A Research Database as a Textbook Alternative: Comparing Student Outcomes in Freshman Science Classes

Mary Ann Cullen, Associate Department Head • Georgia State University Library
Dion C. Stewart & C. Bayard Stringer • Georgia State University, Perimeter College

Background
Geology and Astronomy instructors sought textbook alternatives
Motives for shifting from textbooks:
- Traditional texts cost $142 – $170
- Students weren’t reading textbook
- Introductory level OER texts unavailable for these subjects

Librarian role:
- Advocate for database subscription
- Assist with grant-writing and presentations
- Teach students/faculty to use database and create proxied links
- Communicate with fellow librarians about the project
- Offer OER expertise

Proposed Solution:
Integrate selected readings from a reference database (AccessScience)

Rationale:
- Encyclopedia-style articles and multimedia assume no prior knowledge
- Using one database simplifies searching for instructor and students

Research Objectives
Compare Student Learning and Engagement for Database vs. Textbook

Experimental Design
Geology: One class read textbook only and one class read database only.
Astronomy: Four classes alternated weeks of textbook and database readings.

Results
Student Learning (as measured by quiz performance):
- One question on each weekly quiz on content exclusive to readings.
- Percentage correct responses (Astronomy) Database 77% vs. Textbook 78%
  No significant difference in Quiz Performance in either class.

Student Engagement (as measured by an anonymous survey)*:

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Database</th>
<th>Textbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did readings improve understanding of concepts in lecture?</td>
<td>Yes</td>
<td>69%</td>
</tr>
<tr>
<td>Did readings improve performance on quizzes and exams?</td>
<td>Very</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>Somewhat</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>Like/No</td>
<td>5%</td>
</tr>
<tr>
<td>How do you use the database most often?</td>
<td>On my own to research class concepts</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>As assigned</td>
<td>53%</td>
</tr>
<tr>
<td></td>
<td>Only before a test</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>5%</td>
</tr>
</tbody>
</table>

*mid-semester survey in Geology classes

Conclusions
- Database and textbooks equally effective in student quiz performance.
- Geology students reported the database was more helpful in learning concepts and improving performance.

Additional Database Benefits
- Cost savings to students
- Students became acquainted with library database as a reliable information source.

Challenges & Considerations
- Significant instructor time to select database readings
- Many database readings were too advanced in concepts/scholarly language for freshmen

Contacts
Mary Ann Cullen (Librarian) mculen@gsu.edu
Dion C. Stewart (Geology) dstewart29@gsu.edu
C. Bayard Stringer (Astronomy) caspringer@gsu.edu

Poster Presentation at COMO 2016, Athens, Georgia by Mary Ann Cullen, mculen@gsu.edu