Learning to Evaluate Sources: Comparing Teaching Modalities and Student Outcomes

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abstract: While educators and librarians have long been concerned with developing undergraduates’ ability to find credible sources, the abundance of unreliable information online has exponentially complicated the situation. In developing a new curriculum for English Composition 1001 classes, a first-year writing class at the University of Cincinnati, we developed new ways of engaging with student experiences before and beyond the class sessions to address source analysis through active peer learning. Using an action research framework to position ourselves as both practitioners and researchers, we considered our own practice as teachers as much as student outcomes. We compared the use of flipped content with in-class instruction. By capturing students’ research process through pre-class and post-class surveys, we could better understand the online ecosystem they must navigate and help them reflect critically on their progress. Our analysis of student survey responses allowed us to measure progress in three areas: source quality, search strategy, and topic relevance. Flipped class activities had the same result on student behavior as did in-class delivery.

Introduction

In November of 2016, the Stanford History Education Group, a research and development team based in the Stanford University Graduate School of Education in Stanford, California, released an executive summary, “Evaluating Information: The Cornerstone of Civic Reasoning.” It discussed the group’s research on students’ ability to evaluate the credibility of online content. At the undergraduate level, they found, students struggled to evaluate websites and to identify the difference between a mainstream source and a fringe one. “Overall,” they concluded, “young people’s ability
to reason about the information on the Internet can be summed up in one word: bleak.”

As instruction librarians working with undergraduates to develop information literacy and research skills, we were not surprised by the Stanford findings. However, we saw them as a call to action and an opportunity to reassess our instruction methods to better engage undergraduates at the University of Cincinnati in critically evaluating online sources.

In December 2016, a small group met to consider how we might address head-on our students’ ability to assess online information. What followed was a process of curriculum redesign, partnership development, and deep consideration of our own teaching practices. Our goal was to study the process of developing a new library instruction curriculum using flipped content, where students review new material at home and use class time for projects and discussions, and to measure its impact on students. We investigated what impact our teaching—online tutorials and face-to-face instruction—had on the quality of sources students chose in introductory English composition classes.

This article presents the process by which we developed a new curriculum to address critical skills in source evaluation. We will show the iterative process of developing instruction sessions as well as the impact of the curriculum. In designing our assessments, we considered both effectiveness and immediate benefit to our students. For us, perhaps the biggest innovation was in asking for the actual URLs of sources the students found in their early research. By prompting students to share their search process, we could better understand the online ecosystem they must navigate and help them reflect critically on their progress.

Background

Undergraduate Source Evaluation

While educators and librarians have long been concerned with developing undergraduates’ ability to find credible sources, the abundance of unreliable information online has exponentially complicated the process. Simply pointing students to library-approved resources is not enough. We need to help students develop the ability to evaluate information on the open Web, both as a professional competency and as a tool of citizenship.

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igate the online environment without the necessary skills to digest information critically. Eszter Hargittai, Lindsay Fullerton, Ericka Menchen-Trevino, and Kristin Thomas found that “students are not always turning to the most relevant cues to determine the credibility of online content. Accordingly, initiatives that help educate people in this domain—whether in formal or informal settings—could play an important role in achieving an informed internet citizenry.” In other words, while pointing students to library resources can have a deep impact, they also need help evaluating the vast array of sources they discover and use independently. As S. Shyam Sundar reported,

While an assessment of . . . simple cues was feasible in traditional media, it is next to impossible for an average internet user to have a well-defined sense of the credibility of various sources and message categories on the web because of the multiplicity of sources embedded in the numerous layers of online dissemination of content. Hargittai’s findings suggest that “students rely greatly on search engine brands to guide them to what they then perceive as credible material simply due to the fact that the destination page rose to the top of the results listings of their preferred search engine.”

In a world where the New York Times can appear in search results no different from the far-right Breitbart News Network or the environmentalist Eco News Network, students must find other cues for evaluation. Most often, they choose to rely on how high in their Google search results a source appears.

