Assessing Argument, Critical Thinking and Information Literacy Learning Outcomes

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Research questions

• How effective is the Toulmin method in the evaluation of sources for their accuracy, credibility, reliability, and bias?

• How effective are the critical thinking and argument analysis elements in the experimental information literacy session in developing students argument and critical thinking skills?

• Can they be adopted in different information literacy instructional settings?
Evaluation of sources using critical thinking and argument analysis

Project background

Originated as 2013-2014 ACRL Assessment in Action project at Saint Mary’s College of California

<table>
<thead>
<tr>
<th>Saint Mary’s College of California</th>
<th>California State Univ., East Bay</th>
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<tbody>
<tr>
<td>Library instruction in “Argument and Research” course (3 sections)</td>
<td>Hybrid two-unit Information literacy course</td>
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<tr>
<td>Project SAILS</td>
<td>Instruction in “Argument and research using Toulmin and images</td>
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<tr>
<td>Experimental instruction with “Flipped” teaching</td>
<td>Pre/Post tests</td>
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<tr>
<td>Pre-session materials, in-class exercise, assignment, and research paper</td>
<td>“Flipped” teaching</td>
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<td>Pre-session materials, in-class exercise, assignment, and research paper</td>
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## Student population comparison

<table>
<thead>
<tr>
<th>Saint Mary’s College of California</th>
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<tbody>
<tr>
<td>Female: 59%; Male: 41%</td>
</tr>
<tr>
<td>White: 43%, Latino: 25%, Asian: 14%, African-American/Black: 2%</td>
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<tr>
<td>87% freshmen from California</td>
</tr>
<tr>
<td>99% of freshmen living on campus</td>
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<tr>
<td>Tuition and fees: $39,890</td>
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<tr>
<td>% of full-time undergraduate receiving financial aid: 86%</td>
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<table>
<thead>
<tr>
<th>CSU, East Bay (undergrads)</th>
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<tbody>
<tr>
<td>Female: 61%; Male: 39%</td>
</tr>
<tr>
<td>African American: 11%; American Indian/Alaskan Native: 0.2%; Asian/Pacific Islander: 25.6%; Hispanic: 25.6%; White: 20.3%; Multiple/other/unknown: 10.5%; International: 6.8%</td>
</tr>
<tr>
<td>full time: 10,505/part-time: 1,555/</td>
</tr>
<tr>
<td>most students live off campus</td>
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<tr>
<td>Tuition: $6,549</td>
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<tr>
<td>Receiving financial aid: 74%</td>
</tr>
</tbody>
</table>
Saint Mary’s College of California Composition program

- Develop search strategies and use library catalogs and databases to find relevant materials for research
- Practice evaluating sources critically
- Seek and identify confirming and opposing evidence relevant to own hypothesis
- Evaluate and synthesize evidence for the purpose of drawing valid conclusions
- Demonstrate academic honesty and safeguard the intellectual property of others by properly integrating and citing sources
Sources used in research papers
Paraphrasing vs. Quoting

EXP

62.66% (IQA 50.26%)

37.34%

TRAD

56.60% (IQA 45.56%)

43.40%
Learning outcomes

![Learning outcomes graph showing comparison between TRAD and EXP across different categories: IERP4, IERP3, CT2a, IERP2, IERP1. The graph displays scores ranging from 2.3 to 2.86.]
Student reflection on research process

- “The research portion is the hardest part & once that aspect is out of the way the paper comes easy.”
- “I learned that you can't just type in every little word into every database, like you can with Google.”
- “Using library databases was more useful than Google if I want to find credible sources.”
- “I searched for the information the same way I learned last semester (in the library).”
- “Nothing new, I used the same techniques as I've always done.”
The CSU East Bay Experiment:

- At CSU East Bay: Toulmin flipped classroom used with images in of the 2-unit quarter length (10 week) information literacy course required of Freshman, LIBY 1210.

- **Learning outcomes:**
  - Determine the Extent of Information Needed
  - Access the Needed Information
  - Evaluate Information and Its Sources Critically
  - Use Information Effectively to Accomplish a Specific Purpose
  - Access and Use Information Ethically and Legally and Understands that there are Ethical, Legal, and Socio-Economic Issues surrounding Information and Information Technology.
Project Design & Timeline

• The pilot study began in one section of LIBY 1210 in Winter Quarter of 2013; of 30 students over half signed consent to use their work in the study; then continued with two sections of LIBY 1210 in the spring of 2014, of 60 students, 50 students signed the consent form.

• Research questions and experimental instruction started out the same as Saint Mary’s College; additional elements were added to the experimental instruction by Spring of 2014 and additional research questions asked.
Rationale for including images:

### Use of Images in Social Media

#### The Landscape of Social Media Users

<table>
<thead>
<tr>
<th>Use Any Social Networking Site</th>
<th>% of internet users who:</th>
<th>The service is especially appealing to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Facebook</td>
<td>67%</td>
<td>Adults ages 18-29, women</td>
</tr>
<tr>
<td>Use Twitter</td>
<td>16</td>
<td>Women, adults ages 18-29</td>
</tr>
<tr>
<td>Use Pinterest</td>
<td>15</td>
<td>Adults ages 18-29, African-Americans, urban residents</td>
</tr>
<tr>
<td>Use Instagram</td>
<td>13</td>
<td>Women, adults under 50, whites, those with some college education</td>
</tr>
<tr>
<td>Use Tumblr</td>
<td>6</td>
<td>Adults ages 18-29</td>
</tr>
</tbody>
</table>

Source: Pew Research Center’s Internet & American Life Project Post-Election Survey, November 14 – December 09, 2012. N=1,802 internet users. Interviews were conducted in English and Spanish and on landline and cell phones. Margin of error is +/- 2.6 percentage points for results based on internet users. Facebook figures are based on Pew Research Center’s Internet & American Life Project Omnibus Survey, December 13-16, 2012. Margin of error for Facebook data is +/- 2.9 percentage points for results based on internet users (n=860).
Instructional Materials

- The following materials were used:
  - (same as SMC’s)
    - Topic development worksheet
    - PowerPoint on Toulmin method of analyzing arguments with applications to evaluation of sources.
    - In class group work on analyzing an argument article using Toulmin
    - Homework assignment: finding two articles with different perspectives on student’s topic.
Design of Image-Based Instruction

- In addition to the Toulmin-based instruction already described, the following four image-based instruction units were added on:
  - Photojournalism
  - Advertising
  - Infographics
  - Political Cartoons

- For more info go to: http://imagininginformationliteracy.wordpress.com/

- These included group work and homework (research log) relating to the students research paper topic
Analysis

- To understand the effect of this instruction on students' knowledge and skills in information literacy, building a strong argument and avoiding “Myside” bias, the following were collected and will be analyzed:
  - Pre/post test scores on a multiple choice information literacy test (used by the department)
  - All worksheets associated with the experimental instruction (homework and in class group work)
  - Argument/Research essays with annotated bibliographies
  - Reflective question responses
Section 1 Pre/Post test Scores
Section 2 Pre/Post Test Scores
Future Research Questions

- Comparison study between using Toulmin with and without the image component
- Comparing the instruction design using Toulmin to the newer Walton method which emphasizes teaching argument as dialogue
- Discovering if the use of images has an effect on motivation or level of engagement
- Exploring potential correlations between preference for visual learning and/or spatial ability and performance using image-based instruction