkit offers a survey portal for scheduling surveys in each category and data dashboards to review aggregate responses using a range of data visualization tools. Survey responses can also be output to standardized summary reports for use with stakeholders and staff, and are available for export in spreadsheet format.

Methodology

Project Outcome's immediate surveys input by registered libraries between January 1 and April 12, 2016, were pulled for analysis. Immediate surveys use a Likert agreement scale, strongly agree to strongly disagree, and two open-ended questions for narrative feedback from service and/or program participants. Range response questions capture participant agreement with changes in four outcome areas—learning, confidence, use/learn, and awareness. For this preliminary study, only range response results were analyzed, and limited to the two highest response program areas—Education and Life Long Learning (ELL) and Early Childhood Literacy (ECL). Total survey response, program attendance reported, and survey response rate were used in analysis. Total responses by population of legal service area ranges as reported in the Public Library Association (PLA) Public Library Data System survey (PLDS) also are presented.

Broad program subcategories were established based on program title in order to cluster ELL responses. The subcategories were reviewed by Project Outcome staff and task force members, and have been applied only for the purposes of more meaningful analysis of aggregated responses. Categories for ELL include book groups, crafts, ESOL/languages, gardening, general programming, health/food, history/genealogy, skills, technology, and workforce development/job skills. Program titles for ECL programs were more difficult to cluster into subcategories and were, therefore, not established.

Responses

Survey inputs in the sample file represent public libraries in the United States and Canadian provinces. ELL surveys are from public libraries in CA, FL, HI, IN, KY, NY, PA, TX, UT, VA and the Canadian province Ontario; ECL surveys are from public libraries in CA, FL, and NY.

Figure 1 presents survey totals by PLDS population served ranges (see http://publiclibrariesonline.org/2014/05/2013-plds/). The ELL results include responses from 1,307 paper surveys and 80 web-based surveys for a total of 1,387 responses. No libraries with population served ranges below 10,000 are in the ELL test dataset. Notably, libraries utilizing web-based surveys were in population served ranges of 500,000 or more.

The ECL results include responses from 2,236 paper surveys and 16 web-based surveys for a total of 2,252 responses. No libraries with population served ranges of 10,000–24,999 and 50,000–99,999 are in the ECL test dataset.

Caveats

There were some quality observations noted in the sample data pulled for analysis. The first was attendance figures—in a few cases, survey responses recorded exceeded reported program attendance. This occurred twice in the ELL data sample and once in the ECL data sample. The second observation was blank cells—blanks ("not recorded") in attendance occurred only in the ELL dataset for one program. All records were retained in the sample file for the purposes of learning. The Project Outcome team is investigating alternative solutions to collecting and reporting attendance as part of future improvements to the portal.

Additional findings are available in Project Outcome's Annual Report, published in late October 2016, at www.projectoutcome.org.

Findings

Four key findings come from this preliminary analysis for the two most heavily used surveys. A few findings confirm expectations from the Project Outcome team and the Performance Measurement Task Force, while the third finding may be used to improve the data review process and over-arching learnings. The findings fall into two learning areas—data interpretation and data reliability.

- Data interpretation:
  - Ceiling effect for all outcome areas was anticipated and appears in the preliminary results
  - Analysis of results by outcome supports the expectation that national-level reporting on outcomes is possible
  - Developing a taxonomy to further sort programs may be valuable for some survey areas
- Data Reliability:
  - Survey response rates begin low and require ongoing commitment to build a body of results for greater understanding of impact (data reliability)

A concern acknowledged by the Performance Measurement Task Force throughout the survey design and piloting period was the ceiling effect, whereby results skew to a positive response range (data interpretation). This was borne out by the preliminary data analysis. Figures 2 and 8 present the overall results for the ELL and ECL responses. More than 89% of ELL and 90% of ECL respondents strongly agree or agree with the four program outcomes of the Project Outcome immediate surveys. The high level of positive response may be mitigated by careful review of the narrative responses and using them in combination to understand overall outcomes for a program or service.

A second area the task force had identified was recommending a less rigorous approach to selecting survey respondents over a more complex sampling approach (data reliability). Encouraging libraries to gather responses over time to understand impact was deemed less burdensome. Further, such an approach maintains the scalability of the tools for any size public library.

Figure 3 presents ELL total responses, attendance and response rate analysis by program subcategories. Survey response rates were lower in a few subcategories: general programming and workforce development/job skills—compared with gardening or technology. Gathering input over a longer period of time may yield more meaningful results. Figure 4 includes the number of ELL program respondents surveyed by category for the outcome "learning." Preliminary results support the premise that strategic surveying of iterative programs and increased participant responses increase a library's ability to gather meaningful data to understand ongoing impact of specific programs and services on the community. Additional investigation is required to determine if patterns of increased responses and higher or lower agreement emerge with the outcomes learning, confidence, use/learn, and awareness. Further, limited analysis of narrative responses is underway at this time. Linking narrative response analysis with agreement scales for each outcome is a next step in Project Outcome's assessment plan.

A third area of learning was the value in developing a taxonomy to sort ELL program titles into broad topical subcategories. This allowed for both aggregated analysis by outcome and more granular analysis by topical subcategory and outcome. Having both levels of analysis provides additional detail for national-level reporting on outcomes. Figures 3 through 6 present the ELL survey response overall and agreement results by outcome: learning, confidence, use/learn, and awareness. Drilling into ELL by program title subcategories also allows Project Outcome staff and task force members to improve methods and tools developed for the program overall.

This leads into the fourth area of learning, blending program areas. More defined program title subcategories by the four outcomes—learning, confidence, use/learn, and awareness—increases opportunities to speak more specifically to the impact of public library programs and services. It also supports engaging a wider audience through utilizing individual libraries' reporting on outcomes as part of state grant or other funder reports. Further, this result aligns with the PLA strategic plan core ideology—"strengthening public libraries and their contributions to the communities they serve," as well as specific goals around advocacy and awareness, and leadership and transformation.[1]

Finally, analysis of the aggregated results for each of the seven survey areas is also supported by data visualization tools built into the Project Outcome toolkit. Figures 9 and 10 present templates for presentation of aggregated results by outcome. Figure 9 presents the average score matrix for all categories and outcome area, and Figure 10 displays a chord display of aggregated results by outcome. State libraries have expressed interest in having similar displays for all public libraries in their respective states using Project Outcome surveys, and Project Outcome staff have created views specific to those requests.

Using Results for Change

Libraries across the United States and Canada have used Project Outcome results to make programming changes, identify partnership opportunities, apply for grant funding, and use their results for many different types of advocacy purposes. As an example, Plano Public Library System in Plano, Texas, used the Early Childhood Literacy (ECL) survey to measure the impact of STEAM kits they make available to patrons. In January and February of 2016, staff began inserting the surveys into the 30 kits that circulate at the Maribelle M. Davis Library. The kits were circulating approximately three times per month. The staff wanted to gather patron feedback on how the patrons were using the kits and to see if they might have suggestions for improving the STEAM kit program. The library had a 17% return rate for the surveys and as they expected, the patrons loved the hands-on experience of working with the items in the kits. They commented that this helped their children to learn and understand the topic better. They also liked that it was an opportunity to learn with their child. And they of course wanted more kits. The library staff were surprised, however, by some patron feedback suggesting the Plano Public Library System should do children's programs based on the topics of the STEAM kits. Some of the patrons were unaware of the numerous programs already being presented. During 2015, the Plano Public Library System had presented 436 Tween and Children's STEAM programs (excluding story time, teen, and adult programs). This feedback led to library staff to begin including a copy of the Plano Public Library System programming brochure, Engage, into each STEAM kit before it is checked out. Approximately 90% of the brochures do not come back with the kits. Based on the feedback from patrons and the popularity of the STEAM kits, the Maribelle M. Davis Library has doubled the number of STEAM kits available to 60.

Conclusion

The Project Outcome team anticipated many of the findings and the application of survey results to implement local improvements. They, along with task force members, will use these findings to improve the data collection and analysis process for participating libraries. Overall, the organic nature of the project supports iterative improvements. To that end, data analysis will be ongoing, and findings will be made available through the project website, www.projectoutcome.org.

Endnote

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FIGURES

Figure 1: Responses by Survey and Population Served Range

PLDS Population Served Range	Surveys in ELL Dataset	Surveys in ECL Dataset
1,000,000 or over	597	851
500,000 to 999,999	119	626
250,000 to 499,999	292	92
100,000 to 249,999	195	554
50,000 to 99,999	22	0
25,000 to 49,999	54	96
10,000 to 24,999	108	0
5,000 to 9,999	0	26
under 5,000	0	7

Figure 2: ELL Agreement Responses by Outcome

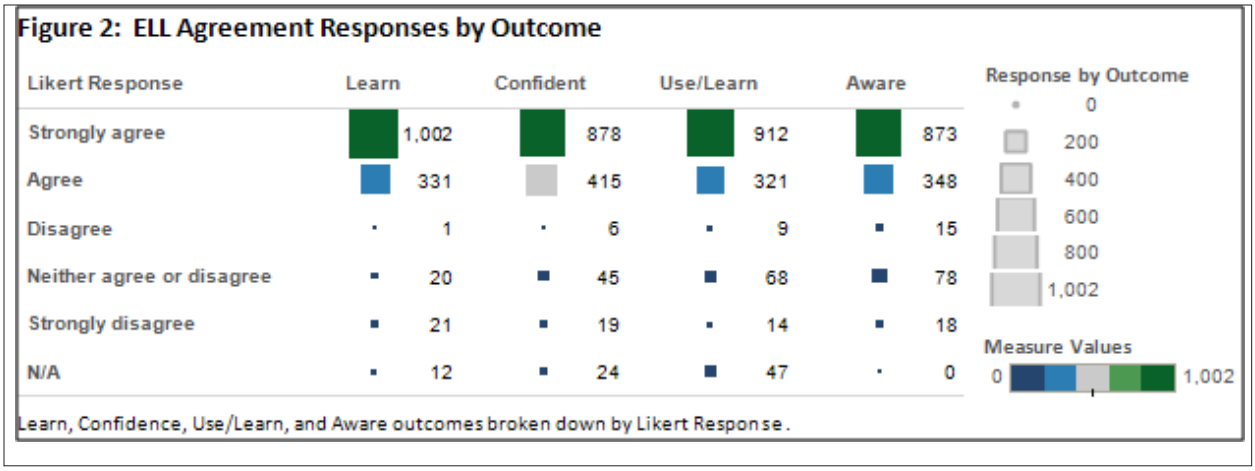


Figure 3: ELL Survey Responses, Attendance and Response Rate by Program Category

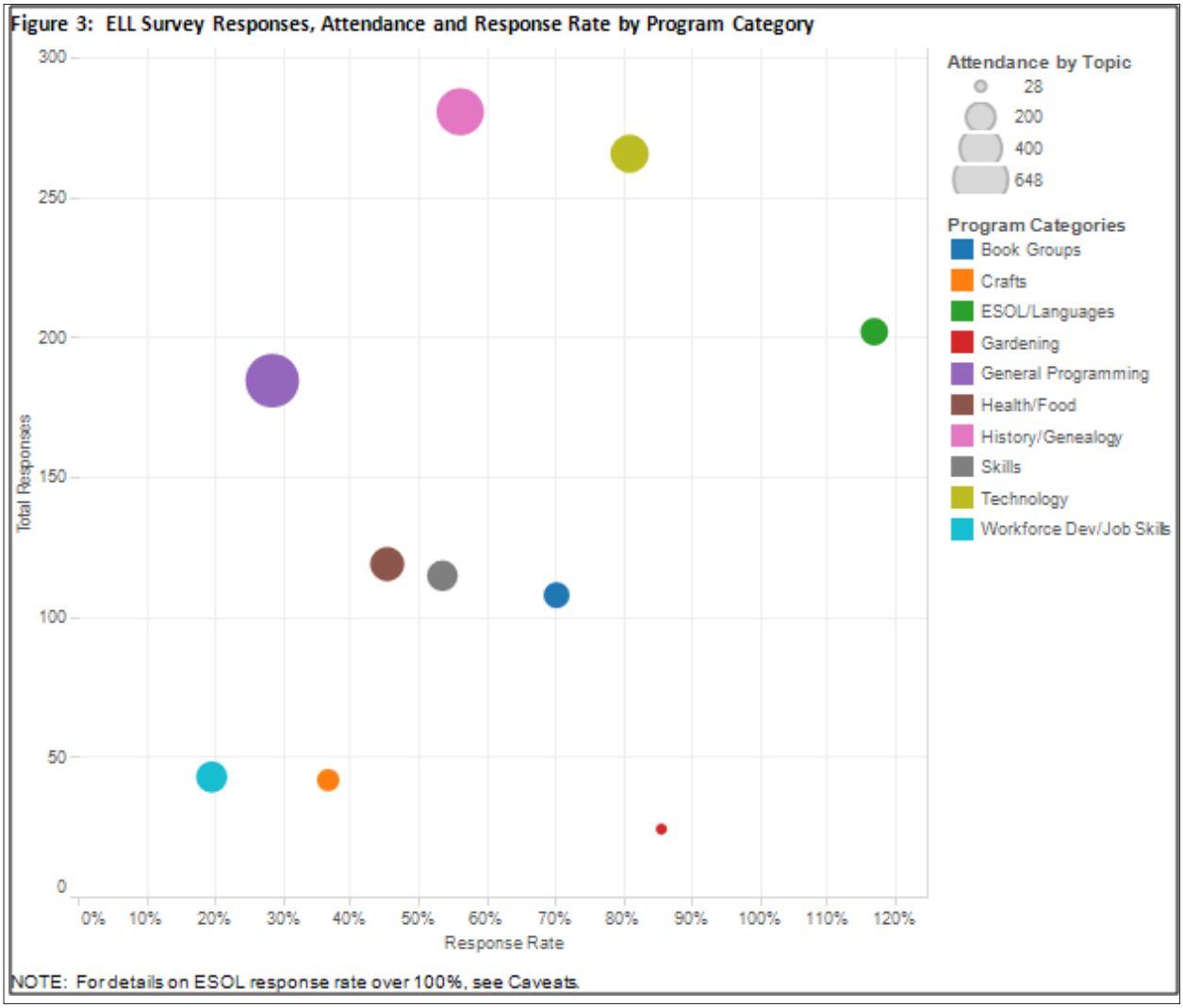


Figure 4: ELL Agreement Responses for Learning Outcomes

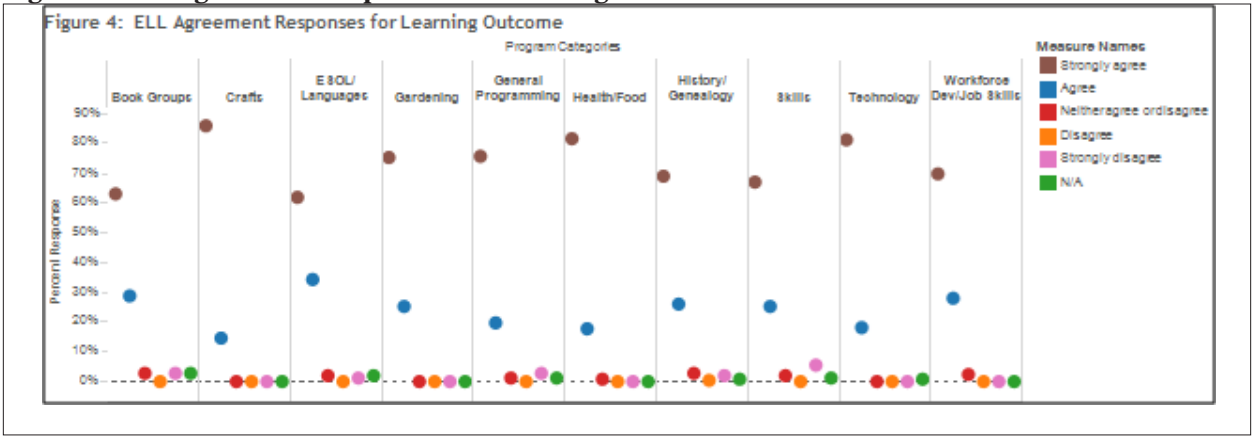


Figure 5: ELL Agreement Responses for Confidence Outcome

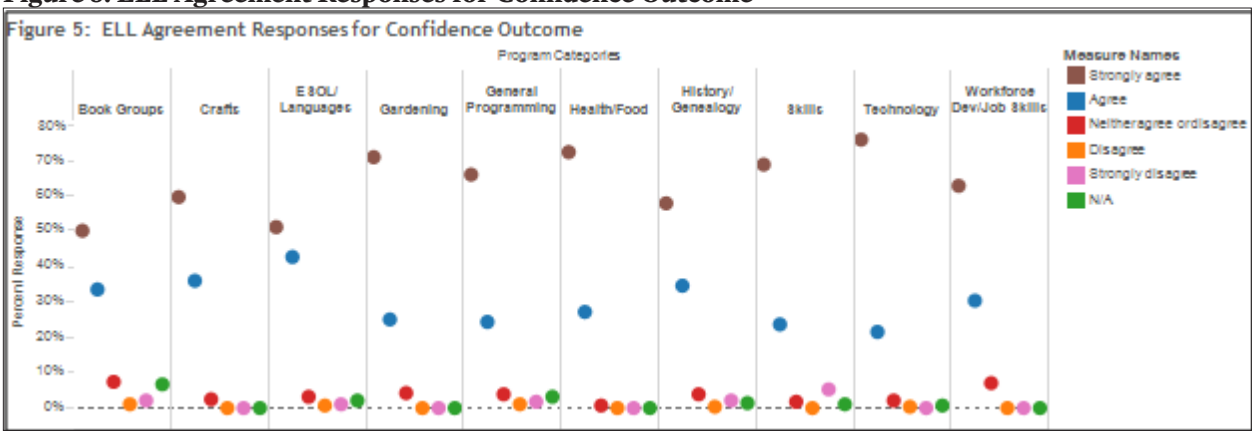


Figure 6: ELL Agreement Responses for Use/Learn Outcome

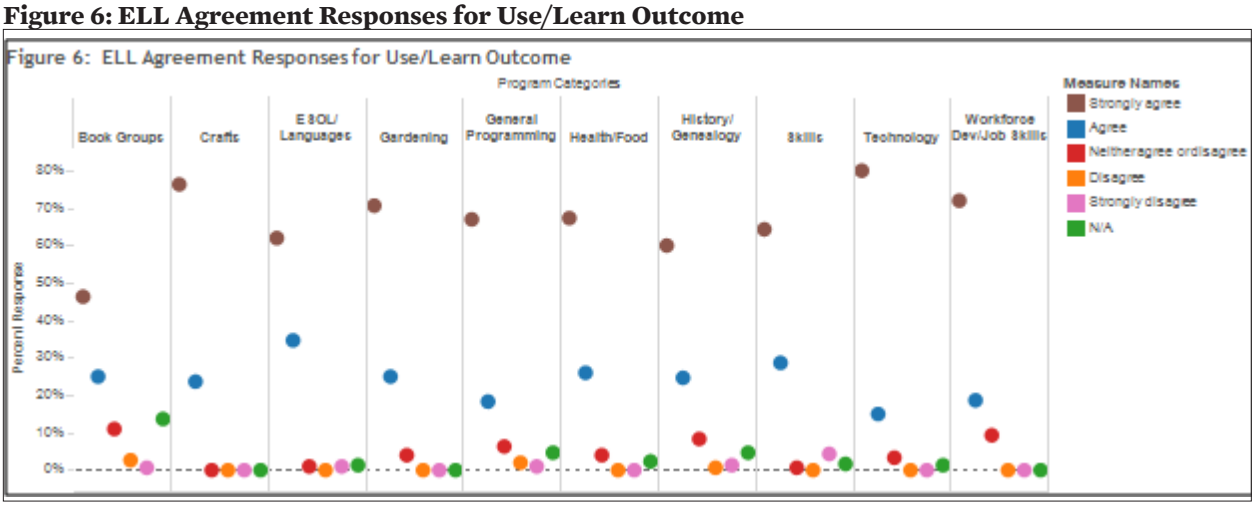


Figure 7: ELL Agreement Responses by Aware Outcome

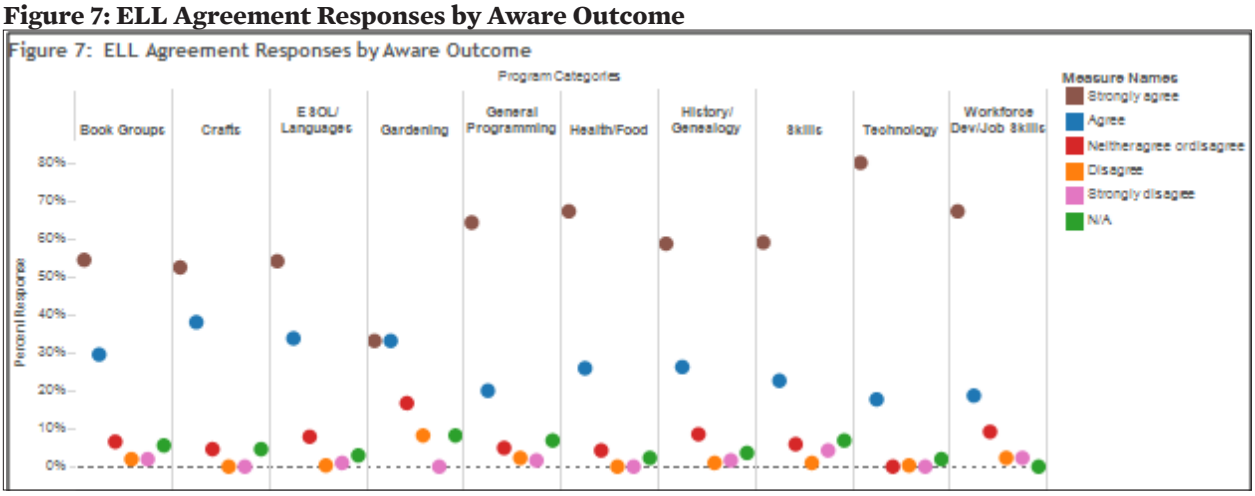


Figure 8: ECL Agreement Responses by Outcome

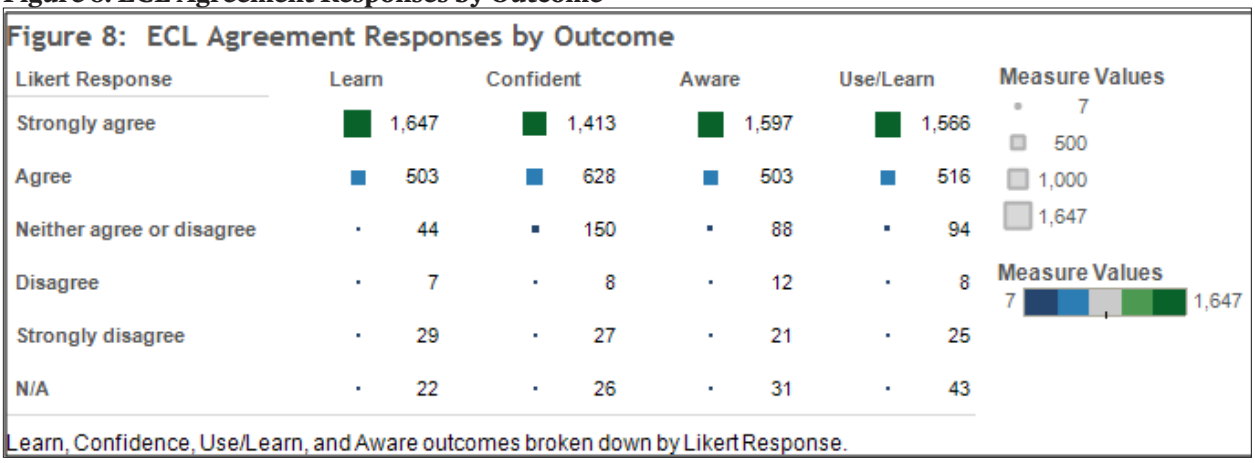


Figure 9: Average Score Matrix Project Outcome

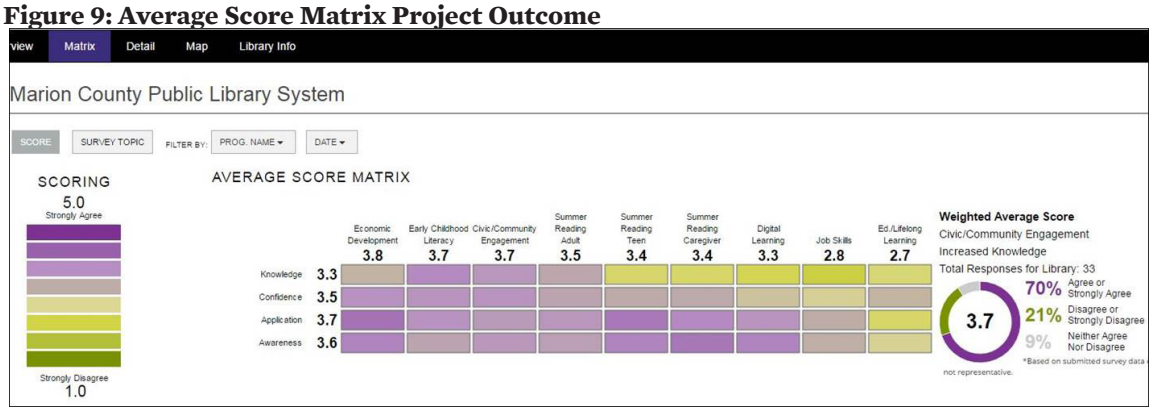
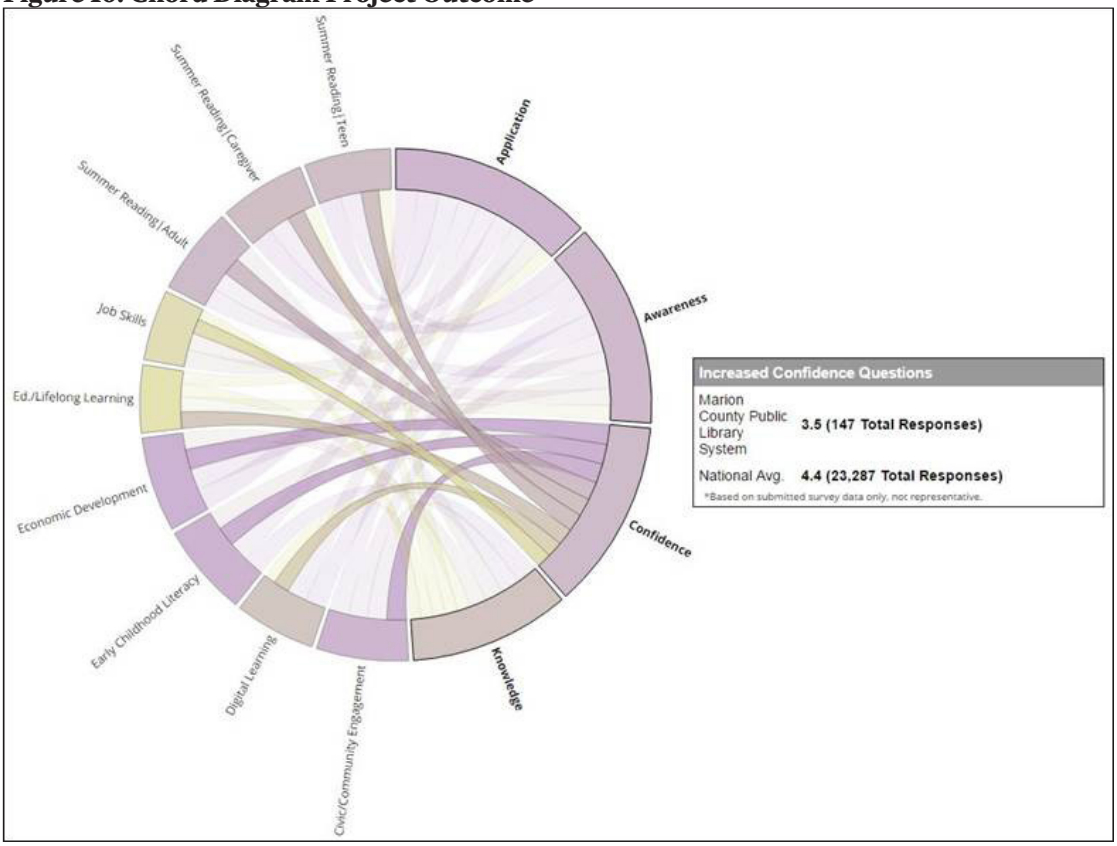


Figure 10: Chord Diagram Project Outcome



Showcasing Faculty Research with Elements and Tableau

Gabrielle Wiersma and Matt Ramey
University of Colorado Boulder, USA

Abstract

There are various metrics to calculate research productivity, but it can be difficult to collect the necessary data to measure the impact of scholarly works at an institutional level. Information about which books, articles, and other works have been published by faculty is recorded in disparate places such as departmental websites and individual curriculum vitae. Librarians at the University of Colorado Boulder (CU Boulder) have partnered with the Office of Faculty Affairs to systematically collect and analyze faculty publication data. This paper will describe some of the tools that CU Boulder is using, including Symplectic Elements and Tableau, and explain how these software systems can be used to analyze bibliometric data and showcase faculty research.

Introduction

Universities take great pride in the scholarly output of their faculty. Research outputs such as books, articles, presentations, and creative works are evidence of knowledgeable and engaged faculty who are capable of sharing their expertise with the world. Traditionally, research productivity has been measured by counting the number of scholarly outputs produced and how many citations are generated from those works. Research productivity is often used to calculate comparative and competitive rankings for academic programs and institutions. For faculty, scholarly outputs are requisites for achieving positive annual evaluations, tenure and promotion, and awards and recognition. For the university, scholarly outputs are essential for maintaining the overall academic reputation of the institution and recruiting and retaining the highest caliber students, faculty, and staff.

There are various ways to calculate research productivity, but it can be difficult to collect the necessary data to measure the impact of scholarly works at an institutional level. Information about which books, articles, and other works have been published by faculty is recorded in disparate places such as departmental websites and individual curriculum vitae (CVs). Data about how scholarly works are used, such as usage statistics or citations are also disconnected from the works themselves. Furthermore, these data sources may provide evidence of the work of a particular scholar or department, but they do not provide a complete picture of the faculty as a whole.

There are many groups on campus who are interested in collecting and analyzing publication data. Academic departments and administrators need to keep track of scholarly outputs for annual evaluations, tenure review and promotion, grant reporting, program review, and accreditation. In fact, the project at the University of Colorado Boulder started when one of the colleges asked if the libraries could provide a list of recently published books by current faculty, a task which was not easily accomplished.

The libraries have historically purchased books authored by researchers affiliated with the university, but these efforts were limited to purchasing books by known authors or relying on metadata and publication information in the book jacket or online ordering system to identify affiliated authors. Most of the burden of identifying relevant publications fell to subject librarians who were expected to identify and order resources based on their knowledge of the faculty in their assigned departments and by searching for publication information on academic websites or citation databases. Despite spending hours combing through websites and compiling information in spreadsheets or bibliographies, the data was incomplete and ineffectively formatted for reuse.

Understanding institutional research interests is vital to collection development in an academic library. The libraries at the University of Colorado Boulder are interested in scholarly activities to ensure that the collections and services we provide meet the research and teaching needs of our students and faculty. The libraries strive to provide access

to the resources that are produced and used by our faculty and want to share and showcase faculty research outputs with the rest of the world. Knowing that there had to be a more efficient way to collect, analyze, and share publication information with stakeholders, librarians began to contact colleagues on campus to find an alternative solution to manual data collection and static spreadsheets.

Since 2011, librarians at the University of Colorado have partnered with the Office of Faculty Affairs to systematically collect and analyze faculty publication data. "The Office of Faculty Affairs coordinates a variety of activities associated with faculty life and academic programming on the Boulder campus."[1] In addition to creating policies regarding recruitment, hiring, reappointment, tenure, and promotion, Faculty Affairs also maintains the Faculty Information System to track major events related to faculty careers. Faculty Affairs also manages a database of faculty activities related to research, teaching, and service called FRPA port. All tenure and tenure-track faculty on campus are required to submit an online Report of Professional Activities (FRPA) on an annual basis. The FRPA "is designed to serve as an annual inventory of a faculty member's professional activities" and is used by most departments to create reports and documentation for annual merit evaluations.[2] To complete the FRPA, faculty create entries to describe any new scholarly or creative works, teaching, and service activities completed in a calendar year. In addition, most faculty also submit an updated CV to FRPA port, making it a veritable gold mine of faculty publication data.