Beyond relying on the order of search results, students use other, equally unreliable indicators. A review by Miriam Metzger concluded that “design/ presentational elements appear to be the primary factor in users’ credibility and information-quality assessments.” Sam Wineburg and Sarah McGrew, researchers of the Stanford study, found that over 50 percent of the students in their study evaluated the website of a socially conservative advocacy organization, the American College of Pediatricians, as more reliable than that of the American Academy of Pediatrics (AAP), the leading professional association of pediatricians. In addition, “Those preferring the AAP saw the two organizations as equivalent and focused their evaluations on surface features of the website.” Therefore, we cannot assume that teaching students to differentiate journalism and academic research sufficiently addresses the vast variety of sources available online. Credibility can only be determined through research and critical analysis. However, as the Stanford study indicated, the research and analysis needed to determine trustworthiness for most sources is within reach for most people. For instance, background information on authors or publication sites can be found using simple online searches. Analyzing the way a given source presents information is more complex, however. Wineburg and McGrew suggest using the three key steps of fact checkers: Google an unfamiliar site, scrutinize the site’s “About” information, and look beyond the first results. Yet most students do not intuitively consider these steps and therefore skip them altogether.
Flipped Content for Active Learning

We identified flipped content as the best way to reinforce lessons of source analysis for our undergraduate population. Our previous experience showed us that a flipped classroom could effectively extend our interactions with students, thanks to the generally receptive attitudes of the instructors. However, this decision was not without its challenges. According to Sara Arnold-Garza, assigning this kind of content “require[s] early coordination with the teaching faculty member to provide the assignment to students. Further, even if assigned, students may not actually do the pre-assignment if no grade is given.”

We knew, therefore, that we would have to enhance our existing relationships with instructors to make sure our content was used. Detailed instructions would also be important since “only 2% (of libraries surveyed) clearly instruct users to watch instructional videos before attending a library research workshop,” according to Alexandra Obradovich, Robin Canuel, and Eamon Duffy. The three examined the practice of flipped content pedagogy across 140 libraries in the Association of Research Libraries in Canada and the United States.

Finally, we would need to be strategic about how we integrated the flipped content in the classroom. To understand this, we turned to research by Michael Goates, Gregory Nelson, and Megan Frost on the impact of flipped work on students’ search strategies. They concluded that “while online tutorials are in many ways convenient for both instructors and students, these tools still cannot entirely replace the influence of face-to-face human interaction.” Ultimately, we decided that, even where online learning tools delivered content, class time would need to reinforce these concepts. We adopted this approach both in terms of source analysis and library research strategies.

Research Setting

Composition 1001 Courses

Like many academic libraries, our strongest point of contact with undergraduates results from our introductory instruction sessions, especially for the English Composition Department. University of Cincinnati Libraries has a strong collaborative relationship with this department, cultivated over many years. The 1001 introductory courses are taught by a mix of instructors: regular faculty, adjunct faculty, and graduate teaching assistants (GTAs), with the largest portion taught by graduate students, followed by adjuncts. Each fall, the library liaison meets with new GTAs to discuss the libraries’ role with the composition classes, expectations for flipped content, and the library research session. This meeting set the stage for buy-in.

Most instructors schedule single class library sessions, or “one-shots.” Historically, these include a brief lecture and a demonstration with directed practice using one or two general library databases. During the last third of the session, students have time to explore with one-on-one assistance from the librarian. Over a typical fall term, more than 50 sessions are offered, reaching over 1,000 students. Given the long history between the library and the department, we identified instructors at all levels as key allies in developing and assessing our new curriculum.
In creating flipped content, we built on our experience with library-assigned prework for students before the one-shot instruction session. We introduced flipped activities in 2013 for the Composition 1001 classes, after years of noticing that students frequently arrived unprepared for the library session with no topic in mind. Consequently, during the lab portion, students spent their time Googling to find a topic instead of using a library database to explore the subject and improve their search skills. The previous flipped content included three components: two videos and a short activity where students were asked to complete a concept map, a graphic organizer that begins with a main idea (or concept) and then branches out to show how that main idea can be broken down into specific topics. Interestingly, when we introduced the new flipped content for this study, many of the composition instructors continued using the previous flipped content as an additional activity. A new GTA even found this material on the course library guide and assigned it to her class.

Research Question

Can librarians make an impact on student research skills? At its heart, our curriculum redesign was an attempt to shift our instructional focus to a more targeted goal, imparting a single skill: source analysis. Throughout this process, we have considered our own practice as teachers as much as the student outcomes we measured. Broadly, we wanted to know: To what extent does the flipped content created for this course result in equivalent learning outcomes compared with in-class instruction? By measuring students’ ability to identify credible sources, we explicitly measured our own success as instructors in informing their decisions.

Method

In undertaking this study, we were interested both in the impact we might make on students as well as in our own development as teachers. Using an action research framework, a reflective process of progressive problem-solving working in a team, we positioned ourselves as both practitioners and researchers. Throughout this study, we took careful stock of how we came to our decisions and directions. What follows is our process, from development and initial deployment to reflection and assessment of new directions.

Pilot

In 2016, the tumultuous presidential election coincided with our fall semester. We thought seriously about our role as professionals in guiding the development of our students’ information literacy beyond the university setting. The authors, along with our colleague the coordinator of instruction, sat down that December to outline what we imagined might be a more effective approach.
Figure 1 shows the whiteboard where we captured our initial thoughts. The seeds of our final product are all present, though we had no idea at the time what the concept map would look like. We identified three skills, which drove our mapping of learning outcomes:

- Develop comfort beyond Google;
- Identify search terms; and
- Find evidence from experts.

We set out to retain the best features of our existing approach while pushing ourselves to explore innovative and unexpected solutions. For instance, we wanted to take advantage of previous successes in using flipped content but push the technique further in terms of engagement. Having students send in URLs was our eureka moment, though it required extensive problem-solving work. Specifically, we had to figure out how we would handle the volume of responses if we used the survey with all classes. Because we would do extensive assessment for this research, we brought in a graduate student already working in the libraries, who is also an author of this paper.

Midway through the spring semester of 2017, we felt ready to try assessing students’ URL submissions. Partnering with a faculty member, we conducted a field test with two course sections. We had the professor send out a survey link asking students for two responses:
1. What is your research topic?
2. Copy and paste the Web address of one source that you have found that relates to your topic.

The simplicity of this initial survey reflected discussions we had with the faculty member after we approached her with our ideas. Having worked with teaching librarians for many years, she was open to new approaches and trusted our expertise. From the URLs her class submitted, we chose six examples of sources to use in the class session.

We kicked off the instruction session with small groups peer-reviewing one of the six submitted sources. They responded thoughtfully and had productive group discussions. Ultimately, the pilot showed us that we were on the right track in terms of engaging students with analyzing online sources. However, this discussion activity took up more class time than our previous iterations. Furthermore, since the pilot classes had a duration of 75 minutes, we had to lean hard on our flipped content when we approached 55-minute sessions. This led to our decision to offer additional materials only to the shorter courses. Longer classes would serve as our control group, and we would present the same concepts in the flipped content as in our face-to-face instruction session. Consequently, we could measure the relative effectiveness of our flipped activities.

**Flipped Content**

What, we asked ourselves, was the most essential information students needed from a library session? As librarians addressing a class who may have little idea what information resources a university can provide, we often have a lengthy list of important points to cover while still making time for active learning and independent searching. In the end, we determined there were two lessons we needed to deliver through flipped content:

1. An introduction to the unique process of academic research, and
2. Knowing what questions to ask about online sources.

To achieve this, we created an expansive and thorough e-learning module focusing on the research process plus a targeted short video introducing concepts of source analysis.

The e-learning module took several months to develop. It was modeled on a choose-your-own-adventure game and emphasized interaction as much as content. Students could choose a topic at the start of the game based on their interests. We developed the topics with librarian colleagues at other campus locations to reflect both student interests and sound topic development.

The source analysis video took only a few weeks of work. Using a light board, two librarians conversed informally, bantering back and forth. This technology allowed us to physically interact with different parts of selected online sources. We received significant positive feedback on this video from both instructors and students.

**Procedure**

Starting that fall, we implemented a standard procedure for deploying our pre-class work. Once the library session was scheduled, we sent the instructor an e-mail describing what the students were expected to complete before class. The shorter, 55-minute classes received details outlining the flipped content in a linear, three-step process: a
link to our Library Guide page with the interactive tutorial, the source analysis video, and a survey. The instructions asked students to complete the tutorial and video and then submit one source via the online survey. In practice, most instructors sent a copy of these instructions to their students. Others, particularly the younger graduate assistants, went through the tutorial and watched the video in class with their students. Though technical limitations prevented us from tracking whether students completed the instructional content before taking the survey, we felt confident that course sections with higher rates of survey completion had likely completed the preceding activities. This assumption was generally confirmed during informal discussions before class and around the activities. This informal data gathering indicated that completion rates for the video were higher than those for the tutorial, which was significantly longer.

The longer, 75-minute classes, serving as the control group, received only a link to the survey, forwarded to students by their instructors. Librarians presented additional concepts through an in-class presentation. We could then measure the impact of the assigned prework by assessing the source quality, search strategy, and relevancy of sources to the students’ research idea and comparing the two groups. Following the library session, we sent another e-mail with a link to the post-class survey.

The pre-class survey asked the students to prepare by finding relevant and credible sources. We stated that acceptable sources come from many different places and that, as part of the library session, group time would be allocated to evaluating these sources. The survey asked the students to:

1. Identify a research idea,
2. Copy and paste a Web address,
3. Explain how the source was found, and
4. Share a brief explanation of how the source relates to the research idea.

After we received the survey responses, our graduate assistant organized the responses by recording source metadata, such as source name, author, format (for example, blog, news or scholarly article, or commercial site), and references. She sent the librarian a spreadsheet of the student-submitted information for each session. The librarian chose four to five different sources to examine in class. We selected sources representing a range of possibilities, such as scholarly articles, news sources, and personal websites.

As in the pilot, we kicked off the instruction session with a peer-learning activity on source analysis. Small groups were assigned one source to analyze according to the provided prompts (see Appendix A). Students captured their findings on whiteboards. After a 5- to 10-minute breakout session, each group reported its findings. The librarian then asked if the students would cite this source in their final assignment. The librarian concluded by providing her own analysis of the site and invited the course instructor to comment. This process took approximately 20 to 30 minutes of class time.

After the activity, a two-sided handout was distributed (see Appendix B). The front side featured “Research Hacks,” including tips on searching and source analysis. The longer classes received the concepts covered in the flipped content. The remainder of the class provided a brief introduction to a general database followed by a lab session. The backside of the handout enhanced the lab session, prompting students to reflect on their search process.
To measure students’ progress, we reached out to the instructors with a survey after the library session. It asked roughly the same questions as did the pre-class survey. The responses helped us understand and measure the progress students made in searching for and selecting their online sources.

**Participants**

The data represent 596 completed surveys (327 pre- and 269 post-session) from 17 individual Composition 1001 courses. We chose these 17 based on sufficient numbers of pre-class and post-class surveys being returned. Unsurprisingly, student responses to the pre-class survey, needed to conduct the in-class source analysis, ran higher than the post-class surveys, which were purely for our own assessment.

**Research Instruments**

We employed several different tools for getting feedback from the students. While the online surveys were our primary mode of assessment, we captured other feedback to help us put these data in context. For instance, we photographed the whiteboards that students used to record their work. For various reasons, we could not capture all of them, but they served us well when presenting our approach through institutional venues.

We sought instructor feedback in a variety of ways, too. We conducted formal focus groups near the end of the semester that were lightly attended (two to three instructors at two sessions). Another survey, therefore, went out to instructors who had participated in our sessions. This survey yielded 15 responses. We also made efforts to reach out one-on-one to instructors to get their feedback.

**Data Analysis: Considerations and Approach**

To more objectively evaluate students’ progress, we followed a well-documented practice in academic libraries and developed a rubric. One of our inspirations was Lorrie Knight’s assessment of first-year students’ information literacy skills, which used a grading scale. She explained, “A rubric is a valuable assessment tool that provides a reliable and objective method for analysis and comparison.”

Our three-level scale references the Stanford study’s rubric and indicates beginner, intermediate, and advanced skill levels. We assessed three dimensions of our students’ research skills: source quality, search strategy, and relevancy of source in relationship to the research idea. The two librarian researchers then independently scored each dimension for each response in this assessment. The resulting rubric in Table 1 is a marriage of information literacy and skills analysis.

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### Table 1.
Source valuation scoring rubric

<table>
<thead>
<tr>
<th>Beginner (1)</th>
<th>Intermediate (2)</th>
<th>Advanced (3)</th>
</tr>
</thead>
</table>
| **Source quality** | • Without substantive content  
| e.g., personal blog, tabloid  
| • No outside sources linked or cited  
| • Limited scope, not in-depth information  
| • Reference/encyclopedia  
| • e.g., professional blog (Harvard, corporate)  
| • Outside sources linked or cited  
| • Substantive content  
| • e.g., trade publications, journalism  
| (with editorial oversight), academic  
| • Usually has editorial oversight  
| • Citation worthy |
| **Search strategy** | • Went to Google or other search engine  
| and used one of the first results  
| • Used Google or similar, but carefully chose source  
| • Used additional search strategies  
| • Chose a credible database for searching  
| • Intentional about search strategy and selection |
| **Topic relevance** | • Does not directly relate to research topic  
| • Explanation does not match actual content of source  
| • Source content relates to research topic only to a moderate degree  
| • Clearly explains relationship between the research topic and the source |
At the end of the semester, the two librarian researchers independently scored each response to both the pre-surveys and the post-surveys in the classes chosen for the study. We worked together to reconcile any differences.

Findings

Overall, the revised curriculum was a success, based on several different measures, including student surveys, instructor feedback, and self-reflection. Our analysis of pre-class and post-class student survey responses allowed us to measure progress in our three areas of interest: source quality, search strategy, and topic relevance. We solicited instructor feedback through focus groups and informal conversations. Finally, we analyzed our own experiences as instructors throughout the process and discussed partner librarians’ impressions of the curriculum. Each of these measures is discussed later.

Flipped Content Meets Needs

The goal of our survey-based data gathering was to determine if a flipped-classroom activity addressing library and research basics would result in learning outcomes like those for lessons delivered in class. Our findings indicate that these Web-based activities did indeed fill in the knowledge gap when the two groups were compared.

First, we considered results from the pre-class survey (Table 2). Students in the 55-minute classes scored 6.3 percent higher on the overall rubric than their 75-minute class counterparts. The biggest difference shows up in source quality, where students from the shorter class scored an average of 2.6, compared to 2.4. Classes receiving the flipped content also scored higher in search strategy and topic relevance. These scores indicate that the instructional activities completed by students in the shorter class helped them to choose better, more relevant sources using more sophisticated search techniques.

In the post-class survey (Table 3), scores equalized between the two modes of instruction. Both the shorter and longer-class groups had average scores of 2.7 for source quality and 2.9 for topic relevance. This was particularly encouraging since the 75-minute classes received the flipped content in the instruction session, while the shorter classes had their lesson at least a day prior to class. Furthermore, the 55-minute classes scored somewhat better on their search strategies. The results possibly indicate that longer exposure to searching methods made these students more willing to try new methods.

Table 4 summarizes these differences. Both the 55- and the 75-minute classes improved in source quality and topic relevance. The longer classes made greater gains, reflecting the impact of in-class instruction on how to search for sources in an academic context.

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The results possibly indicate that longer exposure to searching methods made these students more willing to try new methods.
### Table 2.
Pre-class survey scoring

<table>
<thead>
<tr>
<th></th>
<th>55-minute class</th>
<th>75-minute class</th>
<th>All</th>
<th>Difference in scores*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>190</td>
<td>137</td>
<td>327</td>
<td></td>
</tr>
<tr>
<td>Percentage of population</td>
<td>58.10%</td>
<td>41.90%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Overall rubric (out of 9)</td>
<td>6.9</td>
<td>6.4</td>
<td>6.7</td>
<td>0.2 (6.3%)</td>
</tr>
<tr>
<td>Joint score for source (out of 3)</td>
<td>2.6</td>
<td>2.4</td>
<td>2.5</td>
<td>0.2 (6.9%)</td>
</tr>
<tr>
<td>Joint score for search strategy (out of 3)</td>
<td>1.4</td>
<td>1.3</td>
<td>1.4</td>
<td>0.1 (9.8%)</td>
</tr>
<tr>
<td>Joint score for topic relevance (out of 3)</td>
<td>2.8</td>
<td>2.7</td>
<td>2.8</td>
<td>0.1 (3.9%)</td>
</tr>
</tbody>
</table>

*55-minute scores minus 75-minute scores, divided by 55-minute scores.

### Table 3.
Post-class survey scoring

<table>
<thead>
<tr>
<th></th>
<th>55-minute class</th>
<th>75-minute class</th>
<th>All</th>
<th>Difference in scores*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>154</td>
<td>115</td>
<td>269</td>
<td></td>
</tr>
<tr>
<td>Percentage of population</td>
<td>57.25%</td>
<td>42.75%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Overall rubric (out of 9)</td>
<td>7.7</td>
<td>7.5</td>
<td>7.6</td>
<td>0.2 (2.2%)</td>
</tr>
<tr>
<td>Joint score for source (out of 3)</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
<td>0.0 (1.1%)</td>
</tr>
<tr>
<td>Joint score for search strategy (out of 3)</td>
<td>2.1</td>
<td>2.0</td>
<td>2.1</td>
<td>0.1 (5.0%)</td>
</tr>
<tr>
<td>Joint score for topic relevance (out of 3)</td>
<td>2.9</td>
<td>2.9</td>
<td>2.9</td>
<td>0.0 (1.3%)</td>
</tr>
</tbody>
</table>

*Monday/Wednesday/Friday scores minus Tuesday/Thursday scores, divided by Monday/Wednesday/Friday scores.
Table 4.
Pre- and post-class comparison

<table>
<thead>
<tr>
<th></th>
<th>55-minute class average</th>
<th>75-minute class average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post-class score</td>
<td>Post-class gain*</td>
</tr>
<tr>
<td>Source quality</td>
<td>2.7</td>
<td>0.1</td>
</tr>
<tr>
<td>Search strategy</td>
<td>2.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Topic relevance</td>
<td>2.9</td>
<td>0.1</td>
</tr>
</tbody>
</table>

* Post-class survey score subtracted from the pre-class survey score.

Table 5.
Breakdown of search strategy results

<table>
<thead>
<tr>
<th></th>
<th>Beginner (1)</th>
<th>Intermediate (2)</th>
<th>Advanced (3)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-class survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of students</td>
<td>243</td>
<td>38</td>
<td>42</td>
<td>327</td>
</tr>
<tr>
<td>Percentage of students</td>
<td>75.54%</td>
<td>11.62%</td>
<td>12.84%</td>
<td>100</td>
</tr>
<tr>
<td>Post-class survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of students</td>
<td>118</td>
<td>12</td>
<td>139</td>
<td>269</td>
</tr>
<tr>
<td>Percentage of students</td>
<td>43.87%</td>
<td>4.46%</td>
<td>51.67%</td>
<td>100</td>
</tr>
</tbody>
</table>

Most importantly for our research, each class made gains on source quality, with the same final average score of 2.7. This strongly indicates that librarian interventions in class had the same result on student behavior as flipped classroom activities had. Neither modality, therefore, is shown to be superior through the data we gathered.

Search Strategy Findings

For both the 55-minute and 75-minute modalities, we saw a significant improvement in search strategies after the class session. Table 4 showcases this dramatic increase at 0.7, nearly a full score higher. Of the 269 students who took the survey, 139 received an advanced score, or all possible three points (see Table 5).

Given that the class session may have been the first time most students used or even knew about library-provided databases such as Academic Search Complete, these
results are not surprising. Since the post-class surveys were mostly completed within 48 hours, students still remembered these databases and could submit this kind of academic resource. What is interesting, though, is the number of intermediate scores, a score of two. These were mostly instances where students incorporated more sophisticated strategies in their use of Google. To us, this indicates that the students understood certain aspects of the keyword discussion, though they might have still been reluctant to use academic databases.

Value Varies by Instructor

The feedback received from instructors varied widely and was closely correlated with level and teaching experience. Most GTAs and new adjuncts responded to the curriculum positively. We often discussed immediately after the sessions how they might push these concepts even further. Many of these instructors used our in-class handout to further research strategy discussions with their students (see Appendix B). We were encouraged by the feedback from focus groups and informal conversations that the lessons on source analysis added a new aspect to their classes.

The reception by more seasoned instructors, however, was at times mixed. Responding to a survey, one faculty member said, “Too much time was spent on the resource review that were based on student texts submitted. I go over much of this in class along the way during the term, and the main reason I wanted the library tutorial was the time to get focused help in how to use the library database system.” Given that most of our Composition 1001 courses are taught by teaching assistants and adjuncts, the curriculum clearly was not tailored to the needs of faculty instructors.

Teaching Practice Impact

The additional time required to review the pre-survey responses prior to the class and to select the sources for class analysis allowed the librarians to become familiar with the students’ research ideas and to arrive for each session with a connection to that class. The librarians found the sessions a fresh experience instead of monotonous routine. We were often surprised with the depth of analysis that students could produce in such a short time. For example, one group discovered that the image in a submitted source did not match the written content. This source had initially appeared in the blog The Conversation: Academic Rigor, Journalistic Flair, which features exchanges between experts and informed lay people. The source was then picked up and published elsewhere with a different image that did not match the content.
Limitations

In reflecting on these findings, we want to acknowledge the obvious limitations of our approach and data. With limited access to our students both before and after our research sessions, we had to rely on a diverse group of instructors for conveying both our surveys and instructional materials to students. While some had the time and ability to carefully review our expectations with their classes, not everyone felt equally invested in our efforts. Therefore, the course sections represented in this research reflect not just higher participation rates but also likely intervention by instructors who effectively emphasized the importance of completing our curriculum. Again, though participation rates among students in the chosen classes were nearly complete, students were, by default, self-selecting because those less engaged with the material would less likely return survey results. Finally, in trying to measure the impact of our flipped content but without the ability to track individual students throughout the three pieces, we were constrained to make assumptions. We assumed that when students arrived at the survey portion they had already completed the interactive tutorial and the video. Though we solicited informal participation feedback in face-to-face interactions, we cannot verify the numbers for full participation.

Future studies into this type of student engagement could make use of existing and emerging technology to more carefully track a student’s interaction with all the online offerings. To achieve this, close cooperation not only with instructors but also with department-level leadership would need to be established. With increased access to the course learning management system, librarians might gather better data. Yet, the time this would require would be difficult to deploy across the large number of courses that usually teach introductory composition.

Discussion

Expanding Students’ Comfort Zone

Getting students to use library resources is more than a how-to lesson. Most database interfaces are somewhat familiar to regular Internet users. Indeed, we consciously use Academic Search Complete because it does not require in-depth knowledge of metadata or Boolean searching. We believe, instead, that increasing student usage of academic databases is about building familiarity. Librarians have long reserved time at the end of a one-shot instruction session for independent searching to build familiarity as well as to provide any support needed.

Looking at the results of our study through this prism, it is less surprising that high-level, concept-based activities had equivalent impacts with in-class lectures. Given time constraints, even in 75-minute sessions, library orientation is always framed as an invitation. We chose to measure use of library resources following the sessions because building comfort is the essential goal, both in academic research and online source analysis. Even if only one or two citations come from non-Google searching, a new experience has been unlocked.

...increasing student usage of academic databases is about building familiarity.
Building Librarian Engagement

When we undertook this project, we focused entirely on the skills our students would build. Insofar as we thought about teaching techniques, it was to serve that goal. However, by adopting an action research framework and documenting our process as much as our outcomes, we began thinking seriously about our own engagement. The curriculum we proposed meant a significant amount of work. Excited by our plans and bolstered by our helpful graduate student, we pursued it anyway.

As the semester progressed, we found that the preparation work made us more enthusiastic, not less. It made us feel more connected and confident in our interactions. Even as we became comfortable with the class format and better able to predict how the discussion might flow, we spent more time reviewing sources, not less. This was true even as we finished up our final courses for the semester. After numerous discussions, the reason for improved librarian engagement became clear: balance. Preparing for student-driven, ever-changing active learning consumed significant time and energy but represented only a portion of the class session. The middle section of both the 55- and 75-minute classes was standardized and familiar. Since the librarians worked from a guiding PowerPoint presentation, they could fall into a familiar groove and relax midway through class. This allowed them to save energy for working closely with students during the activity and directed-searching portions of the class.

Implications

After we had taught roughly half the Composition 1001 sessions, the librarian authors had the opportunity to present our approach and preliminary findings at our institution’s Learning and Teaching conference. Since this event focused on teaching practice, we mainly discussed how we engaged students in our activities and the impact it had on our individual processes. After our talk, we were approached by faculty instructors from a variety of disciplines who wanted to continue the conversation. Many of them were aware of the larger news credibility discussion, but they were also concerned with the implications of source analysis in their own disciplines. For instance, research within the scientific community, even when published in academic formats, still has a landscape full of retracted articles, dubious journals, and debunked findings.

