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Improving and Assessing Information Literacy Skills through Faculty-Librarian Collaboration

Abstract

This article addresses ways to assess the effectiveness of integrating information literacy into college courses by taking a close look at a partnership developed between Dr. Amy Dailey and the reference librarians at Gettysburg College.

Keywords

Faculty-Librarian Collaboration, Information Literacy

Disciplines

Information Literacy | Library and Information Science

Comments

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**Improving and Assessing Information Literacy Skills through Faculty-Librarian
Collaboration**

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ABSTRACT

Academic libraries provide value to their institutions on many levels, one of which is information literacy (IL) instruction. Librarians have the opportunity to guide students through the research process, teach students how to think critically, evaluate resources, and use resources ethically. It is beneficial for librarians to assess student learning after these sessions to demonstrate how libraries support the academic mission of their institutions. This article will address ways to assess the effectiveness of integrating information literacy into college courses by taking a close look at a partnership developed between a professor and two librarians at a small, private four-year institution.

KEYWORDS

Assessment, collaboration, information literacy

BACKGROUND

Information Literacy at Gettysburg College

Located in rural south-central Pennsylvania, Gettysburg College is a highly selective four-year residential college of liberal arts and sciences. The college, which enrolls 2,600 undergraduate students, offers 67 majors, minors, and programs. Although one of the overarching goals of the college curriculum is to “develop lifelong learners who are able to acquire and process information and ideas in multiple ways,” (Gettysburg College 2012) there has been neither an information literacy requirement nor a set course(s) that every student

takes. Thus, any formalized information literacy instruction takes place at the course level, and it must be initiated by individual professors.

As a result of this framework, individual students' information literacy exposure can vary greatly. Regardless of course level, in a given class there may be a handful of students who have attended at least one information literacy session with a librarian; while a few may have attended multiple IL sessions, some may have had no prior IL instruction. This variation in research skills among students results in research papers with a wide variety in quality of information presented, evaluation of information, and appropriate citations of information. While there may be recognition that mastering discipline-specific skills will require additional instruction, professors often assume that students enrolling in upper-level courses have already acquired the basic research and information literacy skills required to critically evaluate information.

While this case study focuses on the experience of one class at one small liberal arts institution, there is growing concern about assessment of student learning nationwide, and information literacy has been a key component of the dialogue. The Association of American Colleges and Universities (AACU) has initiated the VALUE project (Valid Assessment of Learning in Undergraduate Education) which has highlighted information literacy as part of the intellectual and practical skills needed to be liberally educated. Furthermore, AACU, in collaboration with the Association for Prevention Teaching and Research (APTR), the Council of Colleges of Arts and Sciences (CCAS), and the Association of Schools of Public Health (ASPH), has initiated "The Educated Citizen and Public Health" program. In addition, in the Undergraduate Public Health Learning Outcomes Model version 1.0 (2011), health-related information literacy was identified as a necessary proficiency in national undergraduate competencies (Association of Schools of Public Health 2011). These competencies are designed for all undergraduate students, not just students focusing on public health coursework.

The competencies most salient to health-related information literacy relate to effective communication of health information to a wide range of audiences, conducting health-related literature searches using appropriate resources, and assessment of the quality of health-related information and data (ASPH).

The Institute of Medicine (IOM), in its seminal report on *Who Will Keep the Public Healthy: Educating Public Health Professionals for the 21st Century* (2003), has identified core competencies to meet challenges in research, training, and education in improving population health (Gebbie, Rosenstock, and Hernandez 2003). Cobus has discussed the role of library efforts to integrate information literacy into these IOM competencies (2008). The competencies we found most relevant to teaching health-related information literacy skills to undergraduates focused on informatics, health communication, and ethics. The skills associated with these competencies include accessing and evaluating information, differentiating between types of health information available, and appropriately using the information to effectively communicate health information. Moreover, conveying the expectation that good research habits are a matter of ethics for health professionals is a potentially motivating factor for students.

OBJECTIVES

At Gettysburg College a professor and two reference and instruction librarians extensively collaborated together with the objective of addressing information literacy problems identified from previous semesters of teaching an upper-level course in public health. The professor had observed that students identified some of the available information for their research topics but they overlooked many of the most appropriate peer-reviewed research sources. The professor and librarians suspected that some students may have stopped their searches prematurely, after identifying a certain number of sources, or failed to take the extra step of requesting sources from interlibrary loan when articles were not immediately available online. Evaluation of information was also a struggle for some students, which was

compounded by not having all of the information they needed to adequately evaluate a body of literature.