Access to FRPA port data is typically limited to a few people in each academic department who assist with annual evaluations. However, when librarians approached the office and explained that having access to publication information would help build collections that support faculty research, Faculty Affairs granted a small group of librarians privileged access to the data. The FRPA database was a historic Oracle Database built in the 1990s. Faculty manually entered information about their research, teaching, and service activities into separate text fields with numerical categories. Although the data could be exported by category (e.g., 407—Refereed Journal Articles or Chapters), it was a burden for faculty to enter this information and the free-text forms captured data that was difficult to reuse because the formatting was not standardized. Moreover, the data could not be batch exported from the system. In order to create a list of all publications, one had to open a report for each category and then copy and paste the data into another utility such as Word or Excel. Despite its being a central database for publication information, there was a lot of room for improvement.

When Faculty Affairs decided to upgrade to a new faculty information system, they consulted a group of librarians because they knew that we had been accessing publication data in the FRPA port database. The librarians provided feedback about necessary features for a new system including standardized data entry forms with more defined bibliographic elements and better export functionality. After careful consideration of multiple products, Faculty Affairs decided to pilot Symplectic Elements, a research information management system that many universities are using to collect, manage, and showcase academic research outputs.

Elements was selected because it provides a single site to capture and analyze faculty data and other contributions. Elements was designed to reduce the reporting burden on academics by aggregating publication data from authoritative sources to create structured reusable data for reporting and analysis. Publications can be manually added to Elements through web-based entry forms, which work similarly to the FRPA port system, but are more structured forms to improve data consistency. To initially populate Elements and to fill in retrospectively, Faculty Affairs hired graduate students to manually curate and add records for publications for all tenure track faculty. Going forward, APIs and data feeds will search, find, and ingest metadata for newly published scholarly works. Faculty Affairs has already activated multiple data feeds from major indexes like Web of Science, PubMed, and CrossRef to automatically populate the database. During the implementation phase, librarians suggested additional data sources and helped to configure the Web of Science API to supply citation information. Librarians also shared expertise about citation indexes, classification schema, and search strategies to extract the maximum number of citations from automated data feeds. The Elements system matches publication information to a list of current faculty and pushes citation information into the appropriate faculty member's profile. Faculty interact with the system to claim or reject authorship, link to co-authors, and they can easily export their own publication information in a variety of formats from Elements.

Elements was also selected because of its potential interoperability with other campuswide systems such as faculty profiles in VIVO. Select publication data and files like CVs can be uploaded into Elements and then pushed into public facing VIVO profiles. This would consistently populate faculty profiles and make it easier to keep their profiles up to date. VIVO profiles, which CU Boulder has branded CU Experts, are one example of how research institutions can showcase faculty research and connect researchers from across the institution and around the globe (https://experts.colorado.edu).

As a central data repository, Elements contains a wealth of information about faculty publications that can be used for a variety purposes. The Office of Faculty Affairs primarily collects this data for academic departments, who in turn use this data for annual evaluations. The libraries, however, are interested in publication data to ensure that they are collecting books and other faculty scholarship and to keep abreast of changing research needs and interests. Of particular interest are reports of the top cited publications based on citation counts from Web of Science and a list of journals by frequency (based on the number of articles per journal). Elements can produce a report that lists all of the publications for an individual, department, college, or the entire university.

Elements has built-in data analysis tools including reports, graphs, and statistics for a college, department, or single user. The comparative statistics are particularly useful for deans and departments who can quickly run a list of newly published books, articles, and other scholarly works by their faculty. Moreover, Elements provides structured reusable data that can be exported for a variety of purposes. The libraries can simply use a basic report for the entire organization and export publication information into an Excel spreadsheet or formatted bibliography. Reports in Excel can be sorted, filtered, and graphed. The reports, however, do not answer important questions about whether or not the library provides access to the books, journals, or other publications on the list.

The libraries have started to compare the list of faculty publications with library holdings to verify that books published by faculty are added to the collection and to determine if we are providing adequate access to the journals in which they most frequently publish. Initially, librarians manually searched for book and journal titles in the libraries' catalog and added holdings information to the spreadsheet. This was a very time-intensive process that ultimately produced a spreadsheet that was quickly outdated and designed to suit internal decision making, not to present to external stakeholders.

After connecting holdings, we also wanted to include additional information to evaluate the performance of the materials in our collection such as usage statistics, impact factors, and citation counts. All of this data could be incorporated into a master spreadsheet, but this project would require a significant amount of time. Data from multiple spreadsheets can be combined in Excel, either manually or with the use of formulas, though this is not necessarily the most efficient way to collect and analyze data from multiple sources. There are many types of statistical analysis software that can connect or combine different data sets such as SAS (Statistical Analysis System), Stata, or SPSS (Statistical Package for the Social Science). Multiple spreadsheets or data sets can also be combined in a relational database such as Microsoft Access. Librarians considered all of these options but lacked the technical skills and necessary access licenses to most of these resources. We had been researching different types of data visualization software and decided to try to analyze this data using Tableau.

Collection Analysis using Tableau

Tableau is business intelligence software that many libraries are using to create data visualizations and dashboards. Tableau offers a variety of end user licenses including a freely available version called Tableau Public. Anyone can use the Tableau Public software and create data visualizations by registering for an account and downloading the application (https://public.tableau.com/s/). Tableau Public contains most of the features and functionality of the more robust paid versions except that visualizations cannot be saved locally (they must be saved to the Tableau Public server), and there are certain limits regarding the types of data that can be ingested and the size of the files that can be processed.

Unlike some statistical analysis programs, Tableau is relatively easy to learn and requires little to no technical skills to use. The interface features drag and drop capabilities for manipulating data and users can change the type of visualization with the click of a button. New users can find help on the

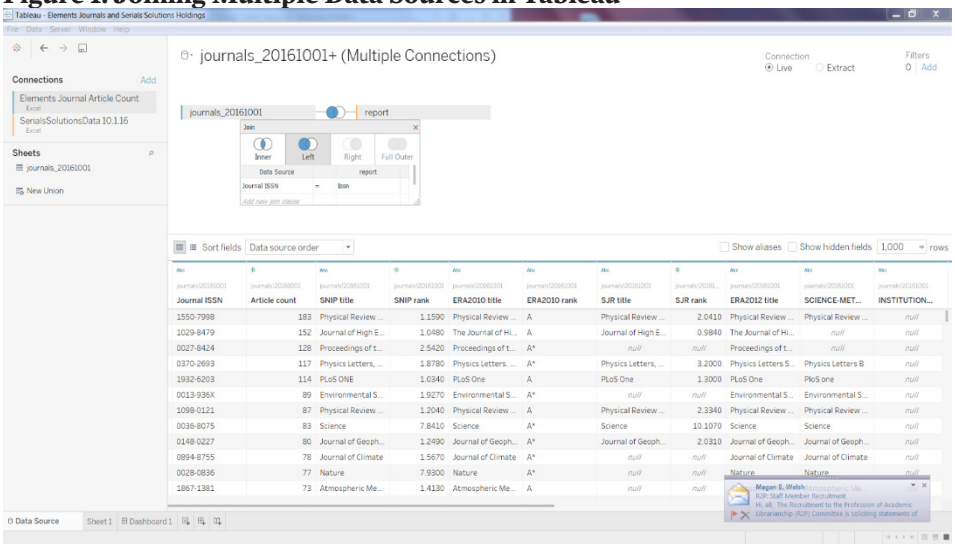
website including video tutorials and forums where questions are discussed and answered by an active user community. There are many other books and guides that describe the features and functionality of Tableau as well as best practices for creating data visualizations.

In addition to creating dynamic data visualizations, Tableau is a useful data analysis tool because it can connect and combine data from many different sources. It can connect to Excel spreadsheets, but it can also connect to Access databases, statistical files (e.g., SAS, SPSS), and many different types of servers (e.g., SQL, Oracle). This is particularly useful for collection analysis because collection data is often available from multiple sources such as an integrated library system, e-resource management system, usage statistics, or an authoritative list. Tableau can combine data from multiple sources as long as there is a unique match point in each of the sources. For example, an International Standard Serial Number (ISSN) is an excellent unique identifier for connecting journal data in multiple sources. It can be easily exported from an ILS and is often included in standard usage reports.

The libraries are using Tableau to analyze the journals in which faculty publish by connecting a variety of data sources and matching them on the ISSN. The Element report identifies which sources have the most journals and highest citation counts and this information can be combined with print holdings data from the ILS and online holdings data from Serials Solutions, usage statistics from COUNTER reports, citations and journal rankings from Web of Science and Scimago. Depending on how Elements is configured, it may already include some of the citation and journal ranking information from Web of Science and Scimago. Other data sources may be connected as needed using ISSN or another unique identifier as a match point.

Setting up data connections in Tableau is similar to creating relationships between different tables in Access or writing a join function in an SQL query (see Figure 1). Tableau can create inner, left, right, and full outer joins to accommodate the availability of data in each table or data source.

Figure 1: Joining Multiple Data Sources in Tableau



After the sources are connected, data fields can be pulled from any of the sheets and analyzed. If the data is not available in one of the sources, then Tableau will display a null value. A basic table combining the journal reports from Elements with holdings data can indicate where the libraries have access or gaps in coverage. Analysis revealed that the libraries provide access to most of the journals in which faculty have published articles including 99% of journals with 10 or more published articles and 100% of the journals with the highest cited articles. These findings demonstrate that the libraries' collections support faculty research and that the libraries are making a substantial amount of scholarly resources available to the university community.

Librarians used Tableau to create different types of graphs to visualize the top 200 journals based on number of articles and citation counts. Bar charts that can be filtered by year are useful for visualizing the journals with the most articles, and a tree map is an interesting way to visualize citation counts by journal or academic department (see Figures 2–3).

Figure 2: Excerpt of the Bar Graph of the Top 200 Journals by Publication Year in a Tableau Story

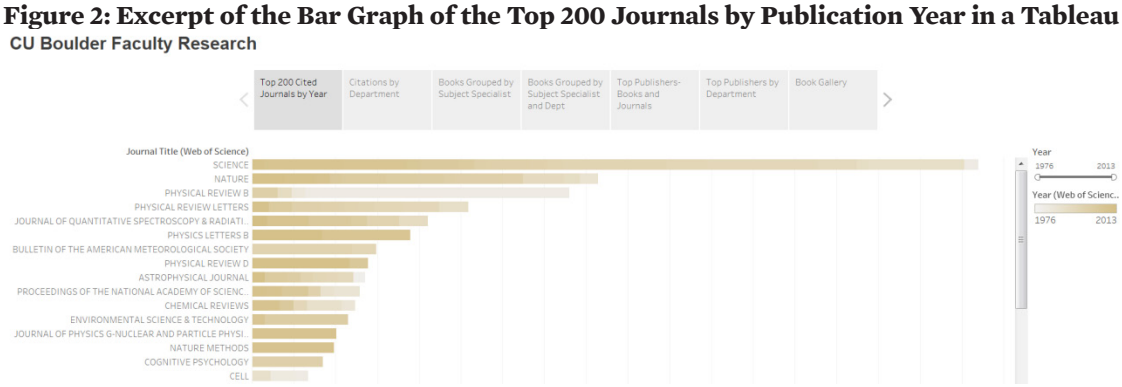
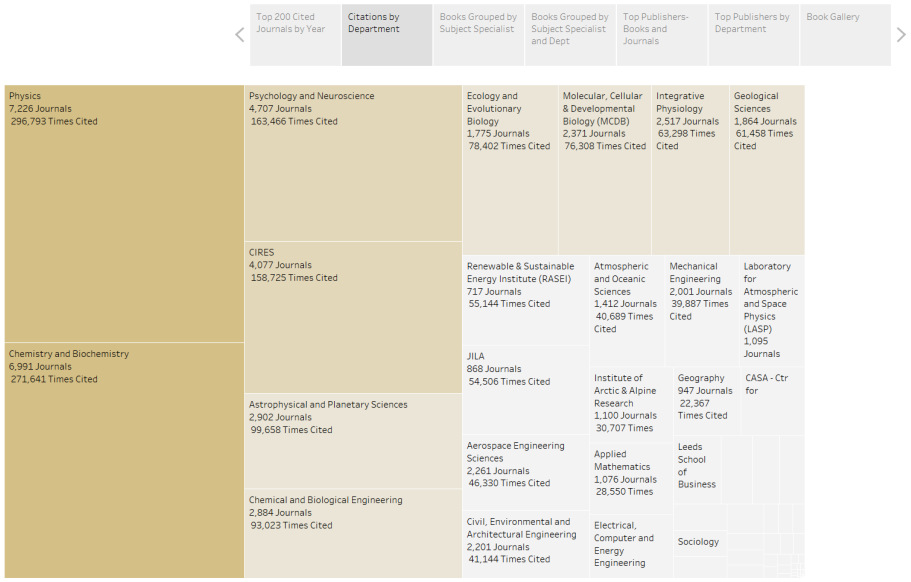


Figure 3: Tree Map of Citation Counts by Academic Department



Visualizations in Tableau are interactive and easy to customize. Visualizing the data makes it easier to see patterns or trends, especially if the data can be charted over time. The visualizations for journals illustrated research productivity for each department and highlighted the most important journals within each field. The libraries are using this information to ensure that we provide access to these resources, but these visualizations could also be published on a publicly available website to showcase faculty research productivity more generally.

Librarians also used Tableau to analyze the list of books from Elements. After combining and comparing the Elements report to ILS data, we found that the libraries have most (75%) of the books published by our faculty. It was still necessary to manually search for the books in the libraries' catalog, but this process was streamlined by inserting a URL for each title that performed a catalog search by title. The book data was added to a dashboard that included analyses by publisher and subject and grouped the data by academic department or subject librarian. These dashboards allow subject librarians to view books by faculty in their assigned

departments and also reported the most important publishers within each discipline. This information can be used to modify the publishers on the libraries' approval plan and will help guide selection of new materials.

Publication data from Elements will also be used for other collection management projects. The books on the list will be used to insert a note in the libraries' catalog record to indicate that a book has a CU Boulder author or editor. This note will display in the public records and will also be keyword searchable so that any user could find a list of books by CU Boulder authors in the libraries' catalog. The libraries may also use these data to create physical and online displays of recent faculty publications. Annotating books by CU authors will also be useful for identifying materials to keep onsite. The libraries typically send books with low circulation to a high density storage facility, but staff can use the notes about CU Boulder authors to selectively keep the books written by faculty and research affiliates onsite.

Connecting the lists of faculty articles to journal holdings and usage statistics could also inform decisions about journal renewals, cancellations, or back file purchases. Filtering the journals by year indicates which journals are most relevant to current scholars and some which may have been important in the past but are no longer applicable. Tableau could also be used to compare and analyze usage for any number of e-journals in the libraries' collection. Usage data could be manipulated to identify high and underperforming journals by title, subject, or publisher.

Next Steps

The authors still have many other types of publications (e.g., conference proceedings, book chapters, and creative works) to review, but these types of materials will require more manual analysis. In addition to scholarship and creative works, Elements also tracks service and teaching activities. These data will not be fully integrated into the system until 2017, but there is a potential for further analysis and an opportunity to learn about the use of scholarly resources in academic courses. The libraries are interested in learning more about which resources are used as textbooks and other assigned readings, and it may be possible to glean some of this information from course descriptions and syllabi if that information is uploaded into Elements.

The authors are also interested in further bibliometric analyses of faculty's scholarly outputs. In addition to analyzing the publications themselves, we are interested in determining whether or not the libraries provided access to the resources that are cited in books and articles. Having structured metadata not only makes analysis of our articles possible, but it could also offer the ability for librarians to do in-depth analyses of cited references to further trace the research lifecycle. For some publications, the cited references may be data mined from the Web of Science API. This would provide further evidence about how well library resources support successful research projects.

The data included in Elements reports are intended for internal use by departments and administrators. As such, many of the initial dashboards were created to inform internal decision making, such as filling in library holdings and identifying research trends. But there have been discussions about creating dashboards that would publicly showcase faculty research in an online gallery with supplementary data. Ideally, book covers or other representative images could be displayed in a digital gallery that could be sorted by department, subject, or year. In addition to Tableau, there may be other tools that might be better suited to showcasing research, such as a Digital Commons Book Gallery or a journal or article gallery in BrowZine.

The libraries also manage an institutional repository (IR) on the Digital Commons platform (CU Scholar). This platform is designed to publish and present various types of scholarship and CU Scholar is "intended to serve as a platform for preserving the research activities of members of the CU-Boulder community, and for promoting that research to the general public."[3] Many other institutions are using Elements to populate an institutional repository by collecting and passing publication data from Elements into the IR. CU Boulder has not implemented a workflow to ingest Elements data into CU Scholar, but this could potentially increase the number of submissions to the IR and would provide additional support for faculty to comply with the university's open access policy.

We are also exploring different ways to keep the data updated. Most of the Tableau dashboards are connected to static Excel spreadsheets and do not reflect changes to the Elements database or other updates. The Elements system is regularly searching,

identifying, and ingesting new publication data from scheduled searches and API calls. In addition, it is updated annually as faculty submit their annual reports of professional activities. It may be possible to connect Tableau to Elements through an API or SQL query, which would provide a real-time data connection and automatically refresh the data.

Lessons Learned

Partnering with the Office of Faculty Affairs was beneficial for many reasons. It allowed the libraries to tap into an existing data source for faculty publications so that the libraries did not have to duplicate efforts to collect this information. They also provided substantial technical and administrative support for the project. Faculty Affairs provided funding, project management, and hired staff with the technical skills to facilitate implementation including programming skills to customize the interface. It is important to note that the mandate for faculty to submit information to Elements comes from the Office of Faculty Affairs with the backing of the provost and executive vice chancellor for Academic Affairs, not the libraries. Faculty must submit a complete FRPA in order to be eligible for merit increases, so they are highly incentivized to submit this data as part of their annual evaluation. The implementation of Elements may not have been as effective if the library alone was asking faculty to voluntarily submit data.

The libraries and Faculty Affairs are using a variety of products to collect, analyze, and showcase research. Each tool has unique strengths and functionality, and it is possible that there is no single solution to accomplish all of these tasks. Further research and discussions need to occur to determine how best to leverage the available tools and creative a cohesive presentation of this information to stakeholders.

Conclusion

Citation data is readily available in many places but libraries need tools to collect and analyze it.

Research information management systems like Elements aggregate citation data from multiple sources and format the data in such a way that it is easier to analyze and export for further analysis. Using Elements to record and report scholarly research activities has improved the user experience for faculty who must enter this data on a regular basis and has streamlined analysis of faculty research outputs. It has also made publication and other data more accessible to individual faculty, departments, and other stakeholders on campus.

Complementary tools like Tableau can support further analysis and present the data to stakeholders in dynamic and informative dashboards. Dashboards can be designed to inform decisions or simply celebrate research accomplishments. Creating these types of custom dashboards to showcase faculty research and measure research productivity is useful for individual faculty, administrators, and librarians alike.

The university libraries have gained a considerable amount of information about faculty research activities due to this access and the improved functionality that the Elements system provides. The libraries now have a reliable listing of faculty publications that is updated on a regular basis. Librarians can log into the Elements system and download publication reports for any department or college as needed. These reports can be combined with other data and customized to present to different audiences using dashboards and stories in Tableau. Interactive Tableau dashboards can illustrate the connections between faculty research and library resources and demonstrate the value of library collections by indicating how well the library supports faculty research.

The libraries are successfully using the Elements data to systematically collect books by CU Boulder authors and subscribe to journals in which our faculty are publishing. As the Elements data continues to expand, the libraries plan to continue to access and analyze publication and other data. This will undoubtedly strengthen and guide collection development as the libraries learn more about faculty research interests and needs.

The collaborative effort between the libraries and Faculty Affairs has made significant progress towards a university-wide shift from citation data collection to research information management across the research lifecycle. Hopefully, streamlining the process for collecting and analyzing faculty research outputs in systems like Elements and Tableau will create more time for us to delve deeper into the bibliometric data and complete more in-depth analyses to determine how these outputs impact research and learning outcomes.

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Assessing International Students in the Library Instruction Classroom

Susan Avery and Kirsten Feist
University of Illinois at Urbana-Champaign, USA

Abstract

The face of the instruction classroom in college and university libraries is rapidly changing as the presence of international students at academic institutions in the United States continues to grow. The 2015 *Open Doors Report* notes a growth rate of 10 percent in 2014–15, the highest since 1978–79. For many of these students this marks their first foray into academic research and academic libraries, in a setting and culture that differs markedly from that of their home countries, all in a non-native language. This paper is focused on an assessment of first-year international students in English as a Second Language (ESL) courses at the University of Illinois at Urbana-Champaign. We sought to discover what strategies would have the greatest impact on international students' success as they engaged in the research process.

Background

The University of Illinois at Urbana-Champaign has one of the largest international student populations in the United States. In fall 2015 there were 10,208 international students at Illinois, of whom 5,410 were undergraduates.[1] This reflects a 21 percent increase from only five years prior. Similar increases can be noted nationally as well (see the *Open Doors Report*[2] for complete details). Because international students come from varied backgrounds and library experiences, the impact of library instruction on their academic endeavors can be particularly meaningful. At the University of Illinois, the undergraduate library is responsible for the provision of library instruction to the introductory first-year writing courses that fulfill the university's Composition 1 requirement. These include courses in the departments of Rhetoric, Communication, and English as a Second Language (ESL). Upon their arrival at Illinois, international students complete an English Placement Test (EPT) after which they are placed into a Composition 1 course. Most will complete courses in the ESL department. Individual scores on the EPT result in students either completing a one semester course, ESL 115, or a two semester sequence, ESL 111 and 112. The course description for ESL 115 indicates, in part: "Students learn how to choose a focused topic, develop a thesis statement, and to find and evaluate library materials to use as support in their writing."[3]

In order to facilitate this outcome, library instruction has been integrated into each section of ESL 112 and ESL 115 since 2008. The study in this paper was conducted during the 2015–16 academic year and assessed the effectiveness of two assignments in first-year ESL writing courses for international students. The research took place in the context of an ACRL Assessment in Action (AiA) project. AiA projects were designed to assess the library's impact on student learning. In spring 2015, the authors' proposal was accepted into the third year of the AiA program. Summer 2015 was spent planning the assessments, and the assessments themselves began with the start of fall semester 2015.

Library instruction is embedded into all sections of ESL 112 and 115 and collaboration between the undergraduate library instruction librarians and the ESL curriculum coordinator assures the instruction takes place at point when it is most beneficial for the students. The timeliness of the instruction is crucial in order to establish the highest degree of relevancy. All sections of ESL 112 and 115 use a common syllabus and assignments. The assignments in ESL 112 and 115 ultimately result in students locating and integrating scholarly research into their papers. In each section students are required to complete a "Research Process Portfolio" and the two assignments assessed in this study are elements of this unit. Students in each section utilize the same prompt for their research paper: *Choose an organization that is actively working towards addressing a problem in society (community, state, region, or country) affecting a distinct population (women, animals, children, etc.). Write a problem/solution paper that describes and critiques three current solutions offered by the organization and recommends how to improve them.*

The academic research process is an unfamiliar concept for most first-year students and there are many new and unfamiliar challenges students face, including challenges for those who are native speakers of English. This process is significantly more difficult for international students who must face these challenges in a language that is not their native tongue. Prior to beginning this study the authors theorized (based on their prior experiences and anecdotal evidence) that students were likely to struggle with three elements: creating focused topics, identifying keywords and alternatives, and differentiating resource and article types. The study specifically assessed these elements of student research. The initial assessments took place in fall semester 2015 and they were repeated in spring 2016 following some adaptations, based on the results of the assessment of the fall 2015 data.

Methodology

Two assignments completed by students in ESL 112 and 115 were evaluated in this study. The first assignment consisted of a concept map worksheet (see Appendix A) completed by students prior to library instruction. The intent of the concept map was to assist students in creating a search strategy by concisely defining their topics and identifying keywords and potential alternatives to those keywords. The second assignment assessed specific aspects of annotated bibliographies created by the students. Following the protocols established by the Institutional Review Board, the authors recruited students from four sections of ESL 112 and four sections of ESL 115 in fall semester 2015. Sixty-nine students agreed to participate in the study. The study was repeated in spring semester 2016 with 38 students participating from two sections of ESL 112 and two sections of ESL 115.

Approximately one week prior to the library instruction all of the students were instructed to complete a concept map worksheet for their topic. As noted above, the concept map guides students in the creation of a search strategy. In addition, it is also a tool that helps prepare them to search in a library database and understand why a search strategy that might be effective in Google might not be successful in a library database. Instructions for completing the concept maps were included in the course's library guide (LibGuide) page (see http://guides.library.illinois.edu/eslundergrad). The instructions included a short video explaining the process for completing a concept map, step-by-step written instructions, and an example of a completed concept map. Following the completion of the concept map, each student deposited their assignment into a forum in their section's course management website. Each of the eight sections participating in the study maintained a presence on Compass, the online learning management system widely used at the University of Illinois. The authors were each responsible for providing feedback to students in four sections. The concept maps required students to (1) write their topic statement and identify keywords from this statement, and (2) list alternatives for each of the keywords. Librarians reviewed and provided feedback to students directly on the completed concept maps. The concept maps would then serve as the foundation for the database searching to take place during the library instruction. The intention of the feedback was to help students create a concept map that was "database ready." The librarians provided suggestions for refining topic statements and keywords and shared suggestions for keyword alternatives that were likely to yield results in a database. The feedback was provided to all students, whether or not they consented to participate in the study. However, only those consenting to participate in the study are included in the study results. For those students participating in the study, the authors applied a rubric to each of the concept maps. Rubrics were developed for assessing the topic statement and the keywords and alternatives (see Appendix B). The authors completed some initial assessment together in order to assure inter-rater reliability.

The second assignment that was assessed for this study was the annotated bibliography. Assessments were completed for five students from each section; individual students were randomly selected from each section. Each student was required to include five sources in their annotated bibliography and each ESL instructor required students to address specific elements for each source. These included a brief summary of the article, an explanation of its relevancy to the student's research topic, and a statement addressing the reliability of the source. In their assessments of the annotated bibliography assignment, the authors included the reliability statements, focusing on the criteria students used to determine each article's reliability. A rubric was applied to the reliability statement of each individual source (see Appendix C). In addition, we sought to discover additional information about each of the sources students included in their bibliographies. These included factors such as whether or not the articles were found in a library database and, if

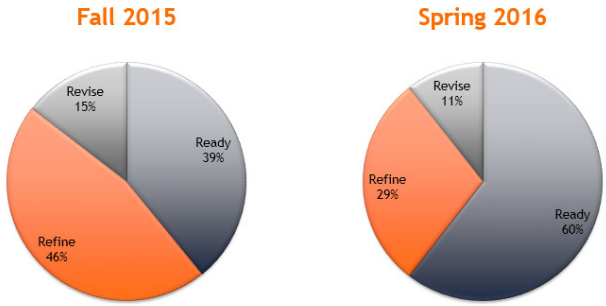
so, the likely database; the date and length of each article; article type (scholarly, magazine, news, or web); and relevance to the student's topic on their concept map. Ultimately we were evaluating the learning that took place as a result of the library instruction.

Findings

The authors reviewed concept maps for all 69 students from the eight sections of ESL 112 and 115 who consented to participate in the study during fall 2015. Of these 69 students, 61 percent needed to revise or refine their topics, while 39 percent developed topics that were considered by the authors to be "research ready" (Figure 1). Examples of student topics from each of the defined categories include:

Ready—How salary is related with job satisfaction in developed countries
Refine—Feeding the hungry in America
Revise—Teenage depression

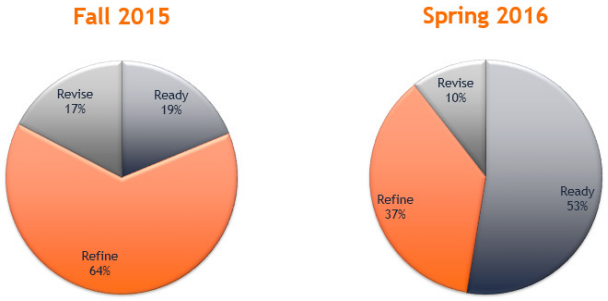
Figure 1: Topics



While developing strong topics certainly presented challenges in fall 2015, what proved to be more difficult for students in completing their concept maps were (a) identifying the main concepts represented in their topics and (b) brainstorming strong keywords and suitable alternatives. In total, 81 percent of students needed to refine or revise their keywords and alternative terminology, while only 19 percent brainstormed keywords that were considered by the authors to be "database ready" (Figure 2). These findings bolstered the authors' previous assumptions that brainstorming strong terminology would potentially be difficult for students. Examples of student keywords from each of the defined categories include:

Ready—Indonesia (main keyword), Sumatera, Java, Southeast Asia
Refine—Avoiding (main keyword), Keep off, Invalidate, Annul
Revise—Health (main keyword), Disease, Poor region, Cheat

Figure 2: Keywords and alternative terminology



Additionally, of the eight participating sections, the authors received annotated bibliographies for 30 students and assessed 145 individual sources. While students were allowed to use a variety of credible source types for their assignment, they were encouraged to familiarize themselves with scholarly research in particular. Based on these parameters,

the authors found that the majority of students pursued scholarly articles to support their research.

Of the 145 sources reviewed in fall 2015, 75 percent were classified as scholarly or academic, 45 percent were written within the last two years, and 59 percent were over 9 pages long. Furthermore, 79 percent of these sources were retrieved from databases, with 78 percent specifically found in Academic Search Complete, which was the primary teaching tool used in ESL library instruction sessions (Figures 3–7). Some obstacles students faced in favoring scholarly materials over other credible source types included the propensity to select articles above the comprehension level of the average first-year student or selecting lengthy law reviews that were inappropriate for the scope of the assignment.

Figure 3: Article Type

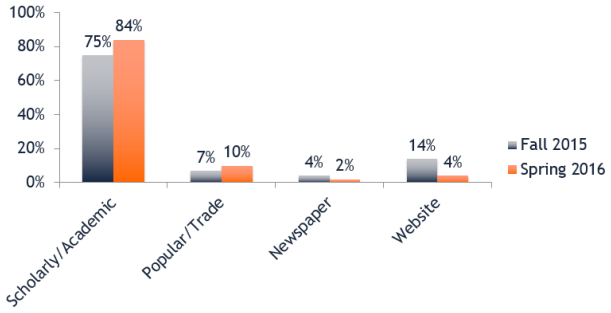


Figure 4: Article Date

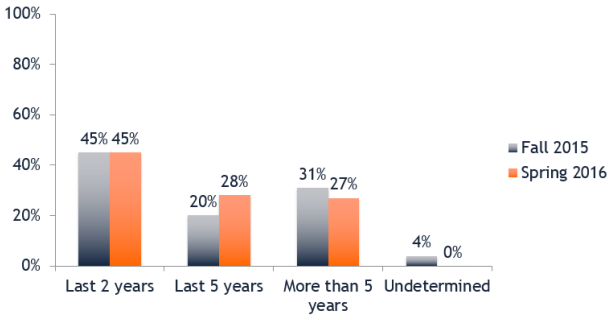


Figure 5: Article Length

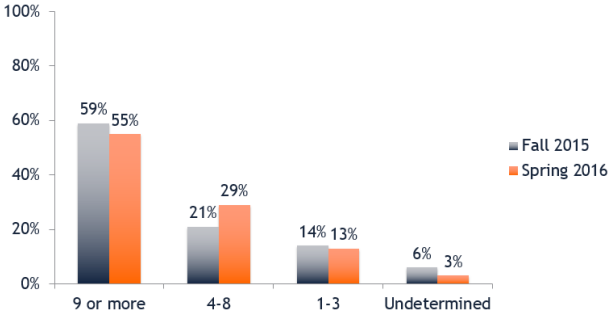


Figure 6: Retrieved From

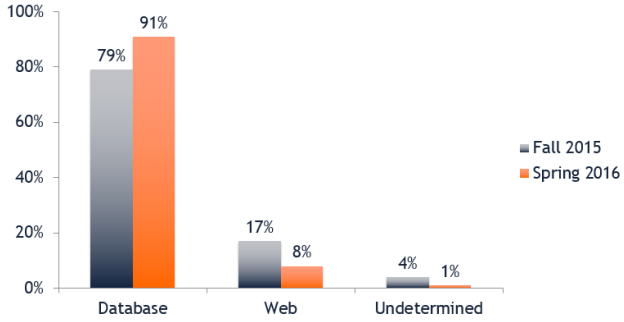
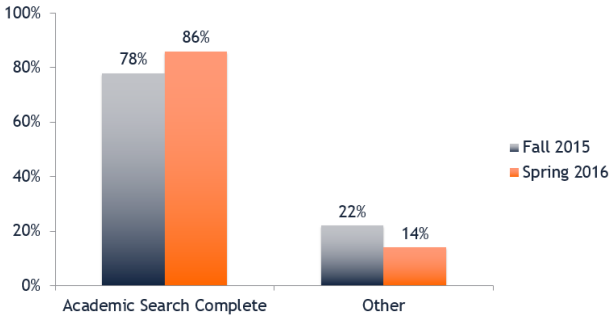
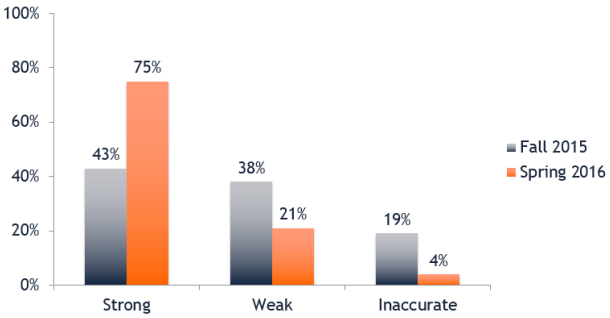


Figure 7: Database



Finally, while students were largely successful in locating credible sources, they did have difficulty articulating why each source was credible in their reliability statements, with 57 percent of sources having either weak or inaccurate statements supporting their inclusion in the annotated bibliographies (Figure 8). An excerpt of a rationale commonly encountered by the authors in fall 2015 is, "The article is found in the database of UIUC library [sic]..." Regarding minor discrepancies in the final totals represented in the charts, the authors did not receive annotated bibliographies from one of the eight sections, two students did not submit all five sources, and not every category applied to each source.

Figure 8: Reliability Statement



Based on the concept map data from fall 2015, the authors made modifications to the "flipped" instructional module in the ESL 112 and 115 LibGuide that supports students in completing their concept maps prior to library instruction. Namely, the authors identified the need for a new video containing clear, step-by-step instructions for completing concept maps, as well as the need for modified instructions on the worksheet itself (Appendix A). In addition, examples of concept maps in multiple instructional formats were added to the LibGuide. Based on the data from the annotated bibliographies, a new infographic was created for the ESL 112 and 115 LibGuide that highlights the

elements of a strong reliability statement, and the standardized library instruction outline for ESL 112 and 115 was likewise modified to discuss the importance of carefully evaluating each source for credibility and the ability to comprehend the content prior to synthesis.

Following these instructional modifications, the authors observed a marked improvement in the quality of work submitted by the ESL 112 and 115 students in spring 2016. The authors reviewed concept maps for the 38 students from four sections of ESL 112 and 115 who consented to participate in the study (roughly half the total of fall 2015). Of these students, 40 percent needed to revise or refine their topics compared to the 61 percent in fall 2015, while 60 percent developed topics that were considered by the authors to be "research ready" compared to the 39 percent in fall 2015 (Figure 1). An improvement was also observed in the identification of main concepts and the brainstorming of keywords and alternative terminology, though students still had some difficulty with this. In total, 47 percent of students needed to refine or revise their keywords and alternative terminology, compared to the 81 percent in fall 2015, while 53 percent brainstormed "database ready" keywords, compared to the 19 percent in fall 2015 (Figure 2).

Additionally, the authors reviewed annotated bibliographies for 20 students and assessed 100 individual sources. Of these 100 sources, 84 percent were classified as scholarly or academic, 45 percent were written within the last two years, and 55 percent were over 9 pages long. Furthermore, 91 percent of these sources were retrieved from databases, with 86 percent found in Academic Search Complete (Figures 3–7). Students also demonstrated significant improvement in the quality of their reliability statements, with 75 percent of sources having strong justifications for their inclusion in the annotated bibliographies (Figure 8). One particularly impressive excerpt from a spring 2016 student's reliability statement is demonstrative of the improvement between semesters:

> The article was published in 2013 and has a [sic] very clear references (endnotes). It was peer reviewed. The author, Douglas Massey, is the professor of Sociology and Public Affairs at Princeton University. He is also the president of the American Academy of Political and Social Science. The article was published by journal, *Daedalus*, which was published by MIT Press in support of the American Academy of Arts and Sciences.

Though the effectiveness of the instructional modifications reflected in the spring 2016 data is encouraging, the findings are clear that ESL 112 and 115 students struggle most with identifying strong keywords, particularly when searching within the confines of Western-centric databases. Furthermore, though there was a vast improvement in the quality of reliability statements between semesters, students still struggled with choosing articles that were much too long or advanced for their research purpose or correctly identifying the database(s) from which information was retrieved, as Academic Search Complete was often referred to as "The Library Database."

Conclusion

The results of this study provide an important glimpse into first-year international students as they engage in academic research at an American university. The results first provide a much deeper awareness and understanding of the difficulty international students face when completing their initial research assignments. Evidence of the difficulty can be seen in the assessments of both the concept maps and the annotated bibliographies. The challenges inherent in working in a new environment and completing assignments in a language that is not their native tongue were clearly evident. English can be a difficult language. Librarians who work with international students must keep this in mind and have multiple approaches to employ when working with international students. Providing instructional materials in various formats is one strategy that can assure greater meaning for a larger number of students. Second, building partnerships with programs that serve international students on a campus will be invaluable to facilitating change and improving the relationship with the library. In larger institutions these are likely to be academic departments, while in smaller institutions librarians should seek to develop relationships with student service and support offices. These are the people on a campus who work with international students on a daily basis, and building these relationships can help facilitate the role of the library in working directly with international students.

As with other instructional endeavors in a library, building partnerships on our campuses is crucial to

our success. These partnerships allow us to meet the specific needs of international students and they can be instrumental in facilitating change. Librarians must be attentive and responsive to what they see and experience and implement the necessary changes. Understanding the needs of international students will result in the creation of meaningful learning experiences that will extend well beyond the library instruction classroom.

Endnotes

1. "Fall 2015 International Statistics," International Student & Scholar Services, accessed December 8, 2016, http://isss.illinois.edu/download_forms/stats/fa15_stats.pdf.

2. "Open Doors Data," Institute of International Education, accessed December 8, 2016, http://www.iie.org/Research-and-Publications/Open-Doors/Data#.WEnStOYrJPY.

3. "Course Description, ESL 115," accessed December 8, 2016, http://www.linguistics.illinois.edu/students/esl/courses/115/.

Appendix A: Concept Map

Create a Concept Map for Your Topic
ESL 112 | ESL 115

Complete a Concept Map to identify the keywords and concepts you will use when you search for articles about your topic. It can help you identify what you know about your topic and begin to think about your topic in new ways.

To complete your concept map follow the steps below.

1. Write your topic in the box below and circle your keywords or keyword phrases:

TOPIC:

2. Write your keywords in the boxes and list alternate keywords (these will be synonyms).

TO BE COMPLETED IN CLASS:
3. List the subject areas of professionals who are likely to publish articles about your topic. Use the ***UGL Find Articles Guide*** to identify these.
Subject area #1 **Subject area#2** **Subject area #3**

Appendix B: Concept Map Ratings and Criteria

Topic Statement Ratings and Criteria

3: READY

Fully developed. Topic statement is present and (mostly) ready to go.

2: REFINE

In progress. Topic statement is present but requires a bit of focus and/or refinement.

1: REVISE

Not developed or absent. Topic statement is either (a) present, but too loosely defined (e.g., "Obesity in Children," "Skin Cancer," etc.) or (b) not present.

Keyword Selection Ratings and Criteria

3: READY

Database ready. All main concepts with clear relationship to topic identified, and relevant alternative keywords provided for each concept as appropriate.

2: REFINE

Almost database ready. All, or some, main concepts with clear relationship to topic identified and some relevant alternative keywords present, though refinement is necessary for successful database search.

1: REVISE

Not database ready. Main concepts with clear relationship to topic not identified and/or alternative terminology missing or irrelevant

Appendix C: Reliability Statement Ratings and Criteria

3: STRONG

Identified two or more evaluative criteria. For example: information about author credentials, journal focus/coverage, citations, or article content.

2: WEAK

Identified only one of the above criteria examples.

1: INACCURATE

Information based on circumstantial, irrelevant, or incorrect information (the article title, the organization name, etc.).

Developing a Practical Framework for Information Literacy Program Evaluation

Paul Bracke
Gonzaga University, USA

Clarence Maybee and Sharon A. Weiner
Purdue University, USA

Abstract

Purpose. The Purdue University Libraries, like many academic libraries, face increased expectations for demonstrating their value and impact. This has not only led to an expectation of the increased use of metrics to demonstrate impact, but also a more fundamental imperative that libraries more clearly articulate their contributions to educational and research outcomes of their campus communities (value). At Purdue, the provost implemented a new program review process in July 2015, while the libraries were simultaneously going through the process of developing a new mission statement for its information literacy program. This statement was developed through a broad collaborative process within the libraries and with external campus stakeholders. These two developments led the libraries to launch a project to advance an outcomes-based, mission-centric framework for evaluating its information literacy programming that can be sustained over time. The project to develop this framework was predicated on being able to answer the following question, derived from the program mission statement: "Does the Purdue University Libraries' information literacy programming empower diverse learners to use information to learn in transformative ways; lead to the discovery of new knowledge; and foster academic, personal and professional success?" This question not only needs to be answered, but needs to be answered on an ongoing basis to communicate the programming impact to external stakeholders. To be effective, sustainable, and practical, it also needs to be uncomplicated and integrated into regular workflows.

Methods. The methods for developing this framework consist of four steps: (1) focus groups with librarians to collaborate on gaining a more comprehensive understanding of existing assessment practices, as well as their perceptions of challenges and opportunities in assessing information literacy programs, (2) analysis of focus group findings, characterizing current assessment practices and identifying where outcomes-based assessment is already occurring, (3) a gap analysis, comparing focus group findings to the information literacy mission statement, and (4) development of recommendations with measures/indicators to address gaps and develop a comprehensive framework for program evaluation. This paper reports on the first three steps, concluding with suggestions for further development of the evolving framework.

Findings. The assessment practices identified in the analysis of the focus group discussions suggested that librarians assessed how students critically used information to learn more than the other dimensions of the Purdue Libraries' information literacy mission statement: research-based programming, empowerment of diverse learners, enabling the creation of new knowledge, and fostering academic, personal, and professional success. The findings suggest next steps in the development of the framework, including: (1) developing guidelines for collecting assessment data gathered by librarians for use in programmatic assessment, (2) determining assessment strategies for the libraries and allocating resources, and (3) providing professional development and incentives for librarians to create assessment strategies related to all aspects the mission statement.

Practical Implications/Value. We expect that the results of this project will contribute to the body of knowledge in library assessment by presenting a framework for the outcomes-based evaluation of information literacy program evaluation that is based on a strategic perspective on the program, but

that also builds upon existing practices and capacity within the organization.

Introduction

The Purdue University Libraries, like many academic libraries, face increased expectations for demonstrating their value and impact. Because of external drivers related to value, the campus, and thus the libraries, focuses on the undergraduate learning experience and demonstrating the value of these efforts. This imperative is leading the libraries to more clearly articulate their contributions to campus educational and research outcomes, transform their approach to making these contributions, and use evidence to demonstrate impact to stakeholders. Using an approach that recognizes the importance of instructional and research engagement in the broader context of the campus community, the Purdue Libraries moved from ad hoc approaches to instruction to increasing integration into the formalized structures of instruction on campus. This reflects a move away from "one-shot" instruction to deeper engagement in courses and curricula and systematic involvement in campus curricular transformation. At the same time, articulation of the libraries' instructional program has become increasingly structured. This resulted in the development of a new information literacy mission statement, intended to better articulate the goals and potential impact of libraries instruction to the campus:

> Purdue University Libraries' research-based information literacy programming empowers Purdue's diverse communities of learners to use information critically to learn and to create new knowledge, fostering academic, personal, and professional success. (https://www.lib.purdue.edu/infolit/mission)

Although aligned with the libraries' strategic plan, information literacy programming was largely a bottom-up process of building structure around existing, successful practices that were the outgrowth of a focus on engagement and partnerships. This led to an ad hoc approach to information literacy assessment, inconsistently carried out at the individual student level with little programmatic evaluation beyond the requirements of external reporting such as ARL Statistics. It was clear that improving program evaluation and assessment would be necessary to continue to develop and improve the libraries' information literacy efforts. At the same time, the provost implemented a new program review process. These developments led the libraries to launch a project to develop an outcomes-based, mission-centric framework for evaluating its information literacy programing that can be sustained over time. The project to develop this framework was predicated on this question, derived from the program mission statement:

> Does the Purdue University Libraries' information literacy programming empower diverse learners to use information to learn in transformative ways; lead to the discovery of new knowledge; and foster academic, personal and professional success?

This question needed to be answered for two reasons: (1) so that the libraries would continuously evaluate and communicate their effectiveness and programmatic impact to external stakeholders; and (2) so that the libraries' faculty and staff could improve their practices through evidence. A framework approach was chosen so the practices could be coordinated from the top down to meet organizational needs while still honoring existing practices and providing space for innovation and customized practice. To use a music metaphor, we were not attempting to compose a symphony but were rather trying to develop jazz charts—a structure that coordinates the ensemble but still showcases creativity and spontaneity. The intention of the project was to develop and implement a framework for programmatic evaluation that met the internal and external evaluation needs of the organization as a whole. At the same time, it allowed individual practitioners to develop innovations that could be piloted and eventually integrated into the larger framework, or simply used to improve individual practice.

Literature Review

Academic libraries have a long history of collecting data for assessment. Input data such as gate counts and circulation statistics sufficed for reporting purposes in the past. But there is widespread acknowledgement that input data do not capture the breadth or depth of how libraries influence students and faculty. Librarians, individual libraries, and professional associations are developing new assessment strategies, but there is no agreement on a method or model for assessing academic libraries. Koltay postulated that "impact assessment is a field in its infancy for research libraries."[1] Professional

associations have programs to support libraries in their efforts. The Association of Research Libraries Statistics and Assessment program (http://www.arl.org/focus-areas/statistics-assessment); the American Library Association Libraries Matter: Impact Research (http://www.ala.org/research/librariesmatter/); the Association of College and Research Libraries VALUE of Academic Libraries initiative (http://www.acrl.ala.org/value/); and much of the focus of SLA (https://www.sla.org/career-center/helping-organizations-succeed/; http://www.sla.org/wp-content/uploads/2014/03/FT-SLA-Report.pdf) reflect this. Demonstrating impact should be communicated to constituencies, but a study of members of the Association of Research Libraries found that few reported assessment data on their websites.[2]

Accountability to the institutional administration is one purpose of programmatic assessment. But there are other benefits to assessment, such as program improvement and the development of teaching theory.[3] Individual librarians assess information literacy and student learning at the individual or class level. However, only a few libraries addressed the information literacy ***program*** as the unit of measure or evaluated the impact of the information literacy program in the literature. The institutional mission should be the foundation for library assessment.[4] According to ACRL, a mission statement and assessment that includes program performance are best practices for information literacy programs. Program evaluation should include measurement of the progress of meeting the program's goals and objectives; and assessment of integration with course, curriculum, institutional, and accreditation assessment.[5] "Without this broader perspective, we may create projects and services that are excellent on their own yet disconnected from a more comprehensive approach... Assessing a library's information literacy efforts on a programmatic scale provides a pivotal opportunity to ensure that those engaged in information literacy instruction, as well as library and university administrators, are best positioned to support the myriad elements that make up a successful information literacy program."[6]

One program incorporated the ACRL "Characteristics of Best Practices of Information Literacy Programs" in a survey of librarians to assess their information literacy program.[7] Gewirtz described an evaluation that included peer-to-peer feedback, student feedback, and self-reflection.[8] The evaluation at Cornell's Mann Library included an attitudinal assessment that considered user satisfaction; an outcomes-based assessment of a sample of first-year students; and a gap assessment that examined the difference between the perceptions of the importance of workshop content by the instructors and the students.[9] The University of Central Florida based its evaluation on its alignment with the institution's mission.[10] Goebel et al. reported on the assessment practices for 21 discipline-specific information literacy courses at Augustana, considering that a program assessment.[11] Few of the citations in Brown and Niles' bibliography on information literacy assessment, which covered the period from 2007 to 2012, or Hufford's review of academic library assessment, which covered 2005–2011, included articles on program-level assessment.[12]

Program evaluation is a method of assessment that focuses on the effectiveness of an overall program. Typically, the evaluation employs more than one method and is based on the anticipated outcomes of the program. It is well suited for academic libraries as the goal of program evaluation is to improve the program.[13]

There is a need for a general framework for information literacy program evaluation that considers three factors: (1) the library's need for assessment for reporting and improvement purposes, (2) drivers for assessment that are external to the library, and (3) the assessment that already occurs by those teaching information literacy in the library.

The Model

Based on the review of the literature and knowledge of our local drivers, the project team developed a preliminary model (Figure 1) for developing a coherent approach to the evaluation of instructional activities. It is a general framework for identifying and articulating assessment needs which takes into account drivers, often interrelated, at organizational levels (unit and university goals) and individual levels (learner outcomes, instructor outcomes). Therefore, the model began with the two boxes on the outside. "Instructor/Learning Individual Outcomes" represents the learning outcomes of learners and the professional development needs of librarians and faculty related to teaching. This is an acknowledgement that assessment is intended to improve the outcomes and practices of individuals. "Administrative Goals," at the top, represents the strategic and operational goals set by the library

as an organization and the university as a whole. These are connected by arrows to indicate the interrelationships between administrative and individual goals. For example, administrative goals to improve graduation rates may influence the development of learning outcomes in the curriculum. Conversely, student performance on specific learning outcomes may shape administrative goals at the unit or campus level.

Figure 1. Proposed Framework for Information Literacy Programming Assessment

The model then proposes using a mission-based framework for both classifying existing assessment practices and identifying areas of opportunity and need. The model rests upon two assumptions: (1) that a library's mission, and by extension that of its instruction program, reflect the aspirations and current practices of the library in relation to the larger mission of the institution, and (2) that goals at the institutional level are aligned with the institutional mission. Furthermore, these goals are instantiated at two levels—organizational and individual outcomes. Therefore, assessment programs that are based on the mission of the library or its instructional program should support assessment of the library's contributions to institutional mission at multiple levels. The proposed model is a framework for a coordinated assessment program that allows for individual innovation while providing a structured approach to evaluating activities and outcomes according to the intent of the library and broader institution.

The research questions were: What is a model for the evaluation of information literacy programming that integrates existing information literacy assessment practices and external drivers for accountability? Could the model provide an effective framework for evaluating information literacy programs? Project members sought to evaluate the model using the Purdue Libraries as a case study for testing, before developing recommendations for further development locally and further evaluation at other institutions.

Methods

The methods for developing this framework consisted of four steps: (1) focus groups with librarians to collaborate on gaining a more comprehensive understanding of existing assessment practices, as well as their perceptions of challenges and opportunities in assessing information literacy programs, (2) analysis of focus group findings, characterizing current assessment practices and identifying where outcomes-based assessment is already occurring, (3) a gap analysis,

comparing focus group findings to the information literacy mission statement, and (4) development of recommendations with measures/indicators to address gaps and develop a comprehensive framework for program evaluation. This is because "a variety of approaches are necessary to assess the degree to which institutions achieve student learning."[14] Because the framework would address more than input measures, it would need to include qualitative studies: "The more a program moves beyond training in standard basic competencies to more individualized development, the more qualitative case studies will be needed to capture the range of outcomes attained."[15] This paper reports on the first three steps, concluding with suggestions for further development of the evolving framework.

Organizational issues that might have occurred were prevented by: (1) emphasizing that the project was to examine information literacy assessment at a program level, and was not assessing individual librarians or students; and (2) involving librarians through focus groups and requesting feedback on the framework and recommendations.

> The crucial distinction between aggregate outcomes assessment of a group effort and individual instructor evaluation must be made clear to all involved parties from the outset, as the lack of such can prove problematic to both the investment of instructional librarians and the involvement of teaching faculty. It cannot be overemphasized that information literacy instruction outcomes assessment is not about measuring the effectiveness of either individual library or course instruction or instructors; it is, rather, an incremental cycle focused upon continuous improvement with the emphasis always upon cumulative student learning.[16]

Focus Groups

The investigators conducted nine focus groups with three to four people in each, including all members of the libraries' faculty who agreed to participate. There were a total of 22 participants. Each focus group was scheduled for 1.5 hours. The same investigator asked questions during each focus group and another investigator took notes on the discussions. They asked:

1. In teaching and learning situations, how do you know that people are learning what you intend them to learn?
2. Have you worked with faculty, staff, or teaching assistants in other departments to integrate the use of information into their instruction?
3. How do you evaluate the outcomes of those efforts?
4. What do you think would be the ideal way for you to evaluate whether people are learning what you want them to learn?
5. What would help you to develop this type of evaluation?

Analysis of Focus Group Findings and Gap Analysis

One investigator coded the notes from the focus groups to identify areas in which assessment occurred and what the respondents felt was missing in their assessments. The findings from the analysis of the focus group discussions were compared to the key aspects of the libraries' information literacy mission statement: research-based programming, empowerment of diverse learners, enabling the critical use of information to learn, enabling the creation of new knowledge, and fostering academic, personal, and professional success.

Findings

Current Assessment Practices

The library faculty who participated in the focus groups collectively described thirteen activities through which they fostered learning:

1. Online content, (e.g., webpages, guides, etc.)
2. Student outreach (e.g., orientations, etc.)
3. Faculty outreach
4. Labs
5. Students consultations
6. Online tutorials
7. Workshops
8. Class visits (i.e., one-shots)
9. Graduate Assistant mentoring
10. Independent study
11. Embedded
12. Faculty Consultations (i.e., to integrate IL into coursework)
13. Semester-long course

The participants described 11 different methods for determining if learning resulted from their teaching efforts. Table 1 shows how the participants described whether they were meeting their teaching intentions. One way was input from the course instructor with whom they worked. Another was signs of engagement of the learners. Last was learner

performance, such as classroom interactions, tests, and final projects.

Table 1. Evidence Used to Evaluate Teaching and Learning Effort

Instructor Input	Learner Engagement	Learner Performance
• Instructor feedback (on class visits) • Use in courses • Invitations	• Number of learners reached • Usage of materials • Follow ups • Feedback	• Classroom interaction (monitoring classroom discussion to gauge comprehension) • Learning activities • Assessment artifacts (e.g., projects, papers, etc.) • Future actions (e.g., successful conference submissions)

The participants discussed five learning activities that they evaluated based on feedback from course instructors or facilitators of an activity or by learner engagement: (1) providing online content, (2) outreach efforts for students, (3) outreach efforts for faculty, (4) working with a student lab, and (5) student consultations.

In contrast to activities that were evaluated using input from the instructor and student engagement, determining the success of online tutorials, workshops, and class visits (one-shots) also involved evaluating student performance. In two of the focus groups, participants discussed a project in which students received online badges for completing a mandatory online information literacy tutorial. Participants in four of the focus groups described workshops. Participants in four of the focus groups identified ways of determining the success of workshops: invitations to do the workshop again; feedback collected from attendees; monitoring interaction during the workshop; and examining work that attendees completed.

Participants in all nine of the focus groups participated in class visits ("one-shots"), the mainstay of the instructional efforts, and described eight assessment activities. These included invitations to conduct additional sessions; getting feedback from the course instructor; use of online materials; surveys; student follow-up; student questions; and evaluating student work, such as class projects.

When the participants had autonomy over the evaluation, their assessment practices included examining learner engagement and performance, but did not include gathering input from another instructor. These instructional activities included mentoring of student workers; overseeing independent studies; embedding in a course; consulting to integrate information literacy into a course; and teaching a semester-long course. The participants in one focus group described mentoring graduate students hired by the libraries. They assessed this through performance of workplace tasks and scholarly output, such as journal articles and grants related to the student's library work. Similarly, one participant described overseeing a student's independent study and evaluating learning by the student's ability to perform in future endeavors.

One participant discussed embedding in a course in which he attended most or all of the class sessions and worked with students as they completed projects. The participant reviewed all of the student work and informally advised the instructor on the quality of student use of information and other aspects of the work. Participants in six of the focus groups discussed working with faculty, lecturers, or teaching assistants to integrate information literacy

or other educational ideas into their teaching. The assessment practices included counting the number of students reached through the course; instructor feedback; and performance (i.e., gauging instructor understanding of the concepts introduced and tracking how the instructor applied what they learned).

Participants in six of the focus groups also discussed assessment practices when teaching or co-teaching semester-long courses. They included student feedback and follow up, learning activities, and student work. In contrast to class visits in which student work tended to be in-class exercises or homework assignments, assessment in semester-long courses spanned a range of work that included final projects, papers, and examinations.

Ideal Assessment Practices

Participants identified assessment practices they would use in an ideal situation to evaluate learning and what support they would need to implement such practices: (1) experimental, (2) pre-post, and (3) longitudinal designs. One participant intended to analyze papers from an advanced course to compare the work of students who had taken an information literacy course with those who had not. Another suggested having students take a pre- and post-test at intervals to determine the effectiveness of particular interventions and growth across a curriculum.

Library faculty in five of the focus groups identified longitudinal assessment efforts as ideal for showing long-term impacts. Some suggested using a tool to track student achievement unobtrusively after information literacy instruction or posing questions in exit polls or alumni surveys. One described using institutional data to assess the impact of her instruction on student achievement. The participants identified the development of standardized processes as needed support for assessment.

Participants emphasized access to student work and feedback as necessary for implementing preferred assessment strategies. One focus group identified time in the classroom as key and suggested that this requires subject expertise. They thought that partnerships with individual faculty or departments to develop assessment was ideal and suggested the need for support to encourage these. One participant suggested the need for department-level assessment in which faculty define their goals for students' research skills and determine if students are meeting their goals.

Four of the focus groups mentioned needing time and staff support to implement assessment strategies such as statistical analysis.

Gap Analysis

Librarians at Purdue are engaged in teaching and learning activities related to the different aspects of the libraries' mission statement: research-based programming, empowerment of diverse learners, enabling the critical use of information to learn, enabling the creation of new knowledge, and fostering academic, personal, and professional success. However, the assessment practices identified in the analysis of the focus group discussions suggest that librarians are assessing some aspects of information literacy much more than others. Most of the discussion in the focus groups centered on assessing how students are able to critically use information to learn.

Although only a couple of the librarians described conducting research to inform information literacy efforts, the authors are anecdotally aware of additional information literacy research projects that were not discussed in the focus groups. This suggests that the librarians may not view these activities in relationship to their assessment practices. There was no suggestion in the focus groups that librarians teach or create assessments related specifically to empowering diverse learners. The references to teaching and consulting activities which emphasized the creation of new knowledge were primarily focused on data management and scholarly communication. Often occurring outside of curricular efforts, assessment efforts typically focus more on indicators such as learner feedback, rather than learner performance.

Librarians were very concerned with assessing how the libraries' information literacy efforts enable learners to successfully use information in future academic, personal, and professional settings. However, they are engaged in few assessment practices related to this aspect of the mission statement. Librarians' suggestions for collecting data to assess the impact of the libraries' information literacy efforts on learners' future endeavors were tied to existing university efforts to explore alumni views of their undergraduate experiences at Purdue.

Further Development of the Framework for Program Evaluation

In the initial phase, the findings from the focus groups suggest elements to focus on to further develop the assessment framework. The findings highlight the need for the librarians at Purdue to expand their assessment practices to include aspects of the information literacy mission beyond critically using information to learn. Librarians need to directly relate their information literacy research efforts to their teaching and assessment practices. They also need to assess their efforts related to empowering diverse learners. Pursuant to these goals, the libraries recently hired a faculty member with responsibilities for enabling librarians to reach diverse groups within the university, as well as guide librarians in assessing these efforts. Librarians also need professional development to help them to identify and develop assessment strategies for their work related to enabling the creation of new knowledge, and fostering academic, personal, and professional success.

In addition to considering assessment data collected by librarians for use in programmatic assessment, the findings from the focus groups suggest the need for larger-scale assessment efforts to be undertaken by the libraries, such as gathering alumni data to explore the value of the information literacy efforts they engaged in while at Purdue. Next steps in the development of the framework focus on:

- developing guidelines for collecting assessment data gathered by librarians for use in programmatic assessment,
- determining assessment strategies that may be undertaken collectively by the libraries and allocate resources, and
- providing professional development and incentives for librarians to create assessment strategies related to all aspects of Purdue Libraries' information literacy mission.

Conclusion

Assessment needs to be customized so that it is "appropriate for their instructional programs and their institutional environment, meshing their efforts with local assessment practices and expectations."[17] However, institutions need to compare with those who are peers or aspirational. The framework developed for this project meets both of those criteria: customizable and comparable. This assessment included important components that Oakleaf outlined:

- "articulate the purposes of assessment,
- reveal the theoretical underpinnings of assessment efforts,
- list information literacy goal and outcome and align them with other institutional documents,
- describe the assessment methods and tools used to gather evidence of learning,
- capture and report assessment results, and
- emphasize the improvements made to teaching, learning, and future assessments."[18]

The approach described in this paper is one that can meet these multiple needs as it is developed further. It provides a structure for considering assessments at multiple levels. At the organizational level, it provides a structure for developing assessments that evaluate the performance of libraries on their strategic goals. Meanwhile, at an individual level, it provides flexibility for individuals to engage in innovation, both in assessment and instruction, within the larger organizational context.

We expect that the results of this project will contribute to the body of knowledge in library assessment by presenting a framework for the outcomes-based evaluation of information literacy program evaluation that is based on a strategic perspective on the program, but that also builds upon existing practices and capacity within the organization.

Paul Bracke, PhD
Dean, Library Services
Gonzaga University
bracke@gonzaga.edu

Clarence Maybee, PhD
Information Literacy Specialist
Purdue University Libraries
cmaybee@purdue.edu

Sharon A. Weiner, EdD
Interim Associate Dean for Academic Affairs
Professor and W. Wayne Booker Chair in Information Literacy
Purdue University Libraries
sweiner@purdue.edu

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Appendix 1. E-mail Participant Recruitment Message

This is the message e-mailed to Purdue Libraries faculty:

"Dear Libraries Faculty,

In response to the Provost's request that campus units report indicators of achievement and growth, Paul Bracke, Sharon Weiner, and I are developing an evaluation of our Information Literacy programming. The purpose of the evaluation is to determine programmatic effectiveness and identify areas in which we could improve. Information Literacy programming includes all aspects of IL supported through the Libraries, including data literacy and copyright.

We are starting by gathering baseline information. We invite each of you to participate in focus groups of 3–4 people each. The purpose of the focus groups is to learn how you determine whether your students have learned what you wanted them to learn. **We are not gathering information to assess Faculty or students individually.** We intend to aggregate the data we collect to get a broad view of information literacy assessment done through the Purdue Libraries. We will schedule 1.5 hours for each focus group. Please let me know by [date] whether you are willing to participate in this important exercise.

Thank you in advance for your help in this important work!

Dr. Clarence Maybee

Information Literacy Specialist, Assistant Professor"

Usability Study of Database Accessibility for Students Who Use Screen Readers

Nicole Campbell
Washington State University Vancouver, USA

Navigating the research process and accessing scholarly resources can be challenging for many students. Those who use screen readers to access information have an added layer of complexity to their information seeking. While librarians have developed services to support students with print disabilities, it is often not clear the exact nature of the research process these students experience and how that experience compares to students who do not use screen readers. In order to better understand the research experience of students with print disabilities and to develop better services to support these students, two librarians at Washington State University Vancouver embarked on a usability study of database accessibility. This paper will highlight some of the things we learned during this project.

Background

Two students who use screen readers contacted our library for assistance in using library resources to find scholarly articles. These students arranged individual times with reference librarians and brought their laptops with them so that they could use their screen readers while working. We helped these students find what they needed as best we could but noticed several important things.

First, the research process was incredibly time-consuming for the students and not the independent experience they wanted or deserved. Our library services are designed to support students through their research process, providing instruction as needed so that students can develop their critical thinking skills and become more confident and independent with their research skills. These two students were definitely not feeling confident or independent in their use of library resources.

Second, our reference librarians have no (or very limited) experience with screen readers. They struggled to understand what was happening with the research experience for these students and how best to help without doing their research for them. It was obvious there were problems and that students were frustrated but it was not obvious what the problems were. The librarians could not tell whether the issues were related to students' competency with the screen reader software, related to conflicts between screen readers and database interfaces, or related to information literacy skills. The librarians were definitely not feeling confident in their abilities to help these students.

Finally, it was clear that this situation was not sustainable. The librarians had experienced the same issues and frustrations in the past while helping students with print disabilities, and, unless something changes, are likely to experience the same issues going forward. We want to make sure we are serving all of our students equitably and we want that experience to be positive, not the frustrating experience it was proving to be for students who use screen readers. And we want our librarians to feel confident in their ability to support all of our students. Something needed to change.

Information Gathering

Though we suspected that the major issues for students with print disabilities were related to the interaction between screen readers and database interfaces, it was important to gain a broader understanding of these students' research experiences. We started by gathering information in two ways: consulting experts in our community and consulting the library literature to see what other librarians were saying.

Consulting experts in our community was a good way to learn about the training and technologies our students encounter on their way to us. In particular, we wanted to understand what types of adaptive technologies are typically used and what types of training students receive. We began by talking with our campus Access Center to learn about the technology and services available to students on campus. Next, we visited the School for the Blind where we learned that the focus is on teaching students to live independently. Training related to

screen readers was fairly limited and not specific to information seeking skills. Then, we spoke with staff at the Disability Center at Clark College, our local community college, where we learned that Clark students were also struggling to use screen readers to search databases, and, though services were available to help, more accessible interfaces would make things easier. Finally, we also consulted the Department of Services for the Blind in Seattle, Washington, to get a tour of the many adaptive technologies they provide training on, and we consulted Dr. Richard Ladner at the University of Washington who has done extensive research with students who have print disabilities. All of this gave us a better idea of the types of technology, training, and services our students typically experience. It also reinforced for us that the types of issues we observed as our students struggled were not unique to our library.

Consulting the library and information science literature helped in understanding what librarians had already learned related to accessibility. Numerous articles offered suggestions for supporting students who use adaptive technologies. Because of our interest in databases, though, we looked closely at research related to database usability and accessibility. Heather Hill, whose content analysis of library and information science literature from 2000–2010 provides a good synopsis of the literature, found that most articles focus on technology.[1] Many authors look at accessibility by using a variety of methodologies to study compliance with web standards, such as Byerley and Chambers; Tatomir and Durrance; Stewart, et al.; and DeLancey.[2] Several conducted task-based usability evaluations; Stewart used six sighted participants and Byerley used two legally blind participants.[3] Dermondy and Majekodunmi evaluated database usability specifically focused on "the research process of a small sample of ten Canadian university students with print disabilities who use screen readers to access information online."[4] They used a task-based usability process with 10 participants with print disabilities and were looking specifically at the research process and experience of students who use screen readers.

Usability Testing

Usability focuses on the interaction between someone and an interface, looking specifically at how easy it is for someone to accomplish the tasks that interface was designed for. There are many attributes that contribute to usability (including efficiency and errors[5]) and numerous ways to assess usability (including first-click testing, eye tracking and task-based usability).[6] With the task-based methodology, participants work through a series of tasks with an interface while researchers observe. Oftentimes, participants are also asked to think aloud as they work so that researchers can gain more insight into their experience.

Based on everything we learned during our information gathering process and knowing that we needed to understand more about what our students were experiencing, we decided to conduct our own usability study modeled on the study by Dermondy and Majekodunmi. The task-based usability methodology was appealing because it provided an opportunity to observe participants as they interacted with scholarly databases. Additionally, we had conducted numerous usability studies in our library over the years so we were already familiar with various ways to evaluate the usability of websites and catalogs.

Our Project

Our usability study used a task-based process. We recruited 20 participants. Ten of these were students with print disabilities who use screen readers to access information. The 10 remaining participants were students who do not have print disabilities and do not use screen readers. We hoped that having two groups of participants would help us identify if problems were specific to screen readers or were broader in scope. Additionally, having two groups would help with understanding differences in information seeking strategies for those using screen readers as compared to those who do not.

Three different database interfaces were selected for the study. We chose to include different interfaces so that we could try to determine if issues were unique to a specific interface or if they were larger problems. In each database, participants were asked to complete one task: search for, and access, one full text journal article on a given topic. Finding journal articles is a common task for most students and is the reason libraries provide access to so many databases. So, it seemed an obvious task for our study.

The testing was done on laptops we provided; one was a Windows laptop and the other a Macintosh. Three different screen readers were available for participants to choose from: JAWS, NVDA, and

Voice Over. Participants had their choice of laptop, screen reader, and browser and could customize the software to their liking. Additionally, Camtasia was used to record the laptop screen and participant voices. Observers kept notes and prompted the participants to think aloud.

Some Observations

There is a lot of data to work through as we consider different database interfaces as well as comparisons between the two groups of participants. However, when considering the research experience of students with print disabilities who use screen readers, three observations stand out.

First, there were many problems related to PDF documents. Seven of the ten participants who use screen readers encountered problems with a PDF. Some of the PDFs were simply inaccessible and screen readers could not read them at all; some could be read one word at a time. Sometimes switching browsers helped; sometimes downloading and using alternate software to open the PDF worked. Overall, accessing PDFs was inconsistent and problematic. This is especially troublesome because PDFs are a common format within databases for providing full text content.

Second, participants using screen readers encountered far more usability issues than those not using screen readers. The screen reader group faced about thirteen unique usability issues, many of which were seen repeatedly. These issues had moderate to significant impact on the participants' ability to complete tasks. The group not using screen readers encountered five unique issues, some of which were seen repeatedly. The issues for this group had minor impact on their ability to complete tasks. Overall this means that database usability is substantially impacted for those who use screen readers.

Third, the amount of time to complete tasks was much longer for participants using screen readers. This group averaged about nine minutes to complete each task as compared to an average of four minutes for the group not using screen readers, a significant difference in efficiency. This was directly connected to the issues with PDFs and higher number of usability issues. Figuring out how to open PDFs, working through different usability issues, and simply having to listen to large chunks of content on each page all lengthened the amount of time it took for the screen reader group to complete tasks. This group exhibited a great deal of patience and perseverance as they worked through each task.

Overall, students with print disabilities who use screen readers encountered more usability issues, were unable (or struggled) to open PDFs, and took longer to complete tasks. These issues directly impacted the usability of the database interfaces we evaluated and in particular influenced the usability attributes related to efficiency and errors. More significantly, these three observations highlight significant issues these students face with their research process, adding layers of frustration and complexity to information seeking activities.

Accessible Assessment

Because this study included participants with print disabilities, it was important to make sure the research process itself was accessible. Several things needed to be considered.

Recruitment materials needed to be in accessible formats. In the past, much of our advertising was in print format: flyers and posters placed around campus and advertisements in the student newspaper. However, this does not work for participants with print disabilities. Expanding our recruitment strategies to social media and connecting with community and student groups helped with recruitment efforts.

Every online and physical space that participants encounter during the study needed to be accessible. In our study, we initially used an online survey tool to collect demographic data but quickly learned that this tool was difficult to use with a screen reader and added more complexity to the study than we wanted. In this case, we eliminated the online survey tool so that participants only encountered the interfaces we were studying.

Libraries, including ours, are always embarking on assessment projects of various types. It is important to consider accessibility when designing, recruiting, and implementing assessment projects so that we are learning from all library patrons.

Going Forward

As a way to make things better, we are starting by sharing our observations with our own librarians and with the wider library profession. Understanding the bigger issues faced by those who use screen readers to access information can help us all develop better

services to support these students. Developing ways to make PDFs accessible, scheduling longer times for reference consultations, and expanding our knowledge of adaptive technologies will all help in supporting these students. However, more can be done.

More research should be done to build on what we already know. As more and more library resources go digital, research into how different users interact with these resources is essential. Also, we need to add accessibility into our purchasing decisions, if it is not already a consideration. Libraries spend a lot of money on these various online interfaces; we should insist that these are accessible for all our patrons.

Finally, it is important to share with the library community what we are learning and doing. We should talk about what our patrons are experiencing and how we are supporting them. Keeping accessibility and usability as part of our on-going conversations will keep us all moving forward.

Final Thoughts

This research project was born out of a desire to better serve all of our students, especially after seeing the frustration students with print disabilities had while conducting research and the frustration reference librarians had in not being able to better support these students. Through this project, we better understand the research experience of these students and that understanding helps us build better services to support them. We hope sharing this information will help others.

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Beyond Data Management: Designing User-Driven Data Services at UCSF Library

Ariel Deardorff
University of California San Francisco, USA

Abstract

As the biomedical sciences grow more data intensive, scientists and researchers are increasingly being expected to work with larger, more complicated datasets. UCSF Library, the only library on the health sciences campus, wanted to expand its data services to ensure that the university's students, staff, and faculty were prepared to work with their research data throughout the data lifecycle. Because this was a relatively new area for the library, the data services team decided to assess the data needs of the university in order to determine which programs they should offer. The data needs assessment relied on a mixed methods approach combining informal community feedback with focus groups. As the goal was to let the community guide the creation of a new service, the data services team used open-ended questions to reveal service gaps and data challenges, as well as resources and tools that the UCSF community desired. Findings indicate that the UCSF community is very interested in workshops and classes on programming with R and Python, as well as data organization and assistance finding open datasets. The findings of this needs assessment will help the UCSF Library's data services team design and prioritize new programs.

Data and the Biomedical Sciences

It is no secret that biomedical and health science research is more data-intensive than ever before. On the basic science side, researchers now have the ability to analyze large genomic datasets to reveal the cause of diseases at the molecular level. On the clinical side, researchers are turning to electronic health records as a source of patient data that can be mined for insight into how diseases spread and are cured. In order to be proficient in these new areas, researchers are increasingly required to have programming or other technical skills in order to run large-scale analyses, query large datasets, or mine patient data.

As biomedical research data becomes increasingly complex, funders like the National Institutes of Health are putting pressure on researchers to properly manage and share the data they collect, recommending data management plans and requiring certain kinds of research data (including human genomic data) be deposited into publically accessible data repositories.[1] On the publishing side, journals like *PLOS*, *Science*, and *Nature*, have created data sharing policies[2] that require researchers to make the data underlying their publications openly available. These data policies and requirements put new pressures on researchers to properly document, track, organize, and store their research data.

UCSF Library

The University of California San Francisco is a graduate only, health sciences university that includes four professional schools (dentistry, medicine, nursing, and pharmacy) and 17 biomedical graduate programs. In addition to the 3,100 enrolled graduate students, UCSF serves more than 1,500 clinical residents, and 1,600 postdocs.[3] As a research-intensive university, UCSF is particularly affected by the growing data-intensive nature of the sciences. While current graduate students may have topics like programming and database design built into their coursework, many of the university's postdocs, faculty, and staff were never taught these essential skills, and are constantly playing catch up in order to be effective researchers.

The UCSF Library, as the sole library on the UCSF campus, saw this lack of data-related skills as an opportunity for the library to offer essential services not provided elsewhere on campus. To ensure that new programs or services truly fit the needs of the UCSF community, library management decided to enlist the help of the assessment librarian to perform a data needs assessment.

Methods

The data needs assessment was originally designed to have a mixed methods approach consisting of

three stages. First, an informal idea-generating stage consisting of pop-up whiteboards around campus, then a formal survey to solicit campus-wide feedback, and finally a series of focus groups in order to gather feedback on potential service models. Once the project was launched it soon became clear that the chosen assessment methods were not well suited to the kinds of information and feedback that was desired. The initial idea-generating stage—which consisted of white boards and easels with questions like "What is your biggest data challenge?" and "What tools would you like access to at UCSF?"—generated only a few superficial answers (i.e., "too much stuff" and "not enough money"). This was surprising as the whiteboards were prominently located at places where people often congregate and were likely seen by many people. After trying different versions of the questions and various locations around campus, the assessment team decided that these kind of questions required more reflection than could be demanded of someone waiting in line for their coffee. Unlike answering a simple yes or no question, the whiteboard questions required respondents to think deeply about their workflows and research processes. The lack of response might also have been due to the competitive nature of UCSF, where people might feel uncomfortable describing their research challenges in a public forum. In order to get the truly rich information that they were looking for, the assessment team decided to proceed to the focus group stage of the project.

Because the assessment team thought that people would be more willing to participate in informal gatherings, they designed the focus group as informal "data discussions," where the goal would be to meet with various groups on campus (over lunch) to learn more about their research data needs and challenges. During the focus groups two members of the assessment team met with groups of between one and three people and asked them to describe their research. Participants were asked to talk about the structure of a typical day, who they collaborated with, the kinds of data that they worked with, and what kinds of tools and services they used. One of the team members took notes and the other listened carefully to the speakers and prompted them to elaborate on any frustrations or challenges they described. The format of the informal focus group worked particularly well in this situation as the relaxed small-group setting made participants feel comfortable sharing their struggles and allowed them to build off of each other's remarks. In all, the team met with three faculty members, five research staff, one graduate student, two postdocs, and two clinical research fellows.

Findings

The needs participants shared in the data discussions touched on all of the different aspects of the research lifecycle and can be summarized as difficulties with collecting data, processing/analyzing data, storing data, documenting data, and sharing data.

Collecting Data

Most of the participants that worked with clinical data specifically mentioned the difficulty of extracting data from APeX, UCSF's electronic health record system. A research staff member shared that they never knew what was in the system and what could be extracted, while another staff member told the group about the difficulty of extracting the same data each time the system was queried. Those who were not using UCSF data were not any better off; one faculty member told us it had taken months to receive data they had requested from the California Department of Health, a delay that severely impacted the timeline of their research project.

Processing/Analyzing Data

The comments related to processing and analyzing data often spoke to a lack of expertise in statistical tools and programming languages that made it hard for researchers to clean and analyze data on their own. A faculty member shared that their lab runs all experiments in R (programming language) and it can be a high bar for new grad students who often come in with little to no exposure to the language. Another theme that emerged was the frustration with MyResearch, UCSF's virtual research environment. At least four participants specifically told us how much they dislike using MyResearch and one clinical fellow even said it would be easier to drive across town and hand deliver a dataset rather than trying to upload and share it via the tool!

Storing Data

Participants who worked with clinical data were especially frustrated with the tools available to them for storing their data in HIPAA-compliant environments. Research staff and faculty members shared that restrictions on cloud-hosted software have led them to FedEx external hard drives and store confidential information in their (secure) e-mail inbox. What is more, data storing restrictions

make it harder to manage datasets within labs and with collaborators at other universities and in industry.

Documenting Data
Documenting data was a challenge that almost every participant discussed. The assessment team heard about labs where everyone organizes and describes their datasets differently, and where standards and protocols are passed down almost as an oral tradition. Postdocs talked about attempting to build on the data of a former lab member and not having any metadata or documentation to tell them how the experiments were run or what analysis was already performed. A grad student who had been in several labs reported that every lab was different and that it was necessary to rely on other grad students and postdocs to figure out the various system and protocols.

Sharing Data
Data sharing requirements are still relatively new and therefore were not on the radar of many of the participants. Those who had been required to share their data complained about how much time it took to reformat their datasets to meet the file formats and standards of their intended repositories. Other faculty knew they were supposed to share but reported that no one really did because there were not yet any real penalties for not sharing.

New Library Services

The data discussions gave the assessment team insight into several areas of need related to research data. While the library could not address all the issues raised in the meetings (MyResearch and APeX are not run by the library, for example), it could expand its educational offerings in areas like programming, data organization and storage, and data sharing. Since the needs assessment was conducted, the data services team has recruited instructors from inside and outside the library to offer quarterly Software Carpentry R/Python programming workshops along with monthly R/Python work sessions to provide opportunities for people interested in improving their programming skills. These workshops have been incredibly popular; registration for the first four sessions filled up immediately and there are often more than 40 people on the waitlist. On the data storage side, the library is currently planning an SQL workshop that will teach participants how to work with databases. In order to highlight tools for data organization and documentation, the library recently held an electronic lab notebook fair that was attended by over 45 researchers from across the university. While the library has yet to address the unique data challenges of clinical researchers, there might be an opportunity to partner with MyResearch and APeX developers to share feedback or even just offer training and orientations on those tools.

Although the data discussions did reveal real areas of need on campus, there were only 13 participants, and there are likely several other issues that were not discussed. The data needs assessment must therefore be a continual process to ensure that the library's offerings are consistent with campus needs. Ongoing assessment strategies include measuring attendance at workshops and classes, monitoring requests for new classes, and continuing to engage with campus discussions around research data.

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OBILLSK: Using Predictive Analytics to Anticipate Interlibrary Loans

Ryan Litsey, Scott Luker, and Weston Mauldin
Texas Tech University, USA

Abstract

The methods of assessment used by academic libraries have evolved to include a variety of methodologies and outcomes. Until now assessment has been under the purview of research methods and is usually survey based. Developments in technology and computing power have led to new types of computational power that can harness cutting edge algorithms to open new avenues of research. These avenues are predictive analytics and machine learning. Harnessing computer algorithms can lead to an assessment that not only occurs in near real time, but also creates a system that can respond to patron preferences at a moment's notice. Our paper seeks to describe how these types of technology can be designed using everyday library questions. We also demonstrate the potential power these types of assessment can have. It is the hope of the authors to begin a discussion of a new type of assessment, one that does not rely on static data, but rather modern computer power to provide assessment as patrons interact with the library, creating a data biosphere instead of statics-assessed data.

Assessment continues to play a large role in the academic library. Libraries use assessment for a variety of reasons—everything from budget justification, collection decisions, instructional ideas and several others. What is important in assessment above all else is data collection. Data collection can take on a variety of formats. Data could be gathered statically by data gathering software like circulation systems. Data can be input into an aggregator like Springshare or other metric collection systems. All of these systems work well when trying to analyze static data. What we mean by static data is data that must first be stored, then accessed in a specific way and analyzed. The downside to static data, aside from its temporal nature, is that there is little you can do in the way of data-driven decision making at the point of input. A library cannot collect real-time data and then deploy it to solve useful problems immediately. The literature on the importance of library assessment is extensive. Much of it is geared toward demonstrating the value of the academic library. As Megan Oakleaf argues in *Value of Academic Libraries: A Comprehensive Review and Report*,[1] libraries should create assessment management systems. These systems seek to demonstrate the importance of the academic library to the larger university. While this is a noble cause and one that is indeed relevant, there needs to be a next step. That step is applying the data collected to make accurate, adaptable, and quick real time decisions, at the point of data generation. In order to take assessment systems to the next level, we have to examine cutting edge computer development.

While an assessment management system is well and good for demonstrating library value, it is a post analysis. Even if the data was gathered yesterday, the decision is already made. If the data shows that the value of the library is drifting from the needs of the user, the damage is already done by the time it can be corrected by the next assessment. What we need is real time analysis completed by a thinking/learning machine. It is only then we can harness the data and quickly deploy the results to aid library staff in adapting seamlessly to the needs of the user. No longer is it justifying needs. The library becomes a reflection of the user by adapting and learning in real time. This is the next evolution in assessment.

In order to accomplish such a monumental challenge, we started small with a library unit that already had experience with data collection. Interlibrary loan requests are tracked comprehensively through a variety of systems. To that end we developed a system called the Online Based Inter-Library Loan Statistical Kit (OBILLSK). This system is a user-activated data harvesting system. It gathers data from a user's ILLiad SQL database, sends that information to a webserver, and presents visualized ILL data for an entire consortium for analysis. We programmed the system with a variety of tools. Visual Studio software was used to write C# source code in the .NET framework for the client software and web application. The website is supported by a Microsoft SQL Server database. The front-end framework utilizes a variety

of tools focused on data visualization concepts, which include Bootstrap, jQuery, ShieldUI, and jVectorMap. The interactive map is populated by JSON-formatted text files, which are periodically generated by a Python script. The Python script was developed using Aptana Studio. We chose these tools because OBILLSK was designed to extract, analyze, and display data from multiple ILLiad databases. We decided the best approach would be to mirror the system requirements of ILLiad provided in Atlas Systems documentation. In order to maximize programming time, we used several third-party JavaScript and CSS libraries rather than designing the web interface from scratch. These front-end frameworks are HTML5 compliant, incorporate native responsive design, and use AJAX for efficient communication with server-side scripts. The reason we set up the system this way was largely based on the amount of data we were seeking to analyze.

The amount of data required to provide meaningful statistics for multiple institutions was substantial. As of this writing, the database table used to hold the ILL records contains approximately 7.5 million records. The first challenge was to build an efficient and secure solution for acquiring the ILL data from member institutions. The second challenge was to calculate and display the statistical analysis on the website barring excessive load times. We developed desktop software for users to download and execute on local workstations to acquire the data. The software prompts users to enter connection credentials for their ILL database. A .csv file is generated and saved on the user's workstation. This process allows the user to view the data prior to sending to OBILLSK. Please note that no patron data is queried by the software or included in the file. The file is then uploaded to the OBILLSK website. The entire process of generating and uploading the data takes one to ten minutes depending on the amount of transactional data included in the file. The development team was provided with a series of metrics used to calculate various turnaround times. This process was automated using a series of SQL stored procedures allowing for the calculations to be performed at any desired frequency. The basic idea was to store the results of the calculations in an ancillary database table and reference the web application instead of performing the calculations on every page load. One of the most significant lessons learned with regards to system efficiency was database field indexing. Once we indexed key fields, such as transaction number and ILL number, the stored procedures and page load times significantly increased. With the ability to analyze the ILL data from up to 35 different institutions we turned our technological development questions inward and began to ask ourselves what we could do with this data aside from justify the importance of consortial ILL. This question led to the development of a learning machine, using predictive analytics and K-means clustering that we have developed to not only predict ILL requests, but also mathematically model the libraries' entire collection in real time. Using Google's Tensorflow open source machine learning algorithms, we were then able to teach a computer to analyze and make decisions based on this behavior. The system we designed we have taken to calling the Automated Library Information Exchange Network, or ALIEN.

The idea for ALIEN came after development for OBILLSK was well underway. As we mentioned in the OBILLSK section of the paper, we were already efficiently capturing ILL request data to analyze the turnaround times for ILL transactions between various universities. We wanted to know if we could use the same data from OBILLSK to predict how many times a university would request a book in future semesters. Though both OBILLSK and ALIEN begin with data from ILLiad databases, the two programs use the data for their own unique purposes. The next section describes how ALIEN uses the ILLiad data to make predictions about how libraries make ILL requests.

ALIEN used the exact same .csv file that is used in OBILLSK. The OBILLSK .csv file was used by a Python script to generate a new .csv file that broke down the number of requests for a book by year, semester, and week. For example, a single row from this new file of book counts contains the book's OCLC number, the calendar year the requests were made in, the total number of requests for that book in the spring, summer, and fall semesters, and the total number of requests for that book on a per week basis. Requests are broken into either a completed request or a cancelled request based on the status changes of the finished request transaction. With OBILLSK, we were only concerned with recent data, but for ALIEN, we needed as much data as possible. Processing almost ten years of OBILLSK data was taking a few hours, so we decided to make the data more efficient. Since ALIEN does not use all of the data that OBILLSK does, we were able to make an ALIEN version of the OBILLSK client that extracted a much smaller subset of data from the ILLiad databases. By slimming down the OBILLSK

.csv file, we reduced the processing time from a few hours to less than 10 minutes without losing any important data.

After the book counts file is created, a second Python script makes the predictions for the next year's requests. The book counts file is grouped by OCLC number and year, so ALIEN creates predictions one book at a time. The structure of a book prediction contains the OCLC number of the book, the year being predicted, the predicted range of requests for that book in the spring, summer, and fall semesters, and how confident the ALIEN system is in its predictions. The data of the first year the book is requested is used to make a conservative base line prediction. Book requests from subsequent years are used to shape the prediction to be more accurate. As ALIEN becomes more confident in its predictions, the predicted range of requests will begin to tighten. Though this technique led to accurate predictions in some cases, there were enough problems in other situations that made us reevaluate how ALIEN looked at the data we gave it. The next section will give some details about what problems we encountered and what changes are being made to overcome these problems.

As mentioned in the previous section, we encountered a few problems that made us look at predicting ILL requests in a different light. This section will explain the main problem that came up and how ALIEN is being adapted to offer more useful predictions.

While there were many smaller problems, most of them fell under the larger problem of lack of information. Information is the most important resource in machine learning and predictive analytics, but oftentimes there are gaps in the data that must be worked around. For a typical machine learning system, it can take dozens or even thousands of generations of data before the system can learn to be truly accurate. With the initial design of ALIEN, a single generation of data for a given book was one year of ILLiad data. Since our ILLiad data only goes back to 2006, a book could have at most 10 generations of data for ALIEN to learn from. For many of our most popular requests, the books would have data for only two to four generations. The system can begin to make predictions off of fewer generations, but having more data creates a more robust system. Additional generations could be added to some books by accounting for different book editions, but we are still limited to 10 generations because of the amount of ILLiad data. Other factors to consider are new professors favoring different books for similar classes, new classes being added, old classes being removed, classes changing between spring, summer, and fall semesters, and classes changing from being offered year round to being offered a single semester. By reviewing the generational limit and other data limiting factors, we decided that focusing on singular books may not be the best approach for ALIEN. This decision led us to data clustering. Data clustering is grouping large amounts of data into a much smaller number of clusters in order to give clearer high level analysis.

Rather than basing predictions off of individual books, we turned to basing predictions off of the requests as a whole. Individual books did not give us as many data generations as we would like, so instead we have begun looking at a book's genre and subject. ALIEN extracts a list of OCLC numbers from its previously made book counts file and queries WorldCat to fill in the genre and subject for each book Texas Tech has requested through ILL. We are currently working to compile a list of OCLC numbers from our circulation and collection data. Once we have data from these three sources (requests, circulation, and collection), we will use data clustering to highlight what genres and subjects are important to our library. After discovering the most important genres and subjects, the library can make more informed decisions about what kinds of books should be added to their collection or continue to be requested through ILL.

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Evaluating Reference Consultations in the Academic Library

Lorie A. Kloda
Concordia University, Canada

Alison J. Moore
Simon Fraser University, Canada

Abstract

In 2015, McGill University Library undertook a project to investigate, propose, and pilot test a method for evaluating the quality and outcomes of reference consultations. The goal of the project was to gather evidence to demonstrate the importance of reference consultations as part of librarians' core contributions to the university. The evaluation tool was developed based on input from librarians, users, and a review of the literature. The evaluation was sent out to 98 users during the pilot test period. There were 53 responses to the evaluation tool for a response rate of 54%. Though preliminary, the results of the pilot test can be helpful in determining the usefulness of evaluating reference consultations, and the outcomes of engaging in assessment of this core library service. The results from this project suggest that implementing a tool to evaluate consultations can be used to inform services and to demonstrate the value of the library for research, teaching, and learning.

Objective

Information services for students and faculty is a key area of responsibility for reference (or liaison) librarians in the university setting, and in-depth reference consultations are an important component. While many academic libraries are diligent about keeping reference statistics, few go beyond these basic measures to evaluate reference interactions, including more lengthy consultations. Establishing and implementing a tool to evaluate consultations could provide the library and librarians with a clearer picture of the effectiveness of consultations and suggestions for improvement.

In early 2015, McGill University Library's assessment librarian observed a lack of scholarship on the outcomes of reference consultations. In tandem with a practicum student in the McGill School of Information Studies, she initiated a project to evaluate reference consultations at McGill. Due to the specific practicum guidelines, the entire project was researched, organized, and tested in a condensed 13-week timeline.

This project was guided by the overarching question, "How can we gather evidence to demonstrate the importance of reference consultations as part of librarians' core contributions to the university?" In addition, the project investigators were interested in a number of things: "Why do library users book reference consultations?" "What occurs during a typical reference consultation?" and "How helpful do library users find reference consultations?"

Defining the reference consultation

In library and information studies literature and within libraries, reference consultations have many different names: "appointments," "meetings," "RSVPs," or "book a librarian" services. For the purpose of this project a reference consultation was defined by two criteria: it must involve in-depth, advanced reference activities, such as literature searches, the introduction of new resources, or teaching software; and, it is scheduled, rather than a serendipitous reference encounter. This definition is supported by the literature; Gale and Evans[1] describe consultations as "in-depth, personalized instructional research sessions," while Magi and Mardeusz[2] claim that consultations are "...a reference service in which the librarian meets with a student in a scheduled session away from the reference desk."

Why evaluate consultations?

The McGill Library is one of the largest research-intensive libraries in North America. Located in Montreal, Quebec, McGill employs 63 librarians across 12 branch libraries, including the University Archives.[3] In the 2014–2015 academic year, McGill

Library had over 2.3 million visitors, 54,175 reference transactions, and 1,323 reference consultations.[4] The majority of these consultations (46%) lasted between 30 and 60 minutes, while an additional 18.46% of consultations were longer than 60 minutes. These figures are considerable, and they do not include time that librarians spend coordinating, preparing for, or following up after the reference consultations.

Reference service guidelines

The Reference and User Services Association division of the American Library Association outlines a set of behavioral guidelines for conducting reference and information services for librarians. Successful reference interactions are characterized by the following performance indicators: the visibility/approachability of staff; the perceived level of interest in the question; how well the librarian listens and makes clarifying inquiries; how successful the search is; and whether or not the user feels appropriate follow-up activities occurred.[5] These behaviors are heavily reliant upon the librarian's reference competencies, which are defined by their access to information, pre-existing knowledge base, ability to market or raise awareness about information or services, willingness and desire to collaborate, and their evaluation and assessment of resources and services.[6] These reference competencies provided the foundational elements upon which the evaluation tool was based.

Development of the evaluation tool

Literature review and environmental scan

Few academic research libraries have created evaluation tools for reference consultations. At the March 2015 Association of College and Research Libraries conference, Devin Savage highlighted the dearth of assessment when it comes to reference consultations, stating that we are "not counting what counts."[7] Consultations are an essential and popular component of library services yet they are not assessed in the same way that other integral services are.

There are a few libraries that have taken on the challenge of evaluating reference consultations, often by implementing a satisfaction-style survey that is offered to patrons upon completion of a reference interaction.[8] Recently, Wayne State University Library ran an interview-based study that found that students who attended reference consultations experienced an increase in confidence in doing research and learned new resources and/or new search techniques.[9] Another evaluation method is using in-depth analysis of citations to measure the impact of reference consultations.[10]

Consultation with librarians

A critical step in the development of the evaluation tool for the pilot project was a series of short, informal fact-finding discussions with five of the university's liaison librarians. Each librarian was from a different branch in order to provide perspective on the various types of reference consultations at the McGill Library.

Clear trends emerged from these discussions. All five librarians spoke about their love for conducting reference consultations, noting that it was one of the times they felt they could make the greatest impact and forge lasting connections. Reference consultations gave them the time they needed to practice "old school librarianship," the sort of work that they "imagined [they] would do as a librarian." Master's and doctoral students were the most common consultation user groups, with most consultations lasting between 20 and 60 minutes (though some were as long as two hours). Librarians reported that consultations were usually arranged ahead of time by e-mail, but sometimes included walk-ins or lengthy phone calls.

In addition to these trends, there were some differences of opinion. A few of the librarians were in favour of evaluating reference consultations because they were interested in the feedback or thought the information could be valuable. Other librarians were hesitant, raising concerns about professionalism, appropriateness of the proposed evaluation method, validity of participant responses, and transparency of results.

Designing the evaluation tool

For the evaluation tool, it was decided to create a brief questionnaire that could be administered to the user as a follow-up to the reference consultation. In order to create the tool, a list of seven questions was drafted and presented to the McGill Library Assessment Advisory Committee for review. The final evaluation tool that was administered for this pilot project is available from: http://bit.ly/McGillConsultFeedback.

Online survey platforms were reviewed in order to determine which would be the most appropriate for the pilot test of the evaluation tool. Google

Forms was selected because the platform is free, easily modifiable, permits downloadable results, and produces the evaluation tool in a format that is compatible with mobile devices. Once Google Forms was selected, the evaluation tool was built, and bit.ly was used to create a shortened custom URL.

A draft version of the evaluation tool was pre-tested using paper printouts of the questions prior to launching the pilot. The pre-test participants gave valuable feedback and some questions were revised.

Once the questions for the evaluation tool were finalized, a general call for participation in the pilot project was sent out to all of McGill's liaison librarians. Ten of McGill's liaison librarians agreed to participate in the project. They were supplied with a message to be sent by e-mail to all users who had a reference consultation in the winter semester. The evaluation was launched on March 10, 2015. Invitations were sent out to a total of 98 possible respondents during the pilot test period.

Results of evaluation

Respondents

Overall, there were 53 responses to the evaluation tool for a response rate of 54%. All but one of the respondents were members of the McGill community, spread across various faculties (Table 1) and most were graduate students at the master's and doctoral levels (Table 2).

Table 1. Faculty affiliation

Affiliation	Number (N=53)	Percent*
Faculty of Arts (including Schools of Social Work, Information Studies) or Faculty of Religious Studies	21	40%
Faculty of Medicine (including Schools of Nursing, Physical & Occupational Therapy, Communication Sciences & Disorders) or Faculty of Dentistry	13	25%
Faculty of Engineering (including Schools of Architecture, Urban Planning)	9	17%
Faculty of Science (including School of Computer Science)	6	11%
Faculty of Education	2	4%
I'm from McGill, but not part of a faculty	1	2%
I'm from another university	1	2%
Desautels Faculty of Management	0	0%
School of Continuing Studies	0	0%
Schulich School of Music	0	0%
Faculty of Law	0	0%
Faculty of Agricultural and Environmental Sciences (including Schools of Dietetics, Human Nutrition)	0	0%

*Percentages have been rounded to the nearest integer and therefore may add up to more than 100%

Respondents are relatively well distributed across the library user groups, but as the liaison librarians indicated, master's and doctoral students do comprise the majority of respondents. It is worth noting, as well, that there were no post-doctoral

students/fellows, medical or dental residents who participated in the pilot.

Table 2. Status

Status	Number (N=52)	Percent
Master's student	21	40%
Doctoral student	12	23%
Undergraduate student	11	21%
Faculty/professor/instructor	4	7%
Research or administrative staff	3	6%
I'm not from McGill	1	2%
Librarian or library staff	0	0%
Post-doctoral student/fellow	0	0%
Medical or dental resident	0	0%

Users were asked when their most recent consultation appointment had taken place. The majority (62%) of respondents reported completing their consultation appointment in the last month, with 34% of them in the last seven days (Table 3).

Table 3. Timing of reference consultation

Reference consultation	Number (N=53)	Percent
Within the last 7 days	18	34%
Between 8 days and 2 weeks ago	4	8%
Between 2 weeks and 1 month ago	11	21%
More than one month ago	19	36%
I don't remember	1	2%

Purpose and content of consultations

Users were asked to indicate what the purpose was for booking their most recent consultation appointment (Table 4). The responses were not mutually exclusive. Responses were rather evenly split between coursework (42%), thesis or dissertation work (40%), and research (funded and non-funded, 44%). These findings are in alignment with the respondents' statuses as students, and of this, mainly master's and doctoral students.

Table 4. Purpose of reference consultation

Purpose	Number (N=53)	Percent
Coursework/assignment	22	42%
Thesis or dissertation	21	40%
Non-sponsored (non-funded) scholarly research	12	23%

Purpose	Number (N=53)	Percent
Sponsored (funded) scholarly research	11	21%
Other activities, including general interest	3	6%
Teaching	2	4%
Patient care	1	2%

Users were also asked to identify the content of the consultation, and could choose as many as apply (Table 5).

Table 5. Content of consultation

Activity	Number (N=53)	Percent
Identifying or locating specific information/resources (e.g., relevant books, articles, datasets, music scores, newspapers, primary sources, and other resources I was previously unaware of)	38	72%
Improving my skills in using one or more resources (e.g., searching journal databases, searching the catalogue)	37	70%
Learning how to access print or electronic materials (e.g., research/subject guides, finding full-text journal articles, streaming music)	24	46%
Improving my ability to use software (e.g., citation software, data visualization software)	12	23%
Other	4	8%

Satisfaction and reference service values

When asked about the overall helpfulness of the reference consultation, all 53 respondents selected "very helpful."

A question about values in the reference consultation asked respondents to what degree each of the values was addressed in the reference consultation (Table 6). This was the question that was most skipped by respondents.

Table 6. Values addressed in the reference consultation

Value	Did not address this	Neutral	Completely addressed this	Not applicable	Total responses (N=53)
The consult facilitated excellence in teaching, learning, or research	1 (2%)	1 (2%)	38 (71%)	2 (4%)	42 (79%)
The librarian/library staff responded to my information needs	0 (0%)	1 (2%)	46 (87%)	0 (0%)	47 (89%)

Value	Did not address this	Neutral	Completely addressed this	Not applicable	Total responses (N=53)
The consult reflected a respect for my confidentiality as a library user (e.g., respected the private nature of subject matter, freedom from being disturbed by other people)	1 (2%)	2 (4%)	35 (66%)	14 (26%)	52 (98%)

A text box for comments invited written input from respondents. The comments were overwhelmingly positive, and reflected a wide variety of respondents. Many respondents wished to thank or highlight the skills, patience, assistance, and support of a particular librarian or library staff member. Other respondents indicated how important the consult service was to the success of their research.

Recommendations and future plans

Conduct survey on a sampling basis

While it could be useful to continue using the evaluation tool to gather more data from more consultation users, in the long term, continuous evaluation is probably unnecessary. The evaluation tool might be more effective when implemented in a regular sampling period. This would maintain current assessment data while balancing requests from users.

Revise or remove problematic questions

The evaluation tool has some problematic questions that require re-evaluation. One of the evaluation's questions asks respondents "how helpful was your consult?" One hundred percent of respondents indicated that their consult was "very helpful." While this is a positive and encouraging response the question could be revised to elicit a wider range of responses. Question 5, which asks respondents whether or not the consultation addressed library values, could be revised as well, considering the number of respondents that did not answer or selected "not applicable" to those three questions.

Mandatory questions

In the pilot project, none of the questions on the evaluation tool were mandatory. However, because many respondents opted not to answer one or more questions, it might be worthwhile to review that approach and make all questions mandatory to see if doing so changes the frequency of responses and also the overall response rate for the evaluation tool.

Distribution method

Based on considerable feedback from the members of the Library Assessment Advisory Committee as well as the librarians during the practicum presentation, the respondents' invitations should come from a centralized university e-mail account, rather than directly from the librarian with whom they had the consult. This would decrease librarians' workloads, and simplify the tracking of consultations and response rate. An added benefit is that this would provide the opportunity to embed the evaluation tool in an e-mail, one of the features of Google Forms. This could increase response rate, as potential respondents would not need to click a link to complete the evaluation tool.

Offer an incentive

In terms of increasing response rate, it has been suggested by many different parties that offering an incentive—even something small—would increase responses. While the response rate was actually considerably higher than expected, it is realistic to anticipate that, moving forward, it will decrease; this tool was completely new in the pilot-testing period and individuals were offered the chance to give feedback for the first time. In the future, offering a small incentive may increase the response rate but it may also be problematic. Offering an incentive means that we will need to collect respondent e-mail addresses and store them separately from the rest of the survey responses; those who felt comfortable

filling in the survey because it was confidential might now take issue with the process.

Use of pilot project results

Whenever a library service is evaluated, it is important to consider sharing the findings with librarians, library staff, library users, and other members of the academic community. For librarians and library staff, the findings could be used in order to inform best practices for reference services. Sharing the results with library users can also be a way of increasing awareness about a valuable library service. Finally, these findings should also be shared with the wider university community, to demonstrate the library's contribution to the university's academic priorities, and highlight the impact that individual reference consultations have on student and faculty success.[11]

Other uses of the evaluation tool

With minimal adaptation, this evaluation tool could be used to evaluate the outcomes of other types of reference transactions, such as virtual reference (both chat and e-mail) as well as in-person reference encounters at a reference desk. Using the same tool to evaluate all varieties of reference services would offer a clearer picture of library users' experiences and facilitate comparison of results.

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Tracking for Outreach: Using Data for Cross-Unit Purposes

Heidi Gauder and Hector Escobar
University of Dayton, USA

This session will discuss how librarians at the University of Dayton have been able to utilize data from reference transactions and programming events in order to improve and deliver library services. Although the data originated from the reference department and programming events, analyses indicated opportunities across the library, particularly for the instruction department and the library liaison program. The data is currently used for library improvement, but it could have potential in exploring the library's role in student success and retention.

Since creating a learning commons a couple of years ago, the University of Dayton's Roesch Library reference department has been coordinating data gathering methods with the writing center. With both units using standard check-in procedures at a shared desk and hosting in-depth consultations in a shared space, it also made sense to share technologies. Since spring 2015, we have logged students for research consultations with the TutorTrac software that is commonly used by writing centers, tutoring and other academic support units. We are not only able to count the number of consultations, but we are also able to record cross-referrals with the writing center, calculate average consultation session lengths, and more.

During the time that we began to collect reference transaction data, another campus unit was developing co-curricular learning opportunities that also offered great data and outreach potential. Residence life staff began offering co-curricular learning opportunities with specific learning goals in mind: authorship, interculturalism, and community living. By participating in these activities, students not only engaged in learning outside the classroom, but they also secured points that increased their standing in the housing lottery, a desirable outcome. The co-curricular learning program is called AVIATE and the events are identified as PATH-eligible (Points Accumulated Toward Housing). Other campus units can participate as long as they are able to articulate how their sponsored events meet the learning goals.

The data is only as useful as the culture in which it is collected, and there are several aspects about the University of Dayton that play into the data collection and library decisions. As a private Catholic university, academics at University of Dayton include a College of Arts and Sciences, plus professional schools for engineering, business, and education and health sciences. There are approximately 8,200 undergraduate students, of which 78% are white, non-Hispanic, and another 12% are international; the remaining population includes Hispanic, African-American, two or more races, and other. The campus is highly residential, with most students living on or near campus. In fact, 90% of the undergraduate population lives in campus housing, as these structures, particularly the ones in the surrounding neighborhoods, are seen as advantageous.

These campus conditions affect the library and its service focus several ways. With a primarily residential campus, most of the library interactions with undergraduates are face to face. The library's marketing committee has developed consistent and ongoing messages about the library as a welcoming gathering place for both individual and group work, and at the same time, efforts have been made to improve the quality of service interactions. Given the predominantly white undergraduate student population, the University of Dayton places high value on diversity, which the library actively supports via its mission statement, a library diversity committee, and campus-wide programming. And finally, the library's curriculum support, specifically the instruction and reference components, is intended for all course levels. The instruction program does do some intentional work throughout the curriculum, with an online tutorial in a required first-year communications course, an online tutorial and face-to-face instruction session, both mandatory, in second-year writing courses, and additional instruction sessions in various upper-level and graduate courses.

The decision to utilize software to record research transactions came about in part because of the campus culture on data collection. Within the library,

there is emphasis on data-based decision making, whether it is analyzing reference department activity to determine service desk staffing needs or programming and outreach decisions. Across campus, many academic support units are already using TutorTrac; the library and writing center are two of the 15 seats currently in use. And finally, students are used to swiping, whether to pay for meals, buy books, or access the gym. The University of Dayton is an urban campus, so residence halls and buildings likewise require swipe access in the evening.

The research consultation data, which currently comprises three semesters, contains information relating to meeting date, department and course number, and instructor. For the fall 2015 and spring 2016 semesters, we found that the largest distribution of students seeking research help were for courses in English, history, teacher education, communication, and mechanical engineering. Altogether, we recorded research consultations for 269 different courses or course sections. By comparing the files with the data we have for instruction, we can ascertain whether research consultations occurred after an instruction session or, more tellingly, where the absence of any instruction sent the student for research help. During the fall 2015 and spring 2016 semesters, we taught 211 course-related instruction sessions. When we compared the instruction data against the research consultation data, we found 60 instances where the course or section had an instruction session and at least one student from that same course or section sought research help. In contrast, there were students from 209 courses who sought research help but did not come in for an instruction session. The instruction team can not only ascertain what research help is needed for a particular class, especially if multiple students are seeking help, but can also use that data as a basis for outreach.

This information will not only help us document our reference transactions more effectively, but it also helps document the growth and utility of the learning commons itself. We are moving from anecdotal evidence that students in particular courses were coming in for research support to documenting exactly which courses students, on their own accord, were seeking help with research support. And, because both the writing center and the reference department each have a seat license in TutorTrac, we are able to document when students use both services or are referred from one unit to the other. In the fall 2015 and spring 2016 semesters, we recorded 152 students who sought both writing and research help, which we see as a growing sign of collaboration between the library and the writing center, as well as growing student understanding that the learning commons can serve as a one-stop center for research paper support. Given that the learning commons opened in August 2014, we were particularly anxious in making sure that our students understood what services were offered and how they could get help, as the writing and research consultation space is an open area that reverts back to student use after the consultation hours are done for the day.

The data will also provide help with our library liaison program, which is moving away from a collections-based model to one where librarians are expected to at least know, if not perform, multiple liaison responsibilities with assigned departments. This data, then, can help liaisons, some of whom do not provide reference services, with a sense of research needs in their constituents. In addition to basic information, this data could also help liaisons gain even more insight about particular collection development needs. For liaisons who do have reference responsibilities, this kind of data provides a more concrete work measure of the extensive research and reference work that is often done on behalf of our users. Within the reference department, we are able to use this information to evaluate our reference staffing models as we look to determine the best way to help students while balancing librarian workloads.

The data collected up to now has been strictly for programmatic improvement as we look to identify opportunities for library services and collaborations. As such, we have only looked at our interactions at the course and departmental level. As the library considers its role in student success and retention, the library would likely need to analyze the results at a more granular level. However, further conversation is needed with our Office of Institutional Research and Reporting before we use the data for such purposes.

In addition to the reference transaction data, the library has also been able to collect data on its programming efforts and look at that data to improve and extend services. As previously noted, this data is gathered from events that students attend in order to secure points for the campus housing lottery. In

the 2015–16 academic year, the library sponsored 14 PATH-eligible events: nine film screenings, two panel discussions, and one each of a book talk, presentation, and teach-in. Student participation is recorded with OrgSync, a campus engagement software product. Data from the library-sponsored events that first year indicated large participation numbers in September and October, as well as March, right before the housing lottery. Excited by this type of student engagement outside the classroom, staff across the library have scheduled 17 PATH-eligible events for the fall 2016 semester. The September and October 2016 events saw over 200 attendees, of which just over half (51%) were upper-division students, another 27% were second-year students, and 22% were first-year students.

The PATH-eligible events offer even more opportunities and consideration in the future. Within the library, the instruction team is taking another look at instruction workshops that focus on lifelong learning, rather than being tied to a particular course. The instruction team sees opportunities to collaborate with external units, like the campus credit union for a workshop on financial literacy, career services for company research workshops, and the writing center for sessions on brainstorming and topic development. The breakdown by student standing could help us target specific opportunities to particular student groups or class year.

As these co-curricular learning activities grow, however, there will be an increased need for internal coordination, as the library resources—namely, space and personnel—remain static. Dates and times for programming are also limited, as the co-curricular programming is usually scheduled at times designed to be optimal with student life, which is after most classes are done for the day. Within the library, different groups sponsor the co-curricular learning opportunities; for example, the library diversity committee hosts a monthly film series, the marketing and outreach committee sponsors a Hispanic heritage month film series, and another reference librarian organizes an undergraduate book club. Because no single library group or unit manages the PATH-eligible events, library stakeholders will need to work together to avoid conflicts and scheduling issues.

Although not without controversy, using standardized swipe data helps create a uniform set of data files that can be analyzed by the units housed in the information commons. By using data collected from one service point to help analyze the work of a related library service—while recognizing relevant campus circumstances and values—we will be able to determine relevant campus constituents for a targeted, proactive outreach plan.

A Factor Analysis Approach to Persona Development using Survey Data

Hae Min Kim and John Wiggins
Drexel University, USA

Abstract

Managers may be skeptical of incorporating personas in making decisions about service designs or marketing the value of services because such depictions of customers may be based on limited, subjective, or unsupported impressions of customer behaviors. This study explores factor and cross-tab analyses of survey data for suggesting shared characteristics of engagement with library services and user attributes for developing personas. Creation of personas was pursued for use in a business case to engage stakeholders with shaping the libraries' strategic directions and services. Quantitative data describing reported expectations and perceptions of service offerings were acquired via a user survey, and factor analysis was applied to extract common groups of responses. Subsequent cross-tab analysis of the loaded factors with demographic and library location data suggested characteristics that can be used to develop personas. Staff confirm the suggested groupings appeared intuitive based on their experiences with users. This study's results encourage more exploration of factor analysis of quantitative data as an initial step in developing personas for different library management decisions.

Introduction

An easily communicated understanding of user interactions helps libraries improve services. Personas represent groups of actual users, but are not real people, and help characterize common customer interactions with products and services. Personas are used in design to clarify and predict generalized user behaviors. In libraries, personas are useful for managers and designers to plan services and design spaces, and to communicate with stakeholders.[1] While both qualitative and quantitative methods can be used to collect data for developing personas, many cases have been based on individual and focus group interviews from such patron types as undergraduates, graduates, and faculty from various disciplines. Limiting analysis to qualitative methodologies may result in misinterpreted, stereotyped, or unbelievable personas.[2] In order to avoid these drawbacks, we designed a quantitative method that utilized factor analysis to identify distinguishing characteristics to use in persona development. Factor analysis has been used in studies to develop personas for employees in a company[3] and restaurant customers.[4] These studies collected data through user surveys and conducted factor analysis which helped identify groups of users.

The purpose of this study is to examine the use of factor analysis based on user ratings of expectations and perceptions of service offerings to identify common characteristics correlated in the survey response data. This is an exploratory case study, guided by the following research questions: (1) to what extent does factor analysis of customer ratings of expectations and perception of services load common characteristics of library users, and (2) to what extent does crosstab analysis of the clustered loads from factor analysis and customer demographic data help create personas?

This study utilized survey responses to questions about most frequently identified library services at one academic library. Factor analysis applied to these responses revealed clusters of significant groups of services within the larger set of observed variables. Within a factor, each variable was triggered by a question that prompted user ratings of a service and thus describes a characteristic—an expectation or perception of a service that has correlation within the factor. Each factor therefore offers a set of correlated characteristics to consider in development of a persona. The factors will be discussed with respect to implications for library service improvement and decision making.

The study setting is the Drexel University Libraries, a mid-sized university with about 26,000 students. The study results will be valuable to library service assessment managers and administrators interested in development of personas with unbiased perspectives and in gaining insights into users' perceptions of library services, to guide strategic planning for service promotion and user outreach.

Literature Review

Persona development began in the 1990s with use of data collected through qualitative methods. However, it has evolved to include quantitative methods because data gathering and analyses about customers could be fast and cheap, and be objective considering different features in a research scope.[5] Previous studies have reported that factor analysis performs well for identifying new components which are unobservable via qualitative methods.[6] In this section, we reviewed what kinds of methods have been used for developing library personas, and quantitative methods applied in marketing and HCI (human computing interface) studies.

A software designer and programmer, Cooper,[7] initiated personas development to understand target users' needs, behaviors, and attitudes for a product design using ethnographic interviews to obtain data about users. As designers and developers need to understand users with more comprehensive data, the persona development method has evolved. For example, Pruitt and Grudin[8] utilized quantitative as well as qualitative data collecting methods, which enriched descriptions and validated personas for software interface design.

In library settings, many practitioners and researchers have created personas based on qualitative data gathered from interviews with users and librarians that they used in library website design as well as implementation and development of other services. Koltay and Tancheva[9] interviewed academic library website users and identified users' expectations in order to develop a user-focused search interface. In addition to interviews with users, Phillips[10] added a diary study which directed participants to document their activities about their information seeking behavior on an archives website. Toward developing personas, interviews with target users have been conducted to identify perceptions of libraries' services including data curation[11] and to study the information needs of humanities scholars.[12] Library user personas were developed via a group workshop with library staff members, and the gathered assumptions were validated by user data from responses to an assessment survey and factbook statistics data.[13] Zohoorian-Fooladi and Abrizah[14] applied personas to understand how academic libraries have used social media, collecting data via interviews and focus group discussions with librarians. Qualitative data collecting methods and identifying user needs and expectations about services have uncovered previously unknown issues, which quantitative methods have not validated.

In recent years, a few authors have begun to apply mixed methods including both qualitative and quantitative techniques for creating library personas. Tempelman-Kluit and Pearce[15] developed personas about their library users by extracting variations of users' motivation and information needs through content analysis of chat reference transcripts, and conducted a cluster analysis using those two factors. Four clusters were identified, and qualitative information from library activities was incorporated to finalize personas. Their analysis helped evolve persona characters without including typical academic status such as undergraduate, graduate, and faculty. Zaugg and Rackham[16] identified ten personas for undergraduate students in an academic library based on data gathered from previous assessment projects, observations, focus groups, and interviews with student teams. Then, they conducted a survey that asked students to choose one (out of ten) persona with which they resonate. Using the survey data, factor analysis was performed on the student choices of relevant persona; factor loads found four components among ten personas, which indicated personas that shared a common theme based on a similar component. They used factor analysis for the validation of developed personas via qualitative methods, which is different from our study approaching data collection via survey and conducting factor analysis to identify common characteristics for the design of the persona.

In HCI studies, statistical analysis has been used to identify common types of information needs, which broadened the understanding of target users without relying on demographic classification.[17] Researchers developed surveys to collect data that include a number of dimensions of different context in each study. For example, Sinha[18] and McGinn and Kotamraju[19] used factor analysis to discover underlying groups in their survey data of restaurant customers and one company's workers, and they developed personas with additional information including behavioral data about their user groups. Tu, et al.[20] applied cluster analysis to their survey data of online travel service business finding two clusters, and conducted a user observation and interviews to develop personas for the online travel service business. Brickey, et al.[21] compared factor and cluster analysis for persona development, and recommended factor analysis, because it finds latent components in original variables, rather than cluster

analysis, which identifies groups of cases which could have no underlying structure.

Overall, qualitative methods for creating personas in libraries have been used for design of websites and reference services. However, there are few published articles about development of library personas using factor analysis as an initial approach. Statistical analysis of survey data is a quantitative method to find important groups that are unobservable by interviews. The successful studies using factor analysis in other fields reviewed here support the method as applicable to library studies.

Methods

A quantitative survey approach was employed in order to quickly gather data from a large population and to apply factor analysis for detecting highly related services in the libraries. The design of the questionnaire was based on service quality assessment, asking for ratings of expectation and perception of specific library services, to yield responses reflecting user reaction related to library services. The questionnaire contained thirty statements about fifteen core Drexel University Libraries services including printing, computing, events organized by the library, assistance from liaisons, staff assistance to locate books and other resources, circulation services and policies, online databases and library catalog, and spaces used for study, collaboration, and events. Each survey respondent was also prompted to report college or school affiliation, academic status, and most frequently visited library location.

To recruit participants, the survey was distributed online—via the libraries' website, through targeted e-mails to faculty, departments and student organizations, and on Facebook—and on-site at one of the libraries' physical sites and in some classes where faculty agreed in advance to participate. The surveyor tried to gather responses meeting sample size based on colleges (Table 1).[22] The authors calculated sample size with 95% confidence level and ±10% allowable errors based on the proportion of each college.[23] The proportion of sample size in each college ranges from 1.2% to 1.5% of the total student population.

Survey distribution took place in late February through early March 2016, and the target sample size was about 340. The collected data were analyzed with statistical methods to identify commonly shared characteristics. Factor analysis was performed to identify the underlying components of library services (characteristics of user engagement with services), and crosstab analysis was used to investigate the distribution of demographic values such as college affiliation, academic status, and library location visited in order to match them with the extracted components from factor analysis (user attributes). Data management and all analyses were performed using SPSS 23.0.

Results

Responses

The number of received valid responses to the questionnaire was 435. Distribution of respondents is summarized by college affiliation (Table 1) and patron status (Table 3). The total university student enrollment in 2015 was 26,359, distributed across seventeen colleges at Drexel. Although the overall response rate of 1.7% satisfied the overall sample size goal (1.3%), some colleges did not reach the proper ratio. Nonetheless, we used the full data set to explore the potential usefulness of the factor analysis approach.

Table 1. Number of responses by college affiliation

College	Enrollment (proportion)	Minimum sample size suggested	Responses	Percent of total responses
Arts and Sciences	3005 (11.4%)	38.80	48	11.1%
Biomedical Engineering Sci & Health Systems	863 (3.3%)	12.17	29	6.7%
Biomedical Sciences & Professional Studies	939 (3.6%)	13.20	21	4.8%
Business	3898 (14.8%)	48.41	39	9.0%

College	Enrollment (proportion)	Minimum sample size suggested	Responses	Percent of total responses
Computing and Informatics	1818 (6.9%)	24.67	13	3.0%
Economics	253 (1.0%)	3.65	2	0.5%
Education	1112 (4.2%)	15.52	20	4.6%
Engineering	4649 (17.6%)	55.81	24	5.5%
Entrepreneurship	13 (0.05%)	0.19	2	0.5%
Hospitality and Sport Management	409 (1.6%)	5.87	28	6.4%
Law	441 (1.7%)	6.32	5	1.1%
Media and Arts Design	2083 (7.9%)	27.96	55	12.6%
Medicine	1083 (4.1%)	15.14	73	16.8%
Nursing and Health Professions	4931 (18.7%)	58.42	48	11.0%
Honors	28 (0.11%)	0.41	0	0.0%
Professional Studies	399 (1.5%)	5.73	14	3.2%
Public Health	435 (1.7%)	6.24	13	3.0%
Missing	-	-	1	0.2%
Total	**26359 (100%)**	**338.49**	**435**	**100%**

Factor analysis

First, a factor analysis was conducted. It reduces the number of variables, examines correlations among observed variables, and identifies groups of interrelated variables (each group is a factor). KMO and Bartlett's statistics showed this study data set is suitable for factor analysis, with KMO at 0.83 and Bartlett's indicated significance (x^2 (df=435) = 6858.91, $p < 0.001$).

The initial factor analysis output suggested nine factors, which are not much reduced from the original fifteen services for which we gathered the data. The best fit is based on the ratio of factors to total services along with total variance explained, and the grouping of variables within a factor having a probable explanation to support the persona. In order to find a reasonably small number of interpretable factors explaining the maximum amount of variance in the data, we ran multiple extractions, selecting between four and seven factors, and determined that five factors yielded the most interpretable results (Table 3). These factors suggested grouping services as follows: computer related facilities in the libraries, services providing assistance to patrons, circulation services, online databases and interlibrary loan, and library space use. The grouped services are more related to each other than to other services in different groups.

Table 2. Factor analysis

Item	Component loadings					Eigen Values	% of Variance
	1	2	3	4	5		
Importance of the printing service	.815	-	-	-	-	3.989	13.295
Importance of the scanners	.748	-	-	-	-		
Importance of the computers	.742	-	-	-	-		
Importance of the library space	.636	-	-	-	.426		
Satisfaction with the printing service	.510	-	.471	-	-		
Satisfaction with the scanners	.432	-	.421	-	-		
Importance of library events	-	.719	-	-	-	3.777	12.590
Importance of the services provided by library liaisons	-	.698	-	-	-		
Satisfaction with library events	-	.655	-	-	-		
Satisfaction with the services provided by library liaisons	-	.592	.455	-	-		
Importance of the help from library staff in locating books or resources	-	.585	-	-	-		
Satisfaction with borrowing books from the library for leisure reading	-	.557	-	-	-		
Importance of borrowing books from the library for leisure reading	-	.525	-	-	-		

Item	Component loadings					Eigen Values	% of Variance
	1	2	3	4	5		
Satisfaction with the service provided at the circulation desk	-	-	.654	-	-	3.023	10.078
Satisfaction with access to textbooks on Reserve	-	-	.626	.360	-		
Satisfaction with the services provided by the library staffs	-	.444	.603	-	-		
Satisfaction with the desktops and laptops provided by the library	.462	-	.498	-	-		
Frequency of visits to the circulation desk	.388	-	.439	-	-		
Importance of online databases on the library website (including e-journals, e-books, articles...)	-	-	-	.704	-	2.797	9.323
Importance of interlibrary loans	-	-	-	.665	-		
Importance of the library catalog	-	.380	-	.614	-		
Satisfaction with the interlibrary loans	-	-	-	.537	-		
Satisfaction with the library catalog	-	-	-	.525	-		
Satisfaction with the online databases on the library website	-	-	-	.520	-		
Importance of access to textbooks on reserve	.393	-	-	.456	-		
Satisfaction with the library space to organize or host an event	-	-	-	-	.775	2.733	9.109
Frequency of using library space to organize or host an event	-	-	-	-	.708		
Satisfaction with the group meeting spaces	-	-	-	-	.671		
Importance of group meeting spaces	.481	-	-	-	.622		
Satisfaction with the study spaces that the library offers	-	-	.401	-	.530		

Item	Component loadings					Eigen Values	% of Variance
	1	2	3	4	5		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations.							

When running factor analysis, factor scores were saved as variables for further analyses. Based on the factor scores from the factor analysis extracting five groups, each of the 435 cases was categorized into one of the five groups.

Crosstab analysis

Crosstab analysis was conducted to test how the five factors might be matched to college affiliation, academic status (Table 3), and frequently visited library location (Table 4) data collected by the survey to suggest attributes that best describe the users whose responses contributed to the characteristics assigned to the factors. The results of crosstab analysis show the percentage of distribution of each attribute within each factor. In the case of academic status, most freshman students (37.1%) are assigned to factor one as a possible user attribute to suggest for further persona development (Table 3). Among locations, the medical education library is matched to factor three (Table 4). Among the 17 colleges, we selected 10 representative sample colleges (Table 1) which met or surpassed the sample size in each population.

Table 3. Crosstab analysis by status

Factor Score Fresh-man		Status							Total
		Soph-omore	*Pre-Junior	Junior	Senior	Graduate /Master	Doctorate		
1	Count	14	6	9	7	22	19	13	90
	% within Status	40.0%	12.2%	29.0%	11.7%	20.2%	18.8%	26.0%	20.7%
2	Count	10	12	5	16	25	24	3	95
	% within Status	28.6%	24.5%	16.1%	26.7%	22.9%	23.8%	6.0%	21.8%
3	Count	5	6	9	12	16	16	16	80
	% within Status	14.3%	12.2%	29.0%	20.0%	14.7%	15.8%	32.0%	18.4%
4	Count	2	5	1	9	25	31	13	86
	% within Status	5.7%	10.2%	3.2%	15.0%	22.9%	30.7%	26.0%	19.8%
5	Count	4	20	7	16	21	11	5	84
	% within Status	11.4%	40.8%	22.6%	26.7%	19.3%	10.9%	10.0%	19.3%
Total Count		35	49	31	60	109	101	50	435
% of Total		8.0%	11.3%	7.1%	13.8%	25.1%	23.2%	11.5%	100.0%

Note: "Pre-Junior" designates a student in the third year of a five-year undergraduate program.

Table 4. Crosstab analysis by library location

Factor Main campus library		Location						Total
		24/7 section of main campus library	Medical education library	Group learning commons	Health sciences library	Don't use space		
1	Count	57	5	14	0	3	11	90
	% within Location	22.5%	38.5%	24.6%	0.0%	11.1%	13.6%	20.7%
2	Count	48	5	6	1	5	30	95
	% within Location	19.0%	38.5%	10.5%	25.0%	18.5%	37.0%	21.8%
3	Count	40	1	11	0	4	30	84
	% within Location	15.8%	7.7%	19.3%	0.0%	14.8%	37.0%	19.8%
4	Count	40	1	11	0	4	30	86
	% within Location	15.8%	7.7%	19.3%	0.0%	14.8%	37.0%	19.8%
5	Count	68	1	4	2	6	3	84
	% within Location	26.9%	7.7%	7.0%	50.0%	22.2%	3.7%	19.3%
Total Count		253	13	57	4	27	81	435
% of Total		58.2%	3.0%	13.1%	0.9%	6.2%	18.6%	100.0%

Discussion

The five groups of variables identified from factor analysis and the crosstab analysis of these five factors with user demographics and reported most frequently visited library locations suggested user attributes for development of five personas (Table 5).

Table 5. Groupings assigned by factor analysis and cross-tab assignments.

Factor	Assigned by	
	Factor analysis	**Cross-tab analysis**
1	• Printing, scanning and computer use	• Freshman, Pre-Junior • Medicine, Entrepreneurship, Arts and Sciences • Medical educational library, main campus library
2	• Liaison's help via web	• Senior • Arts and Sciences, Education • Online, 24/7 section of main campus library

Factor	Assigned by	
	Factor analysis	Cross-tab analysis
3	• Borrow reserve books in circulation desk	• Pre-Junior, Doctorate • Law, Medicine • Health education library, health sciences library
4	• Online DB and ILL	• Master's • Biomedical science, Education, Public health • Online
5	• Space use for group meeting and study	• Sophomore, Junior • Media arts and design, Hospitality and Sport Management • Main campus library, Group learning commons

The first factor grouping suggests characteristics related to engagement with printing, scanning, and/or computer services, and cross-tab analysis identifies user attributes of first-year students, students in the College of Arts and Sciences, and visitors of the main campus library. The second factor suggests engagement with liaison services via the web, and user attributes of senior-year students and the College of Education. The third factor suggests engagement with reserves and circulation services and staff assistance. User attributes correlating with the third factor suggest doctoral-level students, the College of Medicine, and use of the medical education library. The fourth factor suggests characteristics including use of electronic resources and interlibrary loan services, and user attributes include master's-level students and the School of Public Health. The fifth factor suggests engagement with use of library spaces for study and group meetings with related user attributes of sophomore-level students and enrollment in the College of Media, Arts, and Design. The study authors consulted with library staff to ask to comment on how intuitive each set was to characterize a persona, and confirmed that these groupings made good intuitive sense.

The factors were passed to the team building the library's business case as suggestions for developing personas. The business case team, which determined which services to highlight among library initiatives being presented, can review the factors for suitability for further development of personas in support of the business case. For example, if a persona describing space use is helpful to highlight in a section of the business case, the characteristics and user demographics suggested by the quantitative analysis may provide helpful elements in developing the persona. The team will need to add other elements found in personas as needed, such as including a name and developing a story that provides context for the persona's interactions with elements of the business case.

However, factor analysis has some limitations. It requires statistical background. KMO and Bartlett's test might in some cases reveal a lack of relationships among some survey data, and so factor analysis would not therefore apply. To apply factor analysis, variables must be measured at least at the interval level; thereby data gathering instruments must appropriately scale response options for questions. The larger the number of variables, the larger the sample size required for accurate factor analysis; for example, for 15 variables, 150 responses, or at least ten samples per variable, are required.[24] After factor analysis, further statistical methods such as cluster analysis, crosstabs, and ANOVA are recommended and may require a larger response sample.

Conclusions

Drexel and its libraries are committed to using data and evidence for decision making. The quantitative data about library users identified in this study illustrate a data-based approach to development of personas as a tool to help tell the story of the libraries' contributions to the university mission.

The study results suggest that there are several factors to consider in developing personas of Drexel University Libraries users.

Quantitative analysis minimizes researcher bias in the interpretation of results. Staff confirmation of intuitiveness of characteristics grouped as factors suggest that including factor analysis can guide the development of personas. Ultimately, this quantitative approach offers promise to help validate previously developed personas in libraries. Avoiding interpretation and unintended filtering errors that might occur in the collection of qualitative data is the objective, starting with quantitative data to suggest personas. For example, some staff assume that students have access to computers and carry their own laptops, but quantitative data suggest that a cohesive segment of the libraries' users (13% of survey respondents) identify engagement with the libraries' provision of computing, printing, and scanning technology for print and electronic resources. Any conclusions about the validity of groupings of characteristics of service engagement and user attributes should be made with caution, and the factors and associated attributes are offered only as an illustration of the process and not as characters representing the Drexel University Libraries user population.

This exploratory case study addressed responses regarding library services, so the results of the factor analysis could only suggest characteristics and attributes for development of personas to use when planning or improving library services as a subset of the libraries' activities. Factor analysis of different data sets could address different population segments or different library activities. Since the study design is based on a single case study, generalizing findings about library users to possibly create universal personas among academic libraries will require more extensive data gathering of engagement with services and controls for variations across library settings. To define factors and confirm that the suggested factors and attributes might appropriately address library needs, the authors invite others to review the results compared to their perceptions of services and users.

It is recommended that more case studies using factor analysis with survey data be explored in other institutions. Interpretation with more data including circulation, library entrance, and e-resource usage could better identify the characteristics and attributes suggested for development of personas by factor analysis. Also, further studies are needed to apply the data of expectation and importance ratings by survey respondents to develop personas, and validate and implement the results for library marketing, advocacy, and quality improvement management.

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Assessing to Transform an Aging Learning Commons: Leveraging Multiple Methods to Create a Holistic Picture of Student Needs

Sarah Hutton and Jessica Adamick
University of Massachusetts Amherst, USA

Abstract

The transformation of academic library spaces is necessary to keep up with a constantly changing intellectual landscape. Over 10 years old, the UMass Amherst Learning Commons has experienced growth and minor reconfigurations over time, but dramatic transformation is needed to meet the needs of future students. This paper describes an approach to assessing a learning space for the purpose of transforming it, a two-year process undertaken by a multi-department team. The team employed quantitative and qualitative methods to investigate student work patterns and preferences and the library spaces and organizational structures that support them.

Introduction

Over the past 15 years, academic libraries have been constructing new or renovating old spaces into a commons—an "information commons" or "learning commons" model. These spaces, converging access to library collections, student support services, and technology, are constructed with the intent to transform the traditional library setting into thriving learning communities. The learning commons as a place has evolved from a combined library and computer lab area into a full-service learning, support, research, and project space for the undergraduate student population.

The EDUCAUSE report *Learning Commons to Learning Outcomes* outlined a boom in the learning commons model, with over 150 instances in 2010 cropping up in academic libraries worldwide.[1] The increasing instances of this model speak clearly to its popularity; however, the question remains: is the learning commons successfully supporting undergraduate student learning? While Lippincott states that these "renovated facilities have become enormously successful, if gate count statistics are used as a measure," there remains her following concern of "how do we engage [the students]?" and the rationale that when "properly designed, implemented, and operated, [the learning commons] will enhance student learning and scholarship."[2]

Over 10 years old, the University of Massachusetts Amherst Libraries' Learning Commons (LC) is in need of a major update, as it was developed to meet the needs of students over a decade ago. While still very popular today, many of the technologies and services of the LC praised as innovative at the time of implementation have been surpassed by new developments in academic technology and library service models. As has always been the case, the library needs to provide the appropriate environment for students to complete their academic work, and the nature of that work is constantly changing. For example, with the increasing number of team-based learning classrooms at UMass Amherst in recent years, the LC needed to be developed to reflect these burgeoning pedagogical offerings on our campus; team-based tables and seating configurations have been installed to allow for teams to complete project work outside of the classroom, and many of the group spaces we have had for open use are now bookable for reservation, due to the high demand for project working areas. Additionally, because academic library collections are now nearly completely digital, we have been consistently adding new technologies to facilitate access to these collections. Our services need to reflect these changes as well; a staff well versed in print collections and more traditional lecture-based education has needed to constantly shift, grow, and change to meet the demands of our student population. We have gotten to a point where the reactive changes we have made over time to maintain an adaptive space are not enough—the cracks are starting to show. More proactive drastic change needs to occur in order to meet the needs of our future students.

To make a recommendation on the transformation of the LC, the libraries formed a multi-department task force to research student use of the library and

learning needs, and develop a proposal for the future LC based on that research. This paper describes the numerous methods used to assess the LC in order to develop recommendations for adapting an existing learning space. The team employed quantitative and qualitative methods to investigate student work patterns and preferences and the library spaces and organizational structures that support them.

Methods

New assessment methods were developed specifically for this project, but we also leveraged the results of ongoing assessment methods. Selected LC transformation-specific methods include microclimates and focus groups, and ongoing assessment methods include ethnographic research, headcount collection, service point data collection, Association of Research Libraries (ARL) LibQUAL surveys, and evaluative reports.

Microclimates

The most significant new assessment method was the creation of a testbed space of various microclimates, which was used to evaluate the most successful types of spaces and combinations of furniture and technology. Three distinct microclimates were formed: collaborative working groups, team-based learning style group work, and alternative comfortable seating options. The creation of a small-scale experimental space allowed us to take risks within a smaller budget, and without impacting the rest of the LC. Assessment of these pilot spaces would inform the committee as to ideas for a future learning commons. The microclimate concept arose out of visits to the Taylor Family Digital Library at the University of Calgary as well as to the Hunt Library at North Carolina State University.

Focus groups

Ten focus groups were facilitated by the UMass Amherst Mark H. McCormack Center for Sport Research and Education in 2014. Groups were comprised of faculty, graduate students, and undergraduates. Participants were recruited using a variety of methods: a questionnaire at a support desk, an e-mail from the director of libraries to faculty and graduate students, and random intercepts/ approaching students visiting the library the day of the focus groups.

Ethnographic research

From fall 2012 to the present, both undergraduate and graduate level anthropology courses have used the libraries as a client, where students perform ethnographic research in the library guided by themes such as identity, navigation, organizational change, and racial inclusiveness.

Headcount data collection

The libraries have collected headcount data, or data about the use of our spaces, since fall 2012. Headcount data are collected each hour for a week, for six weeks each year.

Service point data collection

The libraries have collected service point transaction data since 2009. Every transaction is recorded in LibAnalytics; time, date, service point, and staff member information is automatically recorded, and the staff member ranks the transaction on a scale of one to three according to effort, time, and knowledge or skill required.

ARL LibQUAL surveys

Responses from LibQUAL results from 2015 were analyzed for information related to the LC. More information about LibQUAL, including details about methodology, can be viewed in the University of Massachusetts Amherst's results notebook.[3]

*Evaluative reports*Over the past several years, the libraries formed task forces that have reviewed and made recommendations about the future direction of our departments. A Research and Liaison Services Task Force, Access Services Workflow Review Task Force, Digital Strategies Group Strategic Plan Implementation Task Force, and Marketing Work Group worked on environmental scans, literature reviews, and workflow reviews.

Findings

By combining ongoing methods with new methods for the purpose of the LC transformation, we were able to create a robust picture of student behavior and needs in an academic library. Selected major findings are presented below.

Microclimates

In general, the microclimates produced an extremely positive response from students, and students wanted more like spaces throughout the library. Furniture that supports the ability of students to work together, yet be somewhat sequestered, is extremely popular, validating the concept of "alone

together." Furniture is constantly rearranged by students and so should be movable, but there should also be some permanently installed furniture to anchor each space. Furniture should be stain resistant, sturdy, and cleanable. Ongoing technical support is needed to help utilize the provided technology; this comes not only in the form of staff support, but instructions and signage to encourage self-starters.

Focus groups

Findings from undergraduate focus groups reveal that first years and sophomores constitute the heaviest users of the LC, who use it mostly for group work. Juniors and seniors also use the library for group work, but have less patience for noise in the LC. Undergraduates prefer Mac computers and use the libraries' printers frequently. Undergraduates also had varying levels of awareness of services in the LC, and expressed discomfort at asking for help and a preference for figuring out things on their own.

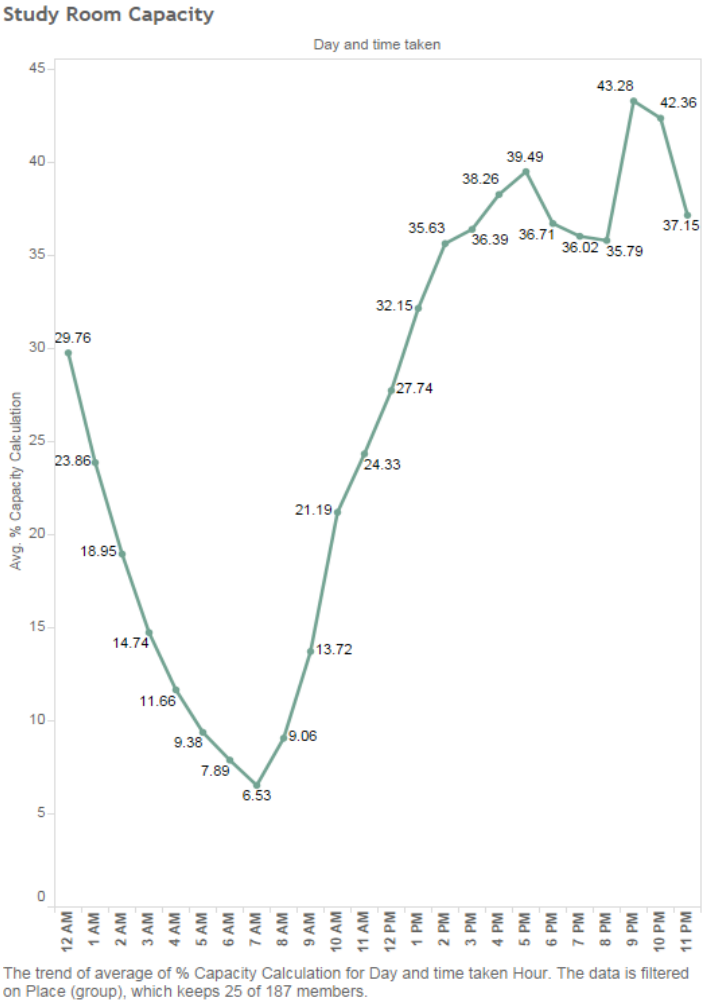
Ethnographic research

There were four major themes shared between both undergraduate and graduate student research. First, as we had gathered from analyzing data from previous surveys, students were confused by what services are offered in the LC. Either signage lacked clarity, or students otherwise had difficulty navigating the large space and number of resources offered. Second, students reported that while they wanted to be in the middle of a busy and socially charged area of the library, they still craved privacy and their own personal space—if there was a way to be "alone together." Third, the group study rooms in the LC were available on a "first come, first served" basis, where students were able to self-govern usage by having groups displace single and two-person usage as needed. However, students reported discomfort at approaching and displacing other students. Lastly, in recent semesters, an emergent theme of inclusiveness and safety has emerged; there are some areas in the library that are viewed as "white spaces" by students, and other spaces that are much more comfortable for students of color, offering opportunity for self-expression without fear.

Headcount data collection

Headcount data reveals trends about use of spaces, technology, and furniture. For example, on average, group study rooms are not used at capacity, and instead they are used at half capacity or less (Figure 1).

Figure 1: Study Room Capacity



By grouping areas of the LC together by type (copy/print/scan, study rooms, study tables, window seating, computers), we can see that the most heavily used type of space in the LC is revealed to be, on average, study tables (Figure 2).

Figure 2: Average Use of LC Places by Hour

Average Use of LC Places by Hour

LC Place

0 20

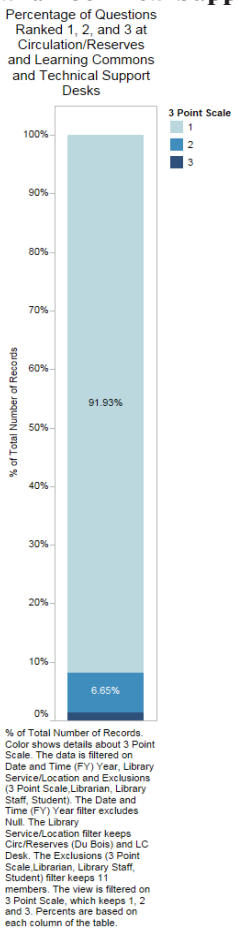
Hour of Day and time taken	Copy/Print/Scan	Study Rooms	Study Tables	Window Seating	Computers	Grand Total
12 AM	0	2	7	1	3	2
1 AM	0	1	5	1	2	2
2 AM	0	1	3	0	1	1
3 AM	0	1	2	0	1	1
4 AM	0	1	2	0	1	1
5 AM	0	0	2	0	1	1
6 AM	0	0	1	0	1	0
7 AM	0	0	2	0	1	1
8 AM	0	0	4	1	1	1
9 AM	0	1	8	1	3	2
10 AM	0	1	13	3	4	3
11 AM	0	1	14	4	6	4
12 PM	1	1	17	5	7	5
1 PM	0	2	17	5	8	6
2 PM	1	2	18	6	8	5
3 PM	1	2	19	6	20	12
4 PM	0	2	18	5	8	6
5 PM	0	2	17	5	9	6
6 PM	0	2	15	4	7	5
7 PM	0	2	14	3	6	5
8 PM	0	2	14	3	6	4
9 PM	0	2	17	4	7	5
10 PM	0	2	14	3	8	6
11 PM	0	2	10	2	5	4
Grand Total	0	1	11	3	6	4

Average of People Count broken down by LC Place vs. Day and time taken Hour. Color shows average of People Count. The marks are labeled by average of People Count. The view is filtered on LC Place, which keeps Copy/Print/Scan, Study Rooms, Study Tables, Window Seating and Computers.

Service desk data collection

Because the three service points in the LC have been collecting data for several years, these data can be reviewed to inform staffing questions such as type of staff and staffing levels according to time of day or week. After combining data from the circulation/reserves desk and the learning commons and technical support desk, it is known that nearly 92% of questions asked were ranked as one, or quick and easy questions that can be handled with introductory training (Figure 3).

Figure 3: Percentage of Questions Ranked 1, 2, and 3 at Circulation/Reserves and Learning Commons and Technical Support Desks



ARL LibQUAL surveys

Undergraduates prioritized the environment and feeling of the library as a comfortable, quiet getaway space that would allow them to do work as individuals (group work space was also desired, but ranked lower). Students were satisfied with levels of service in the following categories: willingness to help others, giving users individual attention, readiness to respond to users' questions, employees who instill confidence in users, and employees who deal with users in a caring fashion. Areas to address in the LC transformation include a quiet space for individual activities, addressing dependability issues in handling users' service problems, building a comfortable and inviting space, and providing modern equipment that lets users easily access needed information.

Evaluative reports

Research and Liaison Services Task Force

The RLSTF recommends exploring a closer connection to the Writing Center (located in the LC), and echoing their model for consultative services by appointment. A co-location of service points is also recommended to free up space, reduce user confusion, and encourage closer work between service point staff.

Access Services Workflow Review Task Force

Many ASWRTF recommendations center on creating a co-located or single service point in the LC, as well as necessary supports for this change, such as standards for a common knowledge set for all service desk staff, software to support the service point's communication and functionality, and library-wide customer service training.

Digital Strategies Group Strategic Plan Implementation Task Force
Related to the LC, the DSGSPITF recommends the development of a formal marketing plan that promotes library services, acknowledging that, for many services, we use a "service desk model" where we wait for users to approach us instead of pushing out information about the library.

Marketing Work Group
The MWG recommends the adoption of a coordinated marketing orientation across the libraries, which involves focusing on our user needs instead of products. They also recommend the development of personas (fictitious characters that represent different user groups) to better understand user needs and to tailor services and messages to these groups.

Discussion

While this was a large and time consuming project, we were able to leverage past and ongoing assessment work, demonstrating the value and sustainability of a strong assessment program. We used practical, scalable, and easily duplicable methods to research the use of our current LC and emerging student needs. Based on the review of findings, recommendations include a phased plan to transform our LC over two years.

Recommendations include combining multiple service points into a co-located service area to address issues identified around confusion and difficulty finding help and general awareness of services. We also propose expanding and consolidating our Digital Media Lab and MakerBot Innovation Center, based on similar feedback about lack of awareness of services. The creation of a Writing and Research Center is recommended to further consolidate service points in the LC, leverage institutional affinities, and to respond to changing research consultation models. Updated group work areas are recommended to address changing technology needs and student trepidation about navigating group workspaces. Finally, the implementation of explicit "alone together" work areas are recommended in response to the consistent feedback that students wish to work together, yet be somewhat sequestered.

All of these changes have implications for major organizational and staffing changes. As we had suspected, the assessment of a multi-faceted, rich learning environment requires multiple methods to help create a full picture for indicating efficacy. While the working plan of the assessment team tasked to review the LC was complex, it was necessary, and, while answering many of our questions, has led us to ask many more. The formation of a Co-Located Service Desk Task Force (CSDTF) and subsequent working groups was only the first of many steps we will be taking toward realizing the transformation of this space. This group has started working on identifying how to consolidate most of the services in the LC into one area, beginning with identifying shared support goals between areas and tiered levels of support and referral.

Next steps will be identifying a staffing structure for this shared service area; it will be a blend of student and full-time staff, with predominantly student peer support available. The CSDTF is conducting their work in collaboration with several other groups in the library responsible for service quality and knowledge, such as Customer Service and Common Knowledge Task Forces. These groups focus on customer service levels and support staff knowledge, as well as training across the libraries.

With the next phase of our work—investigating the drastic change of service provision and major organizational change—we are looking to create narratives from our library staff and perceptions of this change. We are hoping to run a series of in-depth interviews to help us paint a picture of the perception of organizational change, and how best to move forward with cultural shifts in our libraries. This type of assessment takes time, commitment, and consistency—and we are prepared to continue on this path.

Conclusion

Transforming an existing LC is a large undertaking, but leveraging some ongoing assessment projects and their findings while creating a few project-specific methods proved to be an effective strategy for creating a robust picture of student needs. Both qualitative and quantitative methods were used by a Learning Commons Assessment Task Force to develop recommendations on the LC transformation. Because the co-located service area recommendation will create organizational change and have a direct impact on staff, an additional group was formed to focus on implementation, and additional

work is being done to address the associated organizational change.

A special thanks to Carol Will, learning commons coordinator, and Krista Harper, professor of anthropology, for their involvement in this research and continued efforts in helping us all to better understand our user population.

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Consulting Detectives: How One Library Deduced the Effectiveness of Its Consultation Area and Services

Camille Andrews and Tobi Hines
Cornell University, USA

Managing multiple service points, including those of external stakeholders, has been a challenge for Albert R. Mann Library at Cornell, given the varying hours of service, lack of visibility and awareness about service points, and the limitations of shared space. In the fall of 2015, after a comprehensive investigative report, the library piloted a new consultation area that brought together several consultation services that had been scattered throughout the library—including library reference, GIS, writing help, and data and statistical services—to help alleviate these issues. Hear how the library used a mixed-methods approach involving surveys, space observations, and transaction data analysis to design a centralized consultation area and measure the effectiveness of the new location and service design. The results have indicated both user and staff satisfaction with the new space, suggested valuable improvements, and impacted our final recommendations for consultation services and eventual plans to transition to a new consultation reference model. This paper will be useful to any library considering its own public service and space redesign.

Introduction and Purpose

In recent years, a trend in academic libraries has been to combine service points in an effort to provide patrons with a "one-stop shopping" experience. The decision to integrate service points is frequently motivated by staffing concerns,[1] a decrease in both circulation statistics and reference interactions,[2] and the desire to create a more seamless user experience.[3] The most successful models seem to be those that attempt a pilot of their new service model prior to full implementation, as well as those libraries that solicit opinions and feedback from staff in order to create a sense of "buy-in" from those who would be most affected by the changes.[4] Many of these attempts have been less than successful, however, due to challenges with the cross-training of students and staff,[5] and the fact that while these libraries often combine reference and circulation staff at a single location, the actual services have not been fully integrated.[6] With this backdrop in mind, we assessed the service point model at Albert R. Mann Library at Cornell University, consolidated our circulation and printing help desks, and piloted a new consultation area to improve the current model for the benefit of both patrons and staff.

Design and Methodology

Albert R. Mann Library, which serves the colleges of agriculture and life sciences and human ecology at Cornell, had three main service points on its first floor: a large circulation desk that checks out books, course reserves, interlibrary loan items, and a variety of technology and A/V equipment; an information and research help desk by the front entrance to the library that provides reference assistance; and a printing help and poster printing service desk called the Stone Center help desk located between our most active classroom and our public computing area. Over time, the library had also partnered with other university groups, such as our writing center and statistical and data help services, to offer consultations at various stations around the library during specified hours.

Noting the declining numbers of reference transactions, confusion from patrons on where to go for various services, and the need to free up librarian time for ever-increasing outreach, instruction, and liaison endeavors, a task force was appointed to examine library service points and make recommendations regarding consolidation or relocation. The Service Point Task Force was particularly interested in deciding whether and how to consolidate some combination of the three main service points in addition to improving the visibility of the library's internal and external partner consultation services. The task force approached the issue of whether and how best to integrate the various service desks within the library with an assessment plan that included: a literature review; site visits to institutions that had implemented a consolidated reference model; focus groups and interviews with students and staff; student

surveys; and a prototype of the reconfigured space to see what adjustments needed to be made before purchasing any new furniture or technology. The initial literature review and site visits left task force members excited about changes to come and full of ideas about potential improvements.

In February 2014, the library's assessment and communication unit helped facilitate several focus groups with our library users and staff to learn what worked in terms of signage and desk configuration, as well as the issues users encountered when trying to figure out which desk to approach for what service (see Figure 1). Users were asked where they expected to find help with various services (e.g., research help, checking out items, printing a poster, etc.) and gave their feedback on the current configuration, much of which contradicted ideas that the task force had formed and served as a reminder of the importance of understanding user needs before making any changes.

In fall 2014, the task force did quick interviews and surveys to get feedback on patrons' opinions regarding service point signage and terminology. We found that at circulation, if users knew what that term meant (which was not guaranteed even though the majority of our respondents were upperclass or graduate students), they expected to be able to check out materials (especially books; though some knew about laptops, course reserves, study rooms, and other equipment, some were unaware that other items are available) and find or get help with everything (including basic research help, known item searching, directions, and policy questions). Our information and research help desk was clearly a place where respondents expected help with: research papers and projects—not just known item searching but help finding unknown items; starting research and picking databases or resources; thinking about research techniques, particularly searching catalog and databases; and getting personal attention from a librarian or someone who could answer questions about directions and basic library information—call number locations, hours, etc. Respondents were generally confused about the purpose of our Stone Center help desk; they had a vague idea it was a desk for computing, printing and software help, but were not sure. They also conflated our library workshop classroom and our computing center (both confusingly called Stone).

Key findings and recommendations

Key focus group findings:	Key recommendations:
• When patrons know where to find the services they need, separate service points with service-specific workflows best serve both patrons and staff. • There was a general lack of understanding among patrons and student staff about the function of the Information and Research and Stone Center help desks as points for reference and research assistance. • Undergraduate students are not comfortable getting research help at the Information and Research help desk because it is highly visible and in a relatively quiet space, meaning their conversation might be audible to nearby students. • All patron and staff groups identified as important a quickly accessible and highly visible first point-of-contact near the entrance for directional questions and quick reference help.	• Improve signage directing patrons to services, including a list of services available at each desk. • Revise staff training to include an understanding of services provided at all service points. • Move in-depth reference and research services to an area with ample workspace, technology, low barrier seating, and minimal audibility to surrounding areas. • Revise and implement payment procedures for poster printing at the Stone Center help desk. • Merge Stone Center and circulation services at a central point near the technology. • Replace the current Information and Research help desk with a stand-up, simplified desk ("concierge desk") near the library entrance within sight of the circulation desk, staffed during all library hours with highly trained student staff and/or reference assistants.

Findings from Pilot Consultation Area

Armed with this information, in June 2015 the library consolidated the poster printing and circulation desks, cross-trained staff, and put up new, eye-catching signage, which not only improved discoverability of our services but also increased our desk coverage, having only one service desk to manage. In the fall 2015 semester, we repurposed furniture and technology to create a pilot consultation area on the first floor near the library entrance, with workstations for all of the various consultation services housed in the library, as well as informal consultation space with soft seating and mobile LCDs. Throughout the semester, a couple of iPad stands were placed by the entrance and in the back of the consultation area. These displayed a survey that users were encouraged to take before leaving the area (they could also take a card with the link to the survey or were e-mailed later as part of a consultation follow-up). Thirty people completed this survey from October to December 2015. At the end of the semester, all staff (library or external consultants) who worked in the consultation area were also e-mailed a survey asking what worked and what needed to be improved; 12 staff members completed this survey. We also had our student reference assistants use our Suma mobile space assessment tool to track how many people or groups used the consultation area after 6:00 p.m. when the

area became open study space. Finally, we did an analysis of reservations for the consultation area and of entries in our homegrown public services statistics system.

The preliminary survey of staff and users of the new consultation area, as well as space observations, found that the consolidation of service points was an improvement in service. Both patrons and staff found the new area to be comfortable and useful, and the dual screen monitors at tables were more popular than our soft seating. Our lowest rankings were on noise level, signage and discoverability, and privacy (see Figure 2). Besides actual consultation questions, most other questions related to discoverability of the area and consulting services, identifying consultation hours and specific desks, and arranging consultations (see Figure 3). Only a limited number of people throughout the semester (15 people and 14 groups) took advantage of this area for open study after 6:00 p.m., though anecdotally we knew students were using any unoccupied workstations during the day, leading us to believe that there is a demand for this study space, but its availability was not evident enough. Finally, the number of consultations taking place in the area exceeded the number of actual reservations, indicating, along with anecdotal feedback, that the reservation and calendaring system was difficult to use.

This feedback resulted in the following modifications and recommendations for the next iteration of the consultation area:

- More acoustic and visual privacy and noise reduction was needed.
- The space should be more distinct from the rest of the first floor.
- Better technology is necessary—faster desktop computers with dual monitors and remote desktop capabilities; LCDs for screen sharing/collaborative work should be "plug and play."
- Improved digital signage and discoverability of services (i.e., when consultants are in/out, when area is available for public use) was necessary.
- A simplified calendaring/reservation system would be beneficial to staff.

Consultation Area 2.0

The Service Point Task Force put together a proposal in the spring of 2015 to address each of the key recommendations from our assessment of the pilot space and make improvements to the layout, technology, and furniture to increase the effectiveness of the services offered in this space.

1. **Acoustic and visual privacy**
   To address these ongoing issues, we have purchased sound-dampening panels that we will make mobile so that they can be moved around the consultation area as necessary to help cut down on visual and acoustic distractions. These panels are designed for high-traffic public spaces, and are made from durable fabric that can absorb up to 95% of echo, reverberation, and mid- to high-frequency sounds. In addition to the acoustic panels, window tinting film on the classroom windows facing the consultation area would provide a greater degree of privacy to patrons in both areas.

2. **Distinct space**
   Using new furniture in a complementary color scheme will help patrons identify the consultation area from the rest of the first floor and will make the space easier for patrons to find when they come to Mann looking for these specific services. The furniture we have selected is durable and versatile, similar in design to much of our furniture but with colors and finishes that set it apart from our other spaces. We also enclosed the space (while still maintaining a level of visibility from other library service points) using shelving for our current periodicals, installed a reading area directly around the consultation area, and removed the busy, noisy public computing area from this part of the first floor. This will not only help make the area more distinctive, but also will help with noise reduction. We are also recommending a collaborative workstation with an LCD for screen-sharing to accommodate larger groups.

3. **Better technology**
   One of the biggest complaints we received from staff working in the consultation area is that the technology is too slow, and that they frequently have problems connecting to their office computers via remote desktop. To help solve this problem in a cost-effective way, we have proposed purchasing thin client computers (lightweight computers purposely built for remoting into a server) with dual monitors running Desktop Everywhere, a service offered by Cornell Information Technologies (CIT) for a monthly fee that allows departments to offer their users a full desktop environment.

This arrangement means the computers will consume less power and have a lower price point. This also allows us to push updates, patches, and software centrally through Cornell Information Technologies (CIT) instead of on each machine, saving staff time and effort. As we have mentioned, we also recommend a mounted LCD in our collaborative workstation with a simplified connection setup for seamless screen sharing to support group work.

4. **Digital signage and discoverability of services**
More consulting services have been added to the consultation area since its pilot in fall 2015, giving us a total of seven different consulting services working out of this area (though we hope to add more in the future). Patrons reported that finding the specific services they were looking for was somewhat difficult, and the consultants requested more prominent signage for their workstations. Rather than having just one display at the entrance, we plan to incorporate digital signage at each of the workstations that would display not only the name of the service, but the hours/availability of the consultants as well. By using tablets and stands at each workstation, with digital signage specific to each service, we believe we can improve the discoverability of these services. We also plan to switch from using a homegrown hours management system to using LibCal, a calendaring and event management platform from Springshare, for managing the hours for consulting services.

5. **Simplified calendaring/reservation system**
Reference librarians have expressed some frustrations with using Outlook for reserving the consultation area workstations. Additionally, the consultants for the external services are not currently able to make reservations for their workstations, so library staff are responsible for making all reservations. Switching to LibCal for managing these reservations, as well as hours management, would lessen the burden on library staff, and would allow us to manage the hours for all the services and workstations in one system. This change would also give us the option of making these workstations reserveable by the general public after 6:00 p.m., when the consultation area is open for use. The Service Point Task Force will continue to work with Mann reference staff and the consultants from the other services to streamline the calendar/ reservations/ hours management workflows.

Lessons Learned and Next Steps

The investigation and improvements to the service points within the library are an excellent example of the use of a mixed methods approach to assessing user needs and spaces/services. However, as with much of the assessment that libraries do, this project was done with a particular budget, timeline, and desired outcome in mind, and a lot of time and effort was spent to collect the necessary data. In future service design changes, more lightweight methods like customer journey maps, quick interviews, and additional methods, such as those from Service Design Tools (http://www.servicedesigntools.org/), will allow us to gather feedback with a lesser investment of time than focus groups or site visits.

Additionally, literature reviews and site visits sparked great ideas but those ideas often did not match the desires of our particular user community. As tempting as it might be to introduce services or spaces because it appears to be a national trend, it is important to remember that no other institution can do the work for your library; each library's user community requirements may be different.

Choosing research methods that will get the answers you need is critical. Our signage surveys and quick interviews on what people thought they could do at each desk and what names they might suggest were somewhat useful in identifying the disconnect between what users expected to do at each service point and what was actually possible; however, beyond that initial identification, users often did not have great suggestions about what the desks should be called and these methods did not help us make any decisions about consolidation. Using mixed methods can help address multiple or complicated research questions; a single approach might not give you the data you need but a combination of qualitative and quantitative methods should give you a more holistic picture of what changes are necessary.

Making changes on a pilot or preliminary basis can help trial a new service or way of doing things without having to invest significant funds before knowing if it will be successful. However, even the promise of temporary changes can be overwhelming if it is a service point that affects a number of staff. Make changes one step at a time, and building buy-in

and momentum with staff who see the success of previous changes can be helpful.

Finally, listening to what the data from multiple mixed methods are telling you can lead to space and service changes that can improve the efficiency and utility of the entire library. The success of our experience with the consultation area is prompting us to look at other changes in services, like the use of reservable consultations and more reservable spaces and equipment in the library, and we will continue to make sure that our patrons' feedback is incorporated in ways that make the library an efficient, personalized experience for all.

Note: for pictures of the new combined circulation and technology desk, consultation area, and proposed consultation update, see our presentation at http://libraryassessment.org/bm~doc/andrews-consulting-detectives.pdf.

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Figure 1: Focus groups

Stakeholder group	Type of interaction	Number of participants
Student staff (UG & GR)	Focus group	9
UG patrons	Focus group	5
GR patrons	Focus group	4
Circulation staff	Structured discussion	12
Reference staff	Structured discussion	7

Figure 2: Rating of Consultation Desks and Experience by Users

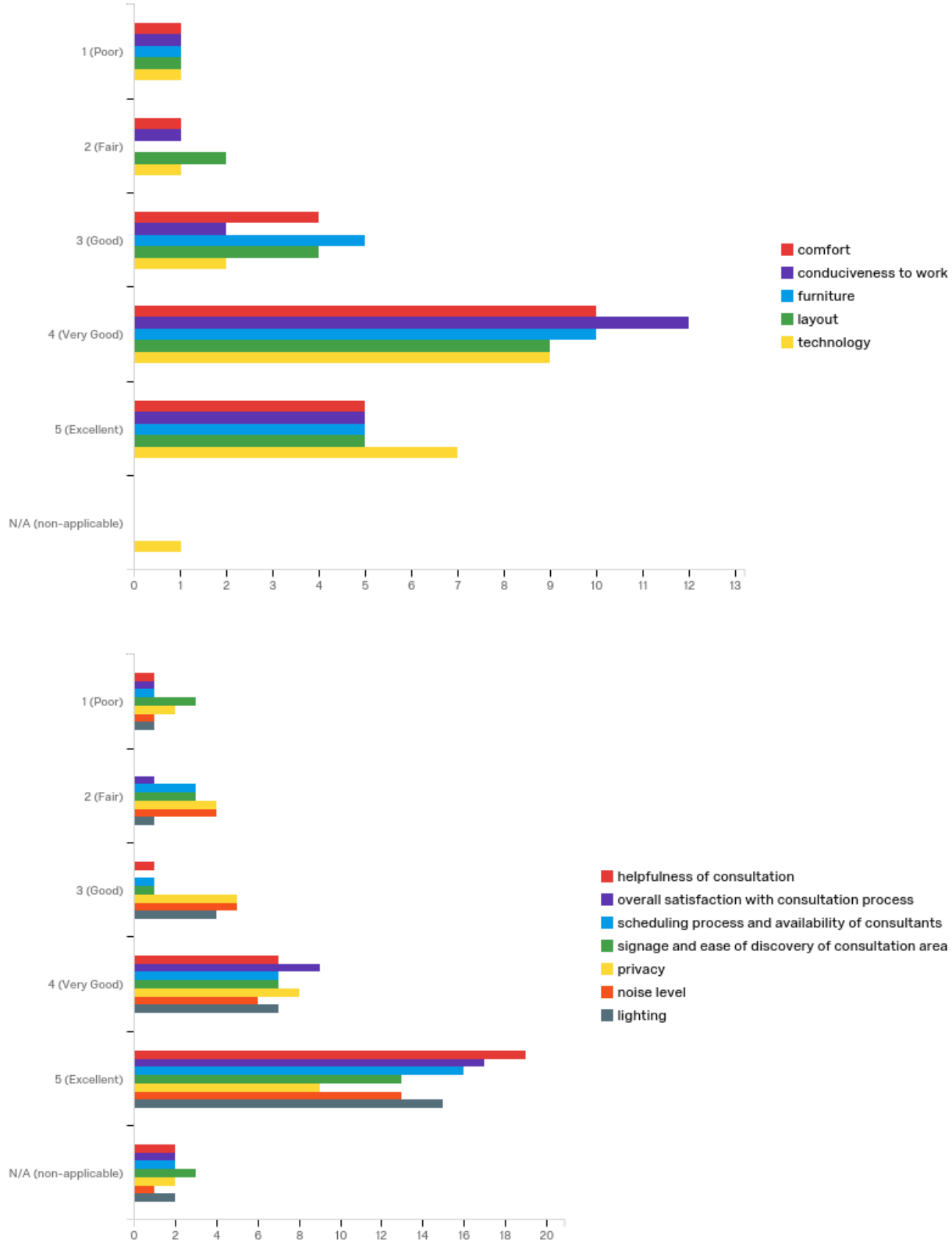
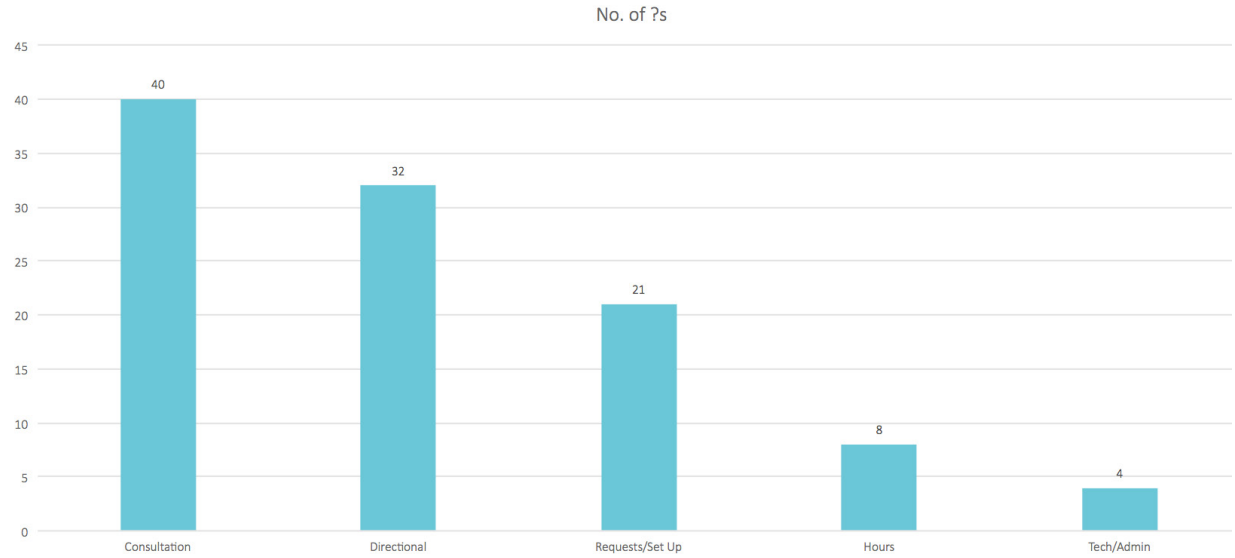


Figure 3: Questions about Consultation Area



It's All About the Learning: What Students Say About Their Learning in Informal Learning Spaces in the Library

Susan Beatty
University of Calgary, Canada

Abstract

Most learning occurs outside the classroom, yet research on the relationship of learning to informal learning space is in its beginning phases in higher education. Temple notes the dearth of research on learning space in higher education.[1] He comments that teaching and learning in the university includes the need to understand the impact of university space. Academic libraries are being renewed and designed for learning. However, little is known about what sort of learning goes on in the informal library spaces. A study undertaken in winter 2016 asked students to consider the relationship of informal library spaces to their learning choices. In a recent multi-site observational study of students in libraries, May and Swabey concluded that there is a need for more research and a method to clearly demonstrate the link between libraries and learning.[2] This paper focuses on students' perception of library spaces and their learning activities by focusing on their approaches to self-regulated learning and environmental self-regulation.[3] It also discusses key learnings, which serve to provide some understanding of the relationship between libraries, space, and informal learning behaviors in an academic library, which may be applied to future informal learning space development in libraries.

Background

While the visit data validates the success of the Taylor Family Digital Library (TFDL), and student commentary on the facility has been generally positive, there has not been any assessment of the effectiveness of the open learning spaces from the combined view of design and learning. Acknowledging that libraries know little about intentional learning and how spaces would better support learning, Bennett comments on the need for libraries to move beyond the planning of things in spaces to the planning for learning in spaces.[4]

Over the past 10 years, learning space design has caught the attention of a number of architects, designers, academics, and librarians. Design researchers have emphasized the need to investigate the design of higher education learning spaces to understand the learning environment as it relates to the emphasis on new types of learning in higher education.[5] Keppell and Riddle note that students need to recognize and perceive what the space has to offer in order for the space to be fully utilized.[6] As Boys states, "we need a better understanding of what matters about space for learning and the development of more diverse range of actual spaces in higher education... across... informal requirements..."[7] This study attempts to find out what students think about our learning spaces.

Self-regulated learning

Students who are successful learners tend to establish a learning process that works for them. This process has been called self-regulation or intentional learning. Zimmerman notes in his self-regulation model that the student's environmental arrangements are positively related to achieving learning goals.[8] This study explored students' self-regulated learning through their perception of the environmental assets in the TFDL and their learning behaviours in the TFDL environment.

Taylor Family Digital Library

The Taylor Family Digital Library opened in September 2011. While many academic libraries have a defined space for informal learning, the TFDL features well-designed informal learning spaces deliberately located throughout the six floors of the building. The result is the distribution of a variety of learning spaces well used by students. Students come to the library to socialize, relax, work in groups, complete their assignments, study, and learn. The spaces are occupied by students working alone, beside others, or in groups of varying sizes, at tables (small or large, square or round, isolated or clumped); study carrels; quiet reading rooms or lounge-like open spaces; workstations or workrooms, to list but a few of the variety of spaces and features.

Research study

An earlier unobtrusive study of student learning behaviors in the TFDL highlighted the diversity of learning activities students undertake in the library and concluded that students intentionally choose to conduct their learning in the library and also appear to deliberately choose specific spaces in the library to do so.[9] The question became, then, does the space design in the library make a difference to their choice of space to learn? And, is it possible to determine which elements of the informal space appeal to the students, and why? One way to find out what students think of the learning spaces is to ask them. A study based on interviewing students about their activities and perceptions of learning spaces in the TFDL was undertaken in winter 2016.

Methodology

Twenty-one students were recruited using social media and digital and print posters in the library. The students were screened to ensure that they studied regularly in the library and that they were registered at the University of Calgary. Each volunteer was given a $25 gift card at the end of each interview. The semi-structured interview asked students to describe where, how, and why they choose to learn in the library. They also reviewed 15 photos of various informal learning spaces in the library and talked about their impressions of the spaces as they relate to potential learning activities in general, as well as their learning preferences and behaviours. Students were prompted to consider how the various affordances in the design might affect their choice of a learning space. Students were also asked how they learned and to consider generally how the library spaces assisted them in their learning activities in the library.

Results

Demographic data

A total of 21 participants were interviewed (11 female). Eleven participants were students in science and engineering disciplines, and 10 participants were students in arts, humanities, and social sciences disciplines. Participants were mostly from undergraduate programs (N=20) with 11 participants in second year or below, and 9 participants in third year or above. One participant was in a graduate program, and three had completed a previous degree. The majority of the students (N=18) reported coming to the library between three and five times per week.

Rationale for choosing a space

Students often agreed on the affordances in spaces that support learning, even if they would not use a particular space themselves. They would comment on which types of activities might occur in each space. Different spaces could be used for the same type of learning activity depending on the type of learner. While they could see the opportunities for learning that each space afforded, the students also had a preference for a particular space determined by the type of work they were doing and they type of learner they were. Below are the key affordances the students commented on:

- **Sound and lighting**: Environmental variables were mentioned most often; specifically, sound level received about 2.5 times more comments than lighting. Students mostly prefer quieter spaces, but there were some who thought some spaces would be too quiet and would prefer a space with noise, or who would bring music to listen to while they were studying, regardless of whether they were in a quiet or noisy space. Natural lighting was preferred over artificial or desk lighting. While hard to control, ambient factors can contribute or take away from an atmosphere conducive to learning.
- **Distraction:** Students report that potential for distraction is an element in their decision making. Some wish to avoid distraction, while others report a need for distraction to either encourage concentration or serve as a mini-break while studying. Some students would comment on distractions such as too many people, too much noise, or too much traffic as a space that would not be a good place for them to learn, while others would say it was the perfect spot for them.
- **Openness**: Several students (N=10) also commented on the feeling of openness. Some students seemed to prefer open areas, which were defined as areas where there might be high ceilings with natural light, or not isolated or confined, while others would comment that a space was too open, with too many distractions. The same factor can be a pro or con depending on the learner.
- **Comfortable**: By choosing the right space for their learning, many students would describe it as being comfortable. The notion of comfort and being relaxed and therefore being in the right mood for learning is a key element for their learning. Some noted that a space would be too comfortable and therefore not conducive

to studying. Students recognize what works for them, and also what does not work for them.

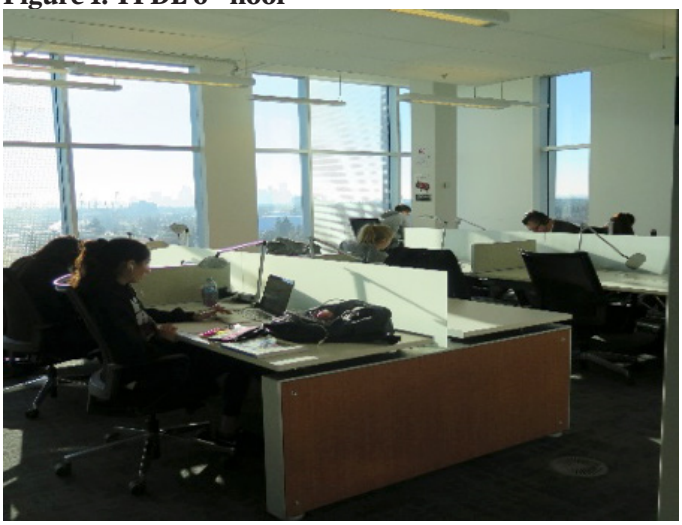
- **Outlets**: While not all students reported this need, for those who needed an outlet, the location of the outlet would determine whether a table, carrel, or other workspace would be considered a best spot. However, for those who did use a laptop and the outlet was not working in their favored spot, they would still choose the spot by virtue of the other elements that they favored.
- **People versus isolation:** The advantage of having other learners around was noted by most, with a few, however, preferring isolation. They commented that they could interact with friends to help with the learning or to have a mini-break, or be motivated by other people working and feel part of a learning community. They were aware once again of the atmosphere that supported their learning and provided motivation to learn.
- **Furniture and space definition**: Students commented quite frequently on the need for enough desk space. Tables with dividers, workstations with dual monitors and large desk spaces, study carrels, or single tables with an obvious seating for one were remarked upon as being big enough for all their "stuff." If there was not enough space, e.g., a smaller workstation with no dividers, they were aware of it, and kept their stuff in their backpack until needed. Working in a smaller space, while seen as necessary in order to share common desktop spaces, was not preferred. They preferred spaces where "their space" was defined, either by dividers, low barriers, or single seating tables.

What is most apparent from the students' comments is that their best choice of flat workspace had to be the right combination of elements (lighting, sound, distractions, people, openness, seating, outlets) in order for them to achieve their goals.

Examples of spaces

The three figures below illustrate some of the informal learning spaces in the TFDL. Each of these spaces offers a variety of features that some find appealing and others do not. Figure 1 is an area of the top floor of the TFDL in a secluded corner, with little traffic, a great view, and separated desk spaces. Students generally commented positively on the view and windows, but gave mixed opinions on the value of the presence of others.

Figure 1: TFDL 6th floor

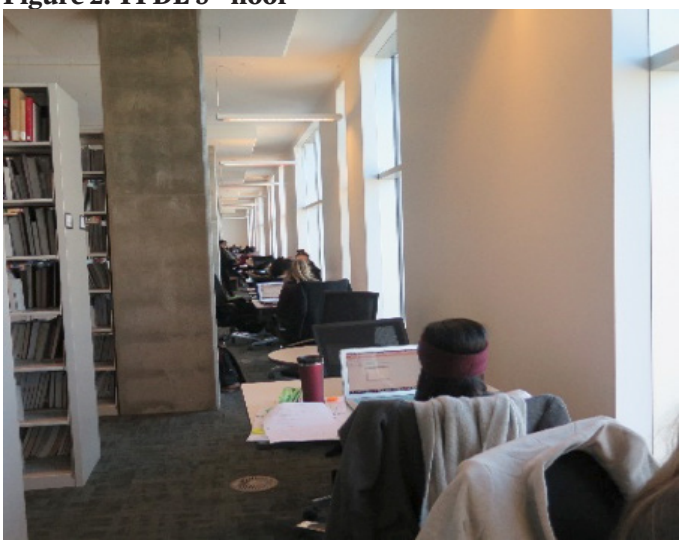


"You feel the sense of learning community."

"You might have people right in front of you...that's a little bit distracting."

In Figure 2 below, an area with single tables situated between windows/walls and book shelves, most students found the view appealing, and the wall as a motivator for focus, but some others found it too cramped, hot, and distracting.

Figure 2: TFDL 5th floor

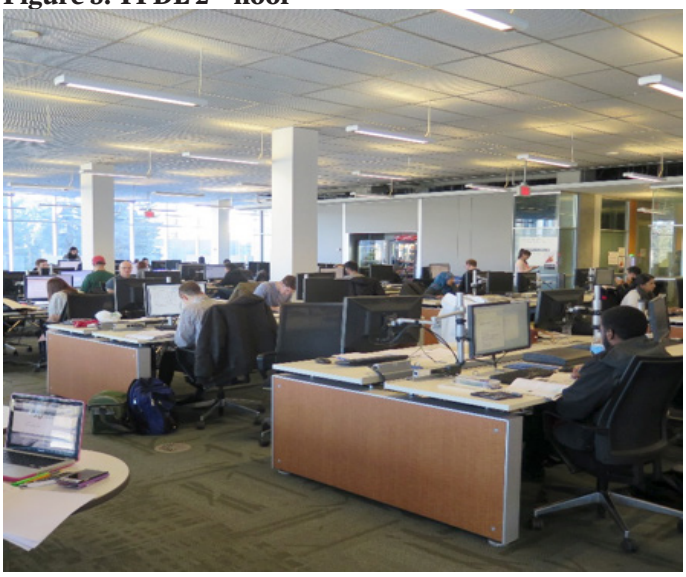


"It gives you a view... it's also close to the wall... it gives you a feeling of focus."

"I'd be too busy trying to figure out what the people ahead of me are doing."

Figure 3 below, on the second floor, is typical of the computer workstations. Students generally recognize what they can and cannot do there. While some will choose this space because it is obviously an open, social space, allowing for conversation and general group work, others recognized it might not provide the best environment for them primarily because of potential distractions within the space.

Figure 3: TFDL 2nd floor



"You just run up the stairs, print it and head out."

"It just feels too busy to really sit down and focus on anything."

Value of library space

While not a focus of the study, it became clear that students understood the value of library space and its relationship to their academic career. The following

four elements describe the values the library has to them as a learning place:

- **Functionality**: It is a place where you can accomplish many of your goals for the day, e.g., printing, reading, writing, social meet-ups, relaxation, mental breaks, without leaving the building. Students have a plan when they come to campus. Those who are coming to the library generally map out their activities and then take advantage of the spaces and services offered in the library to achieve their goals. This holds true for all kinds of learners, from first year undergraduate to graduate.
- **Learning atmosphere**: The library is a place where you are surrounded by your peers. The learning activities of your peers influence and support your choice of activities and the achievement of your goals. The students often described it as a "learning community" even if they were learning on their own.
- **Student space ownership**: The potential for ownership is meaningful for students. As self-regulated learners, they must be able to regulate/organize their environment in order to support their learning and keep it regulated without disruption. The library offers the flexibility and variety of spaces for this to happen for all types of learners.
- **Library as academic symbol**: Students have awareness that their academic learning and education is something special. They see the library as a symbol of their experience and speak of the library as an integral part of their academic experience.

The ah-ha moment: open to learning

The value of library learning spaces is that, with their preferred environmental elements in place as noted above in combination with their perceived values of library space, the students can achieve what they seek, which is comfort and motivation. Students often spoke of being comfortable, and when asked what they meant it became clear that they were talking about the mental and emotional comfort that "their" learning space would afford them. When pressed to discuss what is it about their environment that makes them comfortable and how it was related to learning, they described the need to create a feeling of openness to learning and a motivation and perhaps energization that, when they felt it, affected them and supported their learning. In summary, students know how and where they learn best and they choose their surroundings in order to be successful.

Environmental self-regulation and learning behaviours

The purpose of this study was to find what relationships might exist between students' self-regulation of their environment in the TFDL and their learning. The various representational spaces that were shown to the students elicited a variety of responses from "that is my spot" to "I would never work there." Students were able to identify the elements of the spaces and were then able to indicate whether it would be a space to their liking, and what they would do there.

Students are aware of their goals. Based on what works for them, they then make choices generally proscribed by time, priorities, and their preferences for spaces. The positive correlation of type of space, type of activity, and way of learning enable them to be comfortable and open to learning. Referring to self-regulation, then, it appears that the learning environment may be key to encouraging and motivating students to keep on learning.

Conclusion

Students choose library spaces that support their learning preferences. They are aware of how the need for their learning environment influences their space choices. There is, therefore, a relationship between environmental self-regulation, learning behaviours, and learning space design. The key is not whether students like a space but rather it is how they see it relating to their successful achievement of their goals. In order to make our library spaces more effective for students, our informal learning space design choices for libraries should be intentional, based on an understanding of how students learn and regulate their learning environment. We need to talk more with students to find out how the design of informal library learning spaces can support their learning. In that way, our decisions will be more informed and our spaces more effective as learning spaces.

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Public Computer Workstation Use: Visualizing Occupancy

Jeremy Buhler
University of British Columbia, Canada

Abstract

Occupancy rates for public computer workstations at the University of British Columbia Library vary considerably depending on the desirability of the work space, convenience of the location, time of year, and type of computer. This paper describes a method of calculating and comparing occupancy to inform decisions about the number and placement of workstations. An online dashboard created with Tableau Public makes it easier to compare use patterns and establishes a foundation for target-based resource management (see https://goo.gl/SsztxI). The method can be applied to other resources and services such as laptop and equipment lending programs.

Introduction

The University of British Columbia (UBC) Library maintains 590 public computer workstations distributed across 11 branches. Despite this large investment, in recent years there has been limited systematic review of the library's public computer infrastructure. We know the computers are frequently used, but do we know that we have the right number? Are they in the locations where they can provide the greatest benefit to library users?

In UBC Library's current financial environment these are pressing questions. The budget for public workstations is insufficient to upgrade all computer hardware as often as desired and we know from surveys that aging computers frustrate many UBC Library users. Could UBC Library still meet demand if it maintained fewer computers and invested more in regular upgrades? If not, is demand so demonstrably high that it would be foolish *not* to increase the workstation budget?

This paper describes a way of using data about public computer workstation use to calculate occupancy and help allocate resources where they are likely to provide the greatest return on investment. Emphasis is on the practical application of a simple dataset using tools that are free (Tableau Public) and widely available (Microsoft Excel).

Preparing the data

Library activities are often monitored with rudimentary counts plotted over time: the number of reference questions, gate count, loans, etc. Likewise, computer workstation use is sometimes measured by the number of login sessions or the number of unique users during a time period. One limitation of this method is that it hides fluctuations within the time period that may affect user experience. Total counts flatten peak periods, for example, and do not reveal how often a user might be turned away because all computers are in use. A more nuanced and informative measure of computer workstation activity is occupancy, the number of workstations in concurrent use at any given time.

At UBC Library each login and logoff event on public workstations is timestamped and recorded in a local database along with the computer ID and location. Structuring this data as shown in Figure 1 facilitates visualization and analysis with Tableau software, which in turn can convey a story about workstation activity to a wider audience. Note that:

- *login* and *logoff* events are recorded on separate rows;
- *login* events are identified with a positive number (1), and *logoff* with a negative (-1);
- rows are sorted in chronological order by *timestamp*.

Figure 1:Structure of source data about computer workstation use

Login/ off	Computer ID	Location	Timestamp
1	32	Level 3 Stacks	04/01/2016 8:13
-1	32	Level 3 Stacks	04/01/2016 8:26
1	12	Level 3 Stacks	04/01/2016 8:49
1	25	Level 3 Stacks	04/01/2016 8:53
-1	25	Level 3 Stacks	04/01/2016 9:00
1	14	Level 3 Stacks	04/01/2016 9:02
1	32	Level 3 Stacks	04/01/2016 9:07
1	25	Level 3 Stacks	04/01/2016 9:10
1	7	Level 3 Stacks	04/01/2016 9:13

Once the source data is structured in this way it is relatively easy to calculate additional values, including occupancy, using spreadsheet software such as Excel. UBC Library's analysis of workstation activity requires the three new columns shown in Figure 2:

- *Occupancy level*. The number of workstations in concurrent use at any given time.
- *Minutes at this level*. The amount of time elapsed before the occupancy level changed.
- *Session minutes*. The duration of each user session (calculated on login rows only).

Figure 2. Source data with additional fields calculated in Excel

Login/ off	Computer ID	Location	Timestamp	Occupancy level	Minutes at this level	Session minutes
1	32	Level 3 Stacks	04/01/2016 8:13	1	13	13
-1	32	Level 3 Stacks	04/01/2016 8:26	0	23	
1	12	Level 3 Stacks	04/01/2016 8:49	1	4	49
1	25	Level 3 Stacks	04/01/2016 8:53	2	7	7
-1	25	Level 3 Stacks	04/01/2016 9:00	1	2	
1	14	Level 3 Stacks	04/01/2016 9:02	2	5	31
1	32	Level 3 Stacks	04/01/2016 9:07	3	3	30
1	25	Level 3 Stacks	04/01/2016 9:10	4	3	12
1	7	Level 3 Stacks	04/01/2016 9:13	5	0	91

Occupancy level is calculated as the running total of the *login/off* column. Each login event increases the occupancy level by one, while each logoff decreases it by one. The value shows the number of concurrent sessions at any given time during the reporting period. *Minutes at this level* is the difference between successive rows' timestamps (assuming rows are sorted in chronological order). Calculating *minutes at this level* makes it possible to determine how much of the time a particular location is above 75% occupancy, for example. *Session minutes* records the duration of each session, that is, the time difference between successive login and logoff events on the same workstation. *Session minutes* can be used to compare activity among workstations: does average session length vary depending on workstation position or type? Which workstations are most often in use?

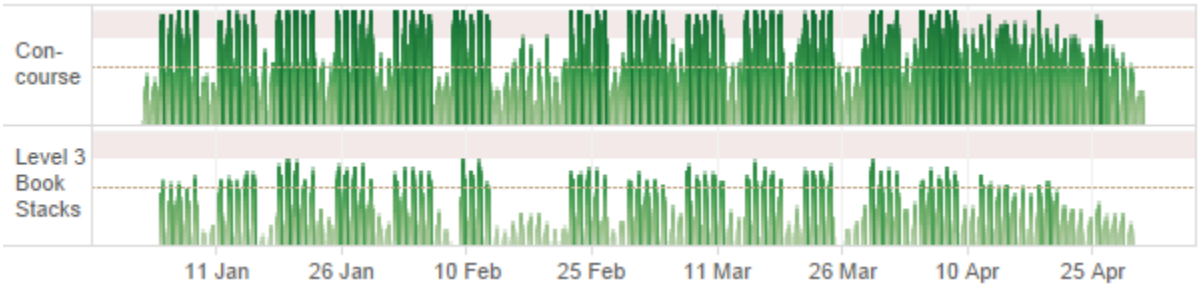
Comparing occupancy levels: time and location

This extended dataset can tell a more compelling story about workstation use. Beyond counting the number of sessions or the number of users, it supports statements like "occupancy rarely exceeds 75% at location X" or "location Z reaches 100% occupancy at least once per weekday during the academic term." From a resource management perspective these statements are more useful but still do not answer the basic "so what?" question. Are these occupancy levels good? Are they bad? Do we need to change anything and, if so, how?

To answer these questions the data must be understood in relation to a comparator or benchmark.The comparison could be against a previous time period, the occupancy at another

location, or a pre-established target. At UBC Library a useful starting point for comparison is location. The UBC Library dataset includes workstation data for more than 25 locations, and visualizing the data in Tableau software (Figure 3) makes it easier to see, quantify, and communicate differences among them.

Figure 3. Occupany levels at two UBC Library locations, January–April 2016



The height of the green bars in Figure 3 represents occupancy levels at two locations in UBC Library's Irving K. Barber Learning Centre. The Concourse is a high traffic area on the entrance level with 24 workstations. The Level 3 Book Stacks has 29 workstations and is a quieter, less visited area separated from the Concourse by a flight of stairs. In each row, the dotted line represents 50% occupancy and the bottom of the pink band indicates 75%. Where the green line reaches the top of the pink band, all computers at that location were occupied. It is easy to see at a glance that workstations in the Concourse were often 100% occupied during this period. It is also striking that occupancy never exceeded 75% in the Level 3 Book Stacks. Even at the busiest times only 22 of 29 computers were in use.

Target-based resource management

Comparing activity between locations is an easy first step toward rationalizing the distribution of resources. The data in Figure 3 reveals that in 2016 UBC Library could have moved seven workstations from Level 3 to the Concourse, reducing wait times at one location with almost no impact on the other. But comparison among locations will not always reveal such obvious opportunities. A more robust approach is to establish targets for workstation occupancy. Here is an example of what a workstation occupancy target might look like:

> During the busiest four consecutive weeks of the year, weekday occupancy for the busiest six hours of the day should be at least 50% three quarters of the time, and 100% no more than 5% of the time.

This sample target describes an acceptable occupancy range that represents a balance between user desires (that a workstation always be available) and financial responsibility (that use be high enough to justify the investment). The balance will likely be different for each institution. A library with a limited budget for workstations, for example, might set the occupancy bar higher and accept that during busy periods students will wait for workstations more often. Regardless of the actual target, this approach helps answer questions about allocation as well as about the total number of workstations required.

A target can also account for seasonal variations in activity. Like many universities there is less activity on the UBC campus during the summer. To ensure resources are available when demand is high, the sample target is based on the busiest four consecutive weeks of the year. Further, within those four weeks only the busiest six-hour block is used in calculations. Early mornings and weekends, periods of relative inactivity, are excluded so they will not unintentionally skew results and obscure the demand during peak periods.

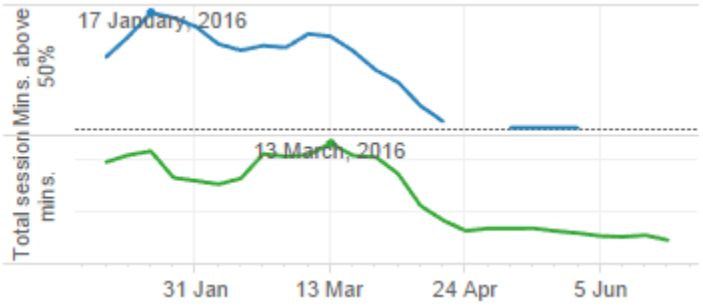
Measuring performance relative to targets: Tableau dashboard

The dataset in Figure 2 contains enough information to measure whether a location meets the target, but not in a format that is easy to read. To make the data more accessible UBC Library used Tableau software to create a dashboard that graphs activity patterns and calculates occupancy for each location. The dashboard viewer can explore the data by selecting among locations, limiting calculations to the desired time period, and estimating the impact of reducing the number of workstations. For reference, a version of the UBC Library dashboard with data from three

locations is available to view and download in Tableau Public (see https://goo.gl/SsztxI).

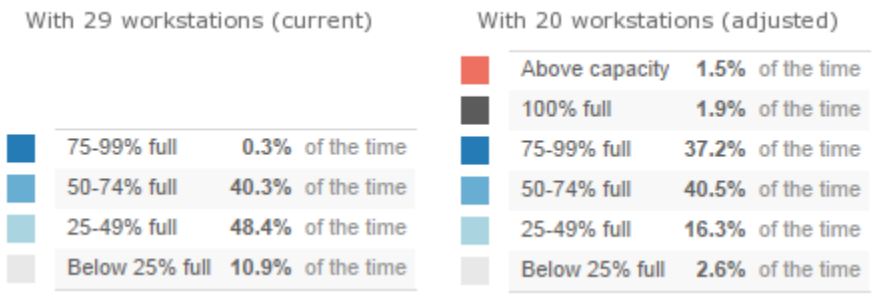
UBC Library's workstation dashboard is designed to measure performance relative to the sample target statement above. For each location, a bar graph similar to the one shown in Figure 3 provides an overview of activity. Another chart indicates how often occupancy was greater than 25%, 50%, and 75%, and how often it was 100%. Optional filters can adjust the occupancy calculations to include only the busiest four-week period and six-hour weekday block, in alignment with the occupancy target. Since use patterns vary among branches, there are also line graphs to help identify the busiest periods for each location, not just for the library as a whole (Figure 4). Once the date filters have been set, a bar graph indicates whether activity was within the target range.

Figure 4. Weekday activity levels: four week moving average.
Labelled dates indicate the start of the busiest four-week period.



For locations where activity was below the target, the Tableau dashboard also provides a planning tool to help determine the optimal number of workstations. The viewer can estimate the impact of removing workstations by changing the number with an on-screen slider; this, in turn, shows a before-and-after picture comparing actual occupancy levels to what they *would have been* with the smaller number. Figure 5 shows a before-and-after comparison for UBC's Level 3 Books Stacks. This location currently has 29 workstations, a number that exceeds demand as was already shown in Figure 3. By adjusting the slider the viewer can find the number of workstations that would have met the target in 2016: *at least 50% full three-quarters of the time and 100% full no more than 5% of the time.*

Figure 5. Level 3 Book Stacks occupancy comparison, peak periods, Jan–Apr 2016



Reducing from 29 to 20 workstations represents a 31% drop at this location. Even so, at 2016 activity levels, the remaining workstations would only have been fully occupied 3.4% of the time during peak periods (the busiest six-hour block on weekdays during the four busiest weeks). Likewise, with 20 workstations the location would have been at least 50% full about 81% of time—compared to 41% of the time at the current level. Presenting this information in a clear, interactive, and accessible form allows a wide audience to explore different scenarios and may facilitate conversations about change.

Despite its practical value, UBC Library's current workstation dashboard remains a rudimentary tool in at least two respects. First, it does not calculate the impact of adding workstations: it can identify *where* additional workstations may be needed but not *how many* are required. Second, the dashboard does not account for changes in workstation activity levels: before-and-after estimates are based on past data and will be skewed in environments where activity levels are trending up or down. These limitations could almost certainly be addressed by someone with the requisite mathematical and software skills. In the meantime even this limited tool stands to improve UBC Library's understanding of activity levels and the management of its resources.

The combination of data and dashboard supports target-based resource management at UBC Library in several practical ways. It is currently being used in a review of the library's computer workstations, but the approach also applies to other resources where session or loan start- and end-times are available. At UBC Library the method also informed decisions about a laptop lending program, and plans are underway to apply it to equipment lending programs.

Conclusion

Evidence-based management of UBC Library's public computer workstations will help improve the library's return on investment in this area. Using accessible tools, the relatively simple dataset described in this paper can help libraries understand their computer use in terms of occupancy rather than the number of sessions, providing a more nuanced picture of activity. Combining visual reporting and monitoring tools like Tableau with local occupancy targets can help libraries make better decisions about workstation numbers and placement, taking some of the guesswork out of planning and making it easier to measure performance over time.

Library Snapshot Day, or The 5 W's—Who, What, When, Where, and Why are Students Using Academic Library Space: A Method for Library User Experience Assessment

Gricel Dominguez, Genevieve Diamond, Enrique Caboverde, III, and Denisse Solis
Florida International University, USA

Abstract

During the fall 2015 academic term, members of the Florida International University Libraries came together to create a team of 18 researchers, composed of members from public and technical services, administration, and systems, to conduct a large-scale observational study founded on the premise of library sweeps presented by Mott Linn (2013). The project received Institutional Review Board approval in October 2015, after all researchers completed IRB training. The goal of the study was to better understand how students use the library facility, interact with its services, and use the collections. This collaboration resulted in the development and implementation of the first ever "Library Snapshot Day" at the Florida International University Green Library on November 3, 2015. Conducted as an experimental study to gain insight into actual versus perceived library use and satisfaction, the study collected qualitative and quantitative data during a three-hour period of peak library usage. The study employed an observational checklist adapted from the Linn (2013) research model, "pop-up" comment boards, and data extracts from the Integrated Library System, Google Analytics, and other automated systems. Designed to reveal factors such as seating availability and preferences, user behaviors, and issues related to building limitations and library policies, the checklist made note of 34 factors, across three major categories (where is this person, possessions, and activities). Observational teams were divided across the Green Library's six public floors. Photographs and observational notes also served to supplement findings. A survey of library users, live tweets, and systems data also served to generate a "big picture" understanding of library use. Data analysis of the 4,100 user observations, 280 comments, and systems extracts have led to fresh and surprising insights into how students interact with spaces and services.

Introduction

During the fall of the 2015 academic year, members of the Florida International University (FIU) Libraries came together to consider new ways to gain insight into use of the FIU Green Library—its facilities, equipment, and collections—and to learn more about general perception of the building and services. A call for volunteers was placed by the then-assistant dean, and a team of 18 researchers was established. Together, these researchers explored the possibility of conducting an intensive, one-day observational study that combined tried-and-true practices presented in the library literature with methods associated with the field of user experience. The resulting study was designed with users in mind, and aimed to better understand user needs and satisfaction, while shedding light on actual versus perceived user behaviors.

The project received Institutional Review Board approval in October 2015, and all researchers completed IRB training before engaging in the study. The study relied on an observational checklist adapted from the Linn[1] research model, "pop-up" comment boards, and data extracts from the Integrated Library System, Google Analytics, and other automated systems to reveal factors such as seating availability and preference, user behavior, and issues related to building limitations and library policies. The checklist made note of 34 factors across three major categories (where is this person, possessions, and activities) and was used to record findings on the Green Library's six public floors. Cell phone cameras were also used to record unusual and intriguing use of library spaces as a way to supplement written findings. Additional data was also collected through a survey of users (distributed electronically), a live-tweeting campaign (hosted by the libraries' marketing representative), and systems data. By combining observational notes and direct user feedback, the team was able to develop a "big picture" understanding of library use. In total, the researchers collected 4,100 observations and

280 comments. Combined with complementary systems data, the findings provided a fresh, multi-faceted look at how students interact with spaces and services.

Background

The Florida International University (FIU) Libraries serve an urban, largely commuter-based population of more than 50,000 students across a variety of academic programs and fields, including undergraduate, graduate, and doctoral candidates. The university boasts two campuses and several satellite locations, though the Modesto Maidique Campus is generally regarded as the "main" campus by students and faculty alike. As such, the FIU Green Library serves as the primary learning resource for students in need of library services and study spaces. Students often describe the library as a safe space for individual and group study, while many also regard it as a "home away from home," particularly those in need of a familiar, quiet place that is conducive to sustained concentration and hours of study. Nevertheless, the library's 2015 distribution of the LibQUAL+ Lite survey revealed a real concern regarding noise, consumption of food, cleanliness, and general appearance of library facilities, as well as the need for upgraded electrical and seating options, findings that are corroborated by reports recorded by the library's reference and circulation departments. As a result, the observational team sought to shed light on these issues by identifying areas of concern expressed by library users in an effort to gather quantifiable data and propose new solutions to existing issues.

Methodology

The idea for what would become "Library Snapshot Day @ FIU Libraries" was based on research presented by Mott Linn[2] in the paper "Seating Sweeps: An Innovative Research Method to Learn about How Our Patrons Use the Library." The concept was then further refined through the application of user experience principles and a review of the literature on library space assessment to quantify library use and satisfaction (see recommended reading in Appendix B). In addition to the literature review, a small-scale study, conducted during the previous academic year by the user engagement librarian, served to inform the development of a workable model for data gathering, and aided in refining the categories for observation and review.

Seating sweeps served as the foundation for the Library Snapshot Day model. These are based on a series of scheduled observations, or "sweeps," conducted at regular intervals over a period of time (say, three times a day every two hours, over a two-week period); the frequency and length of a sweep is determined by the aim of the study. A set of criteria is also identified and used to guide the study and serve as a checklist. These include questions such as: What are students doing? Where are they gathered? What are they carrying? And where are they sitting? For the purpose of the current study, the 34 factors were identified and arranged in a spreadsheet for data gathering and reporting (see Appendix A).

Unlike the average observational study, Library Snapshot Day was designed to provide a single, highly concentrated look at library use over the course of a three-hour period on an "average" library day (i.e., not close enough to midterms or finals to skew the data). Each member of the team received a copy of the checklist and was trained to identify data points for recording. Spaces for study were then selected, resulting in the creation of nine teams of two or four members each (based on the size of the area under observation). Two floors were excluded from the study: the eighth floor (the library's administration area) and the fourth floor, which houses special collections and non-library offices. The first floor is a public, non-library space, and was also excluded from the study. This left a total of five floors to be divided among 18. Because the second floor is the most heavily trafficked area in the building, and has the highest concentration of seating areas in the building, two teams of two were assigned to two of the four zones on this floor, while two individual observers managed the remaining zones.

In collaboration with the library's marketing representative, the study was announced and promoted on social media, and a simultaneous, live-tweeting event was hosted on Library Snapshot Day to encourage additional feedback and increase awareness of library user needs among university administrators and influencers.

Despite the university's goal to serve each and every student, it is easy to overlook the role of place in student success. The constant struggle for seating, outlets, and elevators prompted one of our researchers to take action and reach out to the university president under the auspices of the

observational study. The president of the university hosts occasional Twitter chats to allow members of the community to voice concerns. He also has a quote posted on his office door (located in the library) that states, "Every student counts." Our researcher reminded him about the 8,000 students that visit the Green Library each day and asked, "What about them?" She also took the opportunity to report much-needed repairs, particularly to the building's ancient elevators and escalators. Ironically, on the day of the observational study, both escalators were out of service; soon after the Twitter exchange, they were repaired. Ultimately, the exchange revealed a need for greater advocacy on behalf of library patrons and the power of public forums to engage university administration.

In addition to the methods cited, feedback was also sought through the use of "pop-up" comment boards that were positioned near the elevators on each of the public floors, and collected via an electronic survey that was distributed online. Pictures were also recorded by members of the research team and saved to a shared drive; these were then combined and compared with recorded data to produce a "big picture" look at Library Snapshot Day. In total, the team recorded the aforementioned 4,100 observations and 280 comments (which were transcribed and coded electronically); in combination with systems data, the team was able to pinpoint the number of items checked out during the observation period, the number of devices on loan, and the number of library computers in use within the building.

Findings and Observations

Much of the data gathered during the study substantiated what we already knew about our users based on systems and circulation statistics. For example, the numbers confirmed that many students use electronic devices in the building, creating a greater need for upgraded electrical and Wi-Fi capabilities. However, the observations revealed additional insights that existing data could only hint at, particularly what students are doing in the building and how they are adapting spaces to their needs. Moreover, the study revealed resources that are not in use, at least not during the period observed. For instance, no students were observed using or browsing bound periodicals. However, because these items only circulate in-house, and browse data is not collected, the library has no current method for gathering data on periodical use. As a result, the possibility of a new method for managing these volumes is under consideration.

During the three-hour observation period, several behaviors were consistent on all floors, including conversation and quiet areas. Based on the researchers' notes, it is clear that students value their space. Once claimed, there is little turnover in seating or space use. For the most part, individuals and groups remained in a single location for the duration of the observation. Based on comments made by students, it can be assumed that users feel the need to remain in a chosen location for a sustained period of time in order to hold on to that space. The fact that the Green Library cannot sustain the number of students present is more than evident when reviewing the data and comments posted on the "pop-up" boards.

The items that students bring into the building also make it evident that they are prepared to stay for an extended period of time. During the snapshot period, many of the students observed had drinks and snacks beside them, while others were seen eating full meals, despite policies discouraging these kinds of foods. Ideally, the solution is to provide more and better seating, so that students have less trouble finding suitable spaces; however, this is unlikely to happen with the current budget and university policies. During the preliminary planning stage, the research team focused on enforcing rules regarding food in the building, but the study revealed that such thinking needs to change and a different approach taken to resolve the issue. No doubt, this will require collaboration with units outside the library, such as the facilities department, to find the means to maintain a clean and inviting atmosphere that is accommodating to students.

Another interesting observation was made on the upper floors, this time involving the choice of seating among students. In some areas, seating is provided at large tables that can accommodate up to eight people. However, it was noted that, unless a group was working on a project or similar, individuals chose to use these tables in order to spread out and sit at a distance from other students. As a result, these tables only served two or three students at most. This indicates that space is being wasted and fewer students served by these tables, and that new options need to be explored to better serve students through furniture design and placement.

Finally, a researcher on the third floor observed a clear distinction between traditional and nontraditional students and their choice of seating. On the west side of the floor, the researcher observed a higher concentration of traditional students, while those using the east side of the floor were largely nontraditional student groups. The reason for this division is unclear, but may indicate the need for further study to learn more about the difference between traditional and nontraditional students' study habits.

Limitations

Limitations in our primary method for data collection make it difficult to make precise conclusions regarding the number of students in a particular zone at a particular time. Similarly, it is difficult to infer the actual percentage of students using a particular space while performing a specific task based on the data collected. For a better comparison, the data should be processed in percentages based on individual zones first and further extrapolated to reach more insightful conclusions. Moreover, given inconsistencies in reporting by members of the research team (such as when a round or observation was started or made), the numbers merely provide a general snapshot, rather than a detailed report on library use. For example, the researcher monitoring Zone 4 of the second floor reported nearly the same number of observations as the researcher in Zone 3; however, the number of rounds conducted in each zone was not included. Similar differences in reporting can be assumed for each zone.

Inconsistencies were also revealed regarding the team's understanding of the factors listed on the observational checklist. The accuracy of the observations is dependent on each observer's interpretation of the checklist and the observations reported. Additional training can greatly improve these issues, as well as a revised strategy for recording and reporting data.

Moreover, because the study was conducted during a single, three-hour period, the researchers can only provide a glimpse at what students were doing and where they were sitting during that period. A longer study is necessary to reveal patterns over time.

Further Insights

In addition to staff and library faculty, one of the researchers serving on the team was a current MLIS student and member of the technical services department, as well as an FIU alum. The opportunity to participate in the observational study allowed this researcher to not only observe, assess, and synthesize data, but also develop new skills and become an integral part of an interdepartmental library research team. Participating in the study allowed the researcher to take lessons learned in the classroom one step further and put them into practice. As a student, the researcher was able to gain practical knowledge, and try her hand at the Institutional Review Board process. In addition, she learned how to serve as a co-investigator and conduct actual field research—both skills that are transferrable to the graduate thesis process and library profession.

The experience also exposed the researcher to professional development opportunities beyond those available to most students and library staff, including the opportunity to attend the ALA Annual Conference as a co-presenter. More importantly, the experience allowed her to feel like a true member of the institution and profession, both as a student and a minority.

Conclusion and Future of the Study

Observational studies are a low-key, easy-to-implement strategy for data on library user experience. However, by bringing together staff from various library departments, Library Snapshot Day not only provided insight on library users, it provided a sense of engagement for library staff and shed light on how they perceive their role within the library and the library experience.

The study was useful to the library as a whole as it provided fresh insight into space use and raised new questions for future studies. In addition, it provided additional information to augment a survey conducted during the spring 2016 semester by the Student Government Association, and which posed questions regarding students' library study habits and preferences. Armed with this information, we expect to create opportunities for future study and find ways to improve service. In the meantime, members of the team have taken the chance to share findings with other members of the library by participating in a post-ALA recap session, while those members of the committee participating in department chair committees and task forces frequently refer to the findings when relevant. Current projects include a new look at food policies

and the implementation of a new system for group study room reservations.

Endnotes

1. Mott Linn, "Seating Sweeps: An Innovative Research Method to Learn about How Our Patrons Use the Library," in ACRL 2013 Proceedings, April 10–13, Indianapolis, IN (Chicago, IL: Association of College & Research Libraries, 2013), 511–517, http://www.ala.org/acrl/sites/ala.org.acrl/files/content/conferences/confsandpreconfs/2013/papers/Linn_Seating.pdf.
2. Ibid.

APPENDIX A

Observational Checklist

Date/ Time: **Floor/ Zone:**	**Round 1/ TIME**									
	1	2	3	4	5	6	7	8	9	10
Person:										
Where is this person										
In a carrel										
In private/unobservable seat/space										
In a lounge chair										
At a public computer										
At a table										
Sitting on floor										
Walking										
In group study/media study										
In a research carrel										
At service point										
Other (Ex: Honors, GIS classroom etc.)										
Possessions:										
Printed material										
Writing material										
Electronics stuff										
(Laptops, iPad, etc.)										
Food										
Drink										
Unusual photoworthy stuff (Ex: Backpacks, cords, skateboards in aisles etc.)										
Activities:										
Reading										
Writing										
Using laptop, iPad etc.										
Using library computer										
Using an outlet										
Talking/listening										

Date/ Time: **Floor/ Zone:**	**Round 1/ TIME**									
	1	2	3	4	5	6	7	8	9	10
Using cellphone										
Using whiteboards										
Drinking something										
Eating something										
Sleeping										
Searching for library materials										
Searching for a seat										
Using copier										
Using BookEye scanner										
Attending function (class, program etc.)										
Other (Ex: Using digital signs etc.)										

APPENDIX B

Additional Reading

Bedwell, Linda and Caitlin S. Banks. "Seeing Through the Eyes of Students: Participant Observation in an Academic Library." *Partnership: The Canadian Journal of Library and Information Practice and Research* 8, no. 1 (June 19, 2013). doi:10.21083/partnership.v8i1.2502.

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Advancing Campus Priorities through Informed Space Allocations

Robert E. Fox, Jr. and Bruce L. Keisling
University of Louisville, USA

Introduction

How do we allocate library spaces as user needs and institutional priorities shift? Is it based on the squeaky wheel method or can assessment lead us to shape an informed approach?

This paper shows how one library addressed the issue by crafting a progressively comprehensive assessment program with each step building on previous findings and with data from the program used to strategically reallocate library spaces. What began as a longitudinal set of campus-wide surveys led to a six-month multi-methods study into renovating, repurposing, and strategically reallocating space on the library's first floor. While that renovation was still underway, planning began for the current project which is employing data to take a floor largely dedicated to print collections and thoughtfully carve out space for two university-wide strategic priorities: creating new student learning spaces and developing a faculty technology innovation lab. Data elements being utilized include: collection overlap analysis, current and potential deaccession rates, impact of potential additional back file purchases, item-level transactions, and availability of storage space. In addition to seeking a balance between competing uses of floor space, library leaders are seeking to optimize the human and financial resources being deployed to successfully complete the project. The faculty technology innovation lab is being developed with a campus partner so the library also had to factor in consideration for that partner's time schedule and financial contributions to the project.

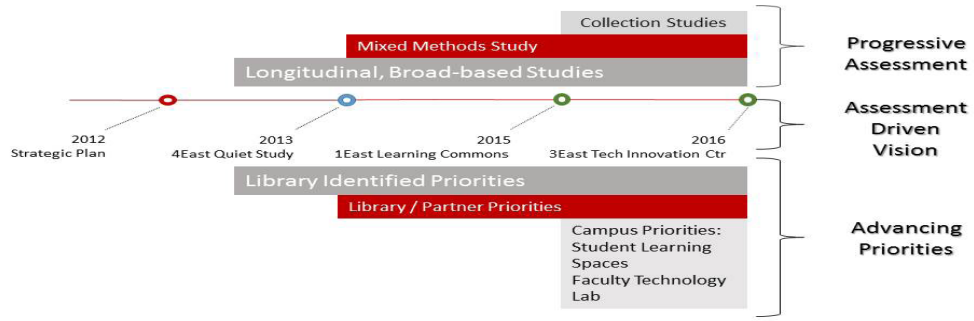
The paper demonstrates how a series of assessment projects can successfully build on each other and how data can be used to advance key library and campus space priorities not only for this library, but also with methods and results generalizable to other libraries.

The strategic plan for the University of Louisville libraries states that "Our knowledge about users comes from reliable, relevant data related to their preferences, activities and needs, and this knowledge drives future changes." This quote notes how our libraries will use data from and about our users to help meet their needs.

In addition to the strategic plan anticipating the use of data to drive changes, we said in a vision statement that we wanted to deploy assessment data to move forward with strategic opportunities. While we have used data to move forward with a number of areas in our strategic plan, for this paper, we are focusing on how we used data to inform space allocations in our library that also advanced key campus initiatives.

The aforementioned strategic plan went into effect in 2012 and is the first item noted on the timeline of activities featured in Figure 1. Under the new strategic plan, the first renovation and reallocation of space using assessment data was a renovation to create a quiet study floor. This paper, though, focuses on two subsequent space reallocations: one completed in 2015 and one from 2016. On the timeline, we note how we have employed a series of progressive assessments moving from very broad campus-wide surveys to specific collection analysis techniques. We also note how the priorities advanced by the projects went from being library-specific to those addressing more campus-wide issues.

Figure 1

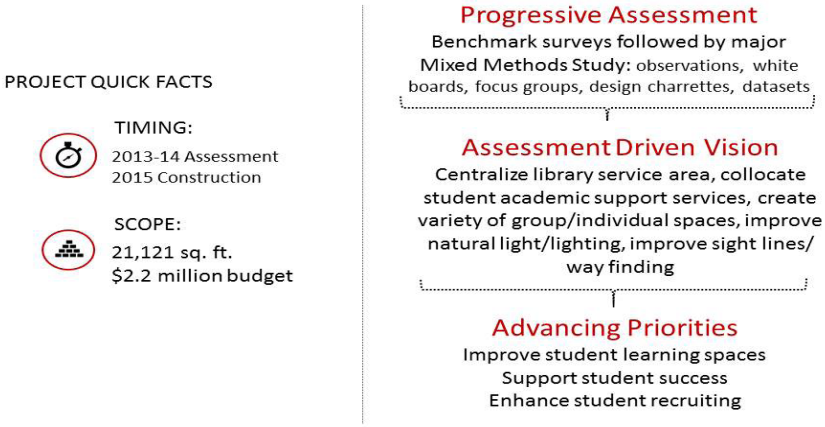


1E Learning Commons Project

The first project that we address is the renovation of the first floor commons in the older east side of the building. The assessment portion of the project ran from 2013 to 2014. Preliminary information came from the 2012 and 2014 campus-wide surveys that we conduct every two years. This was followed by a mixed-methods study targeting the space that included observations, focus groups, white boards, design charettes, and an analysis of transactional data from the service desks in that space.

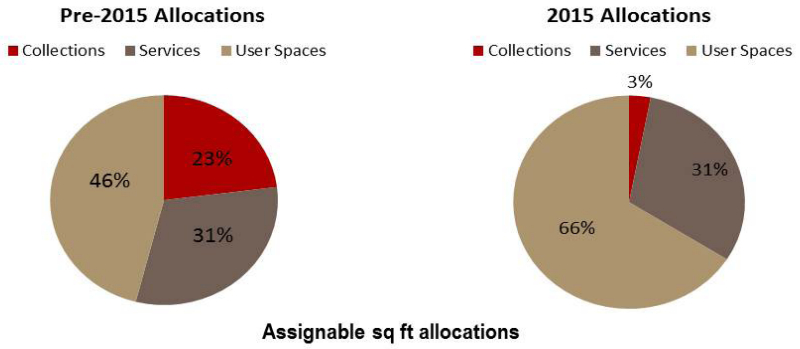
Construction took place in 2015. Based on our analysis of the assessment data, student needs that were addressed by the project included centralizing service at one desk, co-locating several academic support services to increase both their visibility and their ability to more closely align their programs, increasing seating by nearly 250 in individual and collaborative spaces, and improving natural lighting and wayfinding. What at first started as a library project to improve seating and services ended up gaining campus attention for advancing student success and recruiting initiatives. An overview of the project is included as Figure 2.

Figure 2



In addition to the project accomplishments noted above, another outcome was the significant reallocation of space on the first floor. Figure 3 details how the project increased user spaces by reducing the collections footprint.

Figure 3



Technology Innovation Center and Improved Student Spaces Projects

A second project that is being executed in two separate phases also demonstrates the progressive impact of assessment and the advancement of campus priorities. Both phases of this project are reallocating space on Ekstrom Library's third floor.

Phase one of the project reassigned and renovated an estimated 10,000 square feet of the third floor from print journal shelving to a new faculty technology innovation center. The total cost for phase one, which was completed summer 2016, was $2.5 million.

Phase two, scheduled for 2018, will repurpose approximately 25,000 square feet of space that is currently print monograph shelving and redundant office space. The projected cost for this phase is $3.5 million.

The origins of this project began with benchmark user surveys already described as part of the first floor renovations. The surveys indicated that students wanted and needed more learning/study spaces. The assessment techniques broadened to include collection usage and overlap studies.

For some time, library leadership hoped to repurpose a large portion of the third floor for student learning spaces, but recognized that underutilized print collections needed to be downsized in that area. As leadership reviewed options for downsizing and storing collections, the parallel space needs of a campus partner (with funding) offered an opportunity to link needs. The campus partner had a mandate from senior university leadership to develop a faculty innovation center. We saw that we could advance campus priorities for student and faculty learning spaces through this reallocation.

What was clear from the benchmark surveys (2012, 2014, and 2016) was that the library needed more learning space for students. To do that, it was also clear that something had to be done with the extensive print collections on the third floor. But it was not clear what we should do with the print collections and how we could fund options for collections and renovations.

We knew that we needed space for student learning, but could that space come from an addition to the building or through repurposing existing space? The answer to that question was fairly obvious. There was no funding for or land on which to build so we had to reallocate how we used existing space. But it was still not obvious how we could fund any initiative.

In looking at options to clear space, one immediate option was to review print journals for deaccessioning. Ekstrom Library had never systematically weeded print journals even when there was reliable online access. Utilization reports affirmed that was an obvious way to make space. It was also clear that deaccessioning alone would not clear enough space to meet the need and opportunity. We also needed to purchase more journal back files and expand higher density storage. (Ekstrom Library has a high-density automated storage facility that was designed with a capacity for 1.2 million volumes, but only installed with equipment to accommodate 600K volumes. Building

out storage for an additional 600K volumes was possible but would still require substantial funding.)

We also had to identify the potential funding streams. The primary options were central campus funding or other campus partners. (Development staff had worked for years to solicit external funds and this kind of project had little donor appeal.) Given the budget climate, there were limited funds available from the central campus administration. While they had a high level of interest in moving forward on these priorities, they had little funding available. Through this period of assessment, a campus partner (and current building partner) emerged who had funds, who needed space, and who had a mandate to advance faculty learning and innovation space. After review, it not only became clear that this partnership could provide funds to advance library priorities but also clear that the library could assist in advancing other campus priorities. The library would allocate some space to the faculty technology innovation center but gain a greater share of space for student use.

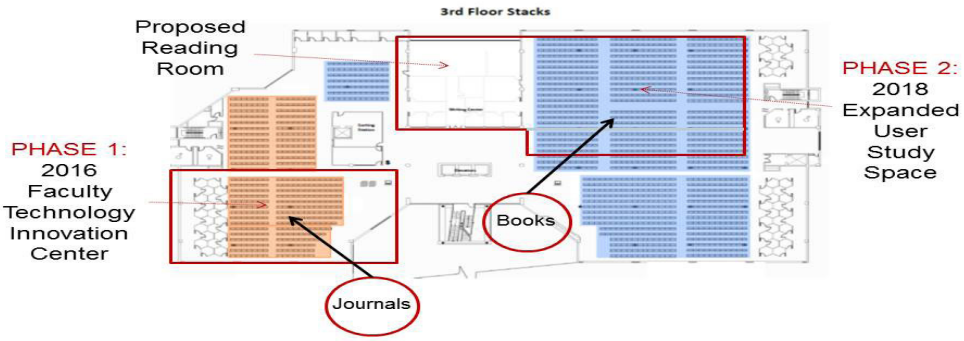
By merging our original priority for expanded student learning spaces with the campus/partner priority for new faculty innovation space, the library would have access to funding from the partner. The decision to partner provided financial assistance for purchasing back files and expanding the high-density storage. It would also position the library as a leader in addressing campus priorities for students and faculty.

The floor plan (Figure 4) for Ekstrom's third floor shows the space prior to the summer of 2016 with the project phases, the kinds of materials in the zones, and the areas to be repurposed for faculty and staff learning zones. A large segment of print journals was relocated to provide space for the faculty technology innovation center. The phase one project area was cleared of journal content in early 2016 and the new faculty technology innovation center was completed during the summer of 2016.

Phase two will provide the student learning space and is targeted for 2018. That space currently has a substantial number of monographs and some office space that has been unoccupied since 2015.

Assessment for this whole project fairly quickly became focused on a range of collection measures. In parallel with the decisions to work with a campus partner for funding, to reallocate space, and to develop the space in two phases, we needed to know where on the third floor we could locate the partner's project. A first level of analysis was to review the scope of the content on the floor and to assess the relative rates for deaccessioning and/or moving to storage.

Figure 4



Limited weeding was taking place in government documents, the print book collection, and the high-density storage area, but it was not fast enough to accomplish the clearing needed for phase one. We had some recent data on deaccession rates and calculated how long it would take to clear enough space for phase one. It became clear that, to meet the timeline for the partner, we had to focus on weeding print journals. We found that we could weed 85K print journal volumes in 120 days versus 15K monographs in one year (assuming current rates for each type).

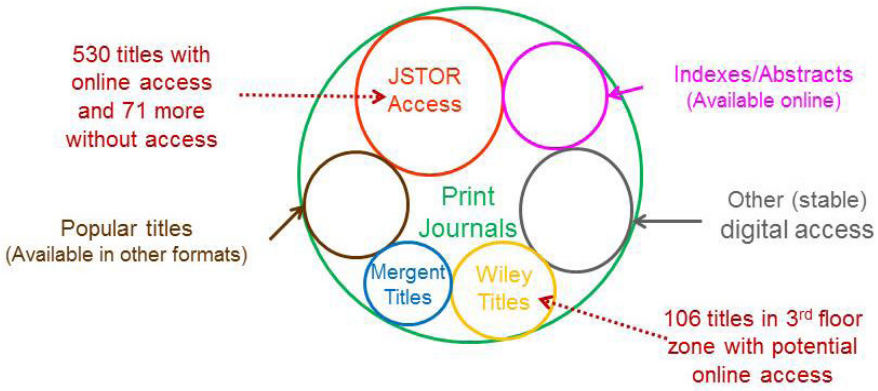
We identified that the first phase of weeding would need to be the print journals. We began an analysis of what we had on the shelves, what we had online with perpetual access, and what we could quickly move to storage.

Ekstrom Library had not previously weeded any bound journals—even those for which we had JSTOR back file access. We learned that we had 530 print titles with current JSTOR back file access that could easily be withdrawn. We were also comfortable withdrawing print indexes and abstracts.

We also knew that we had items in print for which we could purchase online back files and then withdraw the print (Figure 5). We found 71 titles that were available in JSTOR for which we did not have perpetual access rights. With the dean's support, to allow weeding, we purchased those titles as well as 106 additional Wiley back file titles. We also purchased ongoing access to a range of Mergent business titles. For the Wiley titles we also assessed the cost of the back file titles per linear inches per title to maximize the linear feet we could clear.

Even with the quantitative data gathered to inform deaccessioning the print journals, an additional layer of qualitative data was reviewed before we discarded the print holdings. The primary categories of qualitative data that we reviewed were availability, use, condition, and special features. Availability: e.g., were all associated titles available in JSTOR? Use: for some print titles, there were known patterns of use by particular faculty and courses that warranted retaining the print. Condition and/or special features: were there mitigating factors for some titles that warranted retention or discarding—e.g., a complete run of *Punch* in excellent condition?

Figure 5



What actions did we take as a result of our analysis and the data we gathered?

We made major decisions about space allocations. The new faculty technology innovation center is now located where a portion of our print journals were a year ago. We decided to move forward with this partnership and to reallocate this space based on a data assessment.

We purchased additional JSTOR, Wiley, and Mergent back files. These decisions were made based on usage data, budget information, costs per linear inch/feet, and online availability.

We withdrew 50K bound journal volumes and shifted/stored another large number. These decisions were made on the basis of strong quantitative and qualitative data. We also initiated planning for and committed to expanding our high-density storage capacity. Finally, we had conversations with faculty about journal retention and which monographs to relocate to high-density storage.

Conclusion

This paper sought to demonstrate how a series of progressive assessment projects can successfully build on each other and be used to advance key library and campus space priorities. The University Libraries' commitment to assessment revealed the need for major improvements and reallocation of space on Ekstrom Library's main floor. Through that project, the library positioned itself to meet the campus priority of improved student learning spaces. That increased campus profile and additional assessment work led to an additional two-phased project expanding the library's role in meeting student and faculty learning space needs. Phase one of that project was completed in 2016 and phase two is scheduled for 2018. Through assessment and reallocation of space, Ekstrom Library has an expanded role in supporting and advancing campus priorities.