This conference showed us how our specific approaches represented a shift in our ability to articulate information literacy in an academic context. At times, library goals and frameworks can seem removed from the work of the larger university. Our intervention in the classroom can be perceived as a bonus lesson that polishes research assignments rather than directly drives them. By looking at specific instances of sources chosen before our sessions, faculty could more easily see the value of our instruction.
We hope this kind of deep engagement can serve as a model for instructors at other institutions. Finding ways to capture snapshots of the student experience prior to a class session revolutionized the way we approached instruction. While our assessment work made this project time-consuming and detailed, it need not be. The semester after we gathered the data for this research, we used the same curriculum but were more relaxed with our analysis of survey results. This approach cut down on preparation time without compromising the quality of the classroom experience.

**Conclusion**

Designing a new curriculum to address undergraduate analysis of online sources both challenged and exhilarated us as instructors. We not only measurably achieved these learning outcomes but also found new satisfaction in our own teaching practice. Moreover, our collaborative relationships with teaching partners on campus significantly strengthened.

In creating and measuring the impact of our flipped content, we assessed students’ selection of online sources, the relevance of their sources to their research idea, and their search strategy. The online flipped content was as effective as in-class delivery in all three areas. As we had hoped, the students in shorter modalities who experienced the online lessons started the class with observably better abilities to identify quality sources. By the end of the classes, though, both the control and experimental groups showed equal aptitude. Students’ ability to search strategically may indeed affect the quality of their search findings. Although source analysis was our primary focus, we understand that the broader skills of critical thinking and information literacy require a longer process than a one-shot library instruction session.

The new curriculum brought fresh air to our one-shot sessions and to our teaching practice. The prework assignment for students became prework for the librarian instructors as well. By getting a glimpse of our students’ research process, we not only were better prepared for the classroom but also better understood the needs of each individual class.

Finally, we must recognize that part of the success of our source analysis curriculum lies in our students’ ability to engage with one another. By collecting actual student-identified sources and putting them at the center of group activities, we signaled to our classes not only that we took their work seriously but also that we believed they had important lessons to learn from one another. Through this approach, we became more attuned to the actual online ecosystem undergraduates experience. Ultimately, our conversations became richer because they were rooted in our students’ authentic experiences.

**We cannot overemphasize the importance of building relationships with teaching partners.**

**By looking at specific instances of sources chosen before our sessions, faculty could more easily see the value of our instruction.**
We could complete this research only because of receptiveness at all levels. We cannot overemphasize the importance of building relationships with teaching partners. Working with young instructors, including graduate teaching assistants and adjunct faculty, is as important as collaborating with regular faculty. Our library curriculum has become integrated into the composition curriculum over time, so that even though our instruction is often just one-shot, our presence extends before and after that session through prework assignments, our online guide, and print handouts.

Appendix A
Appendix B

RESEARCH HACKS

Key[word]s to Research
- Maintain a list of useful keywords.
- When you look for scholarly sources, use terms scholars use for your topic.
- Use only key terms, not full sentences.
- Put phrases in quotation marks to limit your results to those terms together.
- Note words found in relevant articles.

A Shortcut to Full-Text Reading
Search for terms in a full-text online source.
Ctrl + F

Ask the Right Research Questions
Is this research topic interesting to me?
Does this question challenge what I already believe about my topic?
Can I find enough information?
Does it fulfill the assignment?

Strategic Wikipedia-ing
You can't cite Wikipedia articles, but you may be closer than you think to great sources. Just follow these steps:
1. Scroll to the bottom of the entry.
2. Find the "References."
3. Explore the links to online sources.
4. Check the library for access to articles.
5. Request books and articles not at UC.

Source Analysis Quick Checklist
- Source publication
- Date/timeliness
- Author biography
- Supporting evidence
- Intended audience
- Author's viewpoint

Narrow Your Results Fast!
Use limiters in databases and search tools to narrow results. These are usually on the left.

Limit To
- Full Text Online
- Peer-Review
- In Print

Content Type
- Academic Journal Article
- Magazine/Newspaper Article
- Book/Ebook

Publication Date
1952
2018

UC Libraries Contact
My librarian today: pamela.bach@uc.edu
olga.hurt@uc.edu
rebecca.leporati@uc.edu
Deborah.tensfeld@uc.edu

Research Topic
(1) What do you already know?
Name: ____________________________
Course: __________________________
Date: ____________________________

(2) Research Questions

(3) What did you learn today?

(4) What do you need to explore further?

Best Databases
More at: libraries.uc.edu

Appendix B
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Notes