Improving literacy for discipline-specific research purposes requires an integration of information search skills and scientific literacy skills. These two competencies are often disengaged from each other, and, in order to successfully conduct meaningful literature reviews, students need practice integrating them. A professor-librarian collaborative process resulted in the identification of the following four focus areas as targets for instruction and assessment : 1) identifying and reporting reputable public health statistics via the navigation and evaluation of appropriate web-based information sources; 2) systematically identifying appropriate peer-reviewed journal articles in the scientific health literature; 3) accessing and evaluating available information about public health intervention studies; 4) critically evaluating information during the peer review process.

To address these concerns, a collaborative process between the course professor and the librarians was used to restructure an upper-level public health course. Assessment of student learning and the success of this project is the objective of this paper.

METHODS

Sixteen third- and fourth-year undergraduate students enrolled in the course during the spring semester of 2012. The course met three days per week for fifty-minute sessions. Curriculum development and instruction to address each of the aforementioned four focus areas were developed through a collaborative process between the course professor and the librarians. The semester-long research project was revamped to specifically address IL competencies. Tailored in-library instruction related to each step of the project was also developed. A theme of “United States obesity epidemic” was chosen for the course to provide some continuity in instruction and peer interaction.

Semester-long research project overview.

The semester-long project consisted of four major parts: 1) systematic review of an obesity-related topic; 2) systematic review of peer-reviewed evidence of solutions; 3) development of an innovative obesity-related intervention integrating and building upon information analyzed from parts 1 and 2; and 4) peer review of the interventions. For part 1, students were required to develop a public health research question related to the theme of the course (the U.S. obesity epidemic), examining the relationship between a hypothesized “exposure” (e.g., TV watching) and an “outcome” (e.g., adolescent obesity). Students were then required to systematically find and evaluate sources related to this research question. Part 2 of the project involved identifying public health interventions specifically related to their research questions from part 1. This required students to find and evaluate particular types of public health studies. Part 3 of the project required students to integrate the research they conducted from parts 1 and 2 to guide the development of their own unique solution to their chosen obesity-related topic. Finally, we staged a mock scientific review panel, modeled after National Institutes of Health procedures, for the peer evaluation process. This final piece of the project included both oral and written peer critiques, which allowed students to engage with each others’ work, evaluating use and assessment of information gathered and synthesized by their peers.

As this was a very involved, research-intensive process for students, hands-on information literacy instruction was a necessary component for student success. The library instruction provided is detailed below.

Library sessions

The professor and librarians decided that the class would have three information literacy sessions in the library. The goal was to gradually introduce students to different information

literacy skills, and at each subsequent session to reaffirm and build upon the skills and knowledge learned in the previous class.

The first information literacy session took place early in the semester, midway through the second week of classes. This class session focused primarily on statistics: why they are important, how to find them, and how to evaluate them. The first five minutes of class were spent discussing statistics and sources, connecting the library session to the previous class, during which the professor focused on public health data. After this brief discussion, students were then directed to the LibGuide for the class, where the librarians used the polling feature to link to three websites that included statistics on obesity. Websites of varying quality were chosen to provide students concrete examples of sources that would or would not be appropriate for citing in a scholarly paper. Students were told to look at each website individually, and vote as to whether the source was a “credible, cite-worthy source,” a “non-reputable source,” or “don’t know.” After the students looked at all three websites and voted, the results were revealed and the class talked through its votes. This provided the opportunity to stress the importance of evaluating the credibility of electronic sources by examining criteria such as identification of original sources, data currency, and the agendas of organizations providing information. This segued into a discussion on citing and ethically using the statistical sources that were being evaluated. After the session, students applied what they learned by completing a “statistics scavenger hunt” assignment, looking for and citing current, reputable statistics on obesity.

At the end of the third week of classes, the students returned to the library to learn how to identify and locate articles on their individual research topics. In order to get the students to think about the main topics of their research question, the first part of class was spent on concept mapping. After discovering that only one or two students had ever created a concept map before, a short YouTube video created by the University of Illinois Undergraduate Library

was shown (UGLiNSTRUCT 2008). After watching the video, students created their own concept maps using their research topics. Next the librarians divided the class into four groups to share their concept maps with their peers. The group then selected one person's concept map to show as an example and possibly elaborate on. Putting the sample concept map on white boards in the front and back of the classroom, each group shared its map with the rest of the class. The professor, librarians, and classmates all suggested ways to elaborate or refine the concept maps. During this exercise, it was interesting to see two groups present concept maps on the same topic but featuring completely different approaches, highlighting that there are many ways to approach research on a given topic.

Students then took their individual concept map and applied them as they searched within the databases. To start, the librarians had the students do a side-by-side comparison of Scopus and PsycINFO (EbscoHOST) on their own, noting the various ways to limit and refine their results. Student volunteers then shared with the class how they searched the databases, with the librarians chiming in to make sure no pertinent information was left out. After this session, students were required to write a literature review on their facet of obesity.

At the beginning of the sixth week of classes, the students returned for their third and final information literacy session. Since the corresponding assignment was to write a paper on what intervention studies have been done to address the aspect of obesity that the students were researching, we spent the first part of the class discussing research strategies and how their concept maps might change when approaching their topic with a new question, putting a few concept maps on the board. We took time to brainstorm different keywords for "intervention" and wrote them on the board so that students could refer to them as needed (later, the librarians took this list of intervention keywords and made an electronic word cloud that was posted on the course LibGuide). After the librarians and professor clarified for the students how to determine if an article within a database is an actual research study, the rest of

the session was workshop-style, with students searching for intervention studies on their topics and the librarians and professor assisting as needed. At the end, students were asked to fill out an online survey reflecting on their three library sessions.

In addition to these three formalized information literacy sessions that took place during class time, the librarians each offered an “office hour” to meet with students who needed assistance outside class. While, in reality, the librarians’ office doors were always open to students, and their reference desk hours resembled office hours, we found that the idea of “office hours” resonated with students, since their professors have them. It provided yet another avenue to make ourselves available to the students. These office hours, in addition to the librarians’ regular reference desk hours, were advertised to the students and were listed on the course LibGuide for future reference.

Assessment: process and outcomes

Information literacy outcomes were assessed in a variety of ways. First, written research project assignments were graded by the professor. Each of the four components of the semester research project resulted in a major paper that students were required to submit. The grading rubric included components for appropriate identification and use of sources, citation of sources, and critical evaluation of sources. Information literacy was a key component to success in each of the written assignments, given the inextricable link to content and analysis.

In order to assess how well students were able to apply what they learned in the information literacy sessions, the librarians, independently, but with the professor’s approval, planned and conducted three different forms of innovative assessment. The first assessment tool was a generic survey that the reference and instruction department adapted with permission from our colleagues at Shippensburg University. This survey is available for any

instruction librarian to use for information literacy assessment. The link to this survey was included on the LibGuide created for the course, and was available on the first day of classes. This survey included five Likert scale questions about the actual session and three open-ended questions about what was most helpful and least helpful about the session (see Table 1). The goal of this survey was to gather the students' perceptions of how helpful the information literacy sessions were almost immediately after the students participated in them.

Table 1. Questions included in general library instruction survey.

<u>Likert Scale</u>	<u>Free Response</u>
The Librarian clearly explained what I would learn in this session.	What did you find MOST helpful about this session?
What I learned today will help me complete my assignment(s) for this class.	What did find LEAST helpful about this session?
The librarian took enough time in class to demonstrate what we discussed.	Do you have anything else you would like to tell us?
The librarian gave me enough time in class to practice what was demonstrated.	
The examples that were used by the Librarian to explain the material were helpful to me.	

A second questionnaire, with a link from the class Moodle site, was emailed to students during the last two weeks of classes. This surveyed students about what research tools/skills they learned, how the librarians and the library supported them in their research for this

Table 2. Questions included in end-of-semester survey.

<u>Likert Scale</u>	<u>Free Response</u>
The library sessions helped me become better equipped to: Navigate information resource (i.e. library catalogs, databases, websites, etc.).	What research tools/databases or search strategies did you learn as part of doing research for this class?
The library sessions helped me become better equipped to: Evaluate the quality of information.	What are some of the ways the library or librarians supported your research for HS 320?
The library sessions helped me become better equipped to: Find appropriate sources.	Are there other ways that the library or librarians could have supported you better in HS 320? If yes, please explain.

particular class, and what could be done to support them even more, using both Likert scale and open-ended questions (see Table 2). The goal of this survey was to determine how the library assisted students throughout the research process when students reflected upon the entire semester. Both of the questionnaires that students were asked (though, not required) to fill out were implemented using Google Docs (now Google Drive).

In addition to the online surveys, the librarians conducted a more systematic, work-intensive, and direct assessment: a bibliography analysis. This was developed in order to get a more authentic assessment of student learning. After searching for and assessing publicly available information literacy rubrics, the librarians decided to create their own rubric to evaluate bibliographies, one that was developed with this specific course and assignment in mind but could also be adapted for almost any bibliography assignment. The three areas of focus were ethical use of information (complete citations in the proper format), source quality (level of scholarship, timeliness, etc.), and source breadth (variety of journals, as well as appropriate websites and statistics consulted). Scores for each category ranged from 1 to 5, with 1 the lowest and 5 the highest (see appendix). When determining the process for evaluating the bibliographies, the librarians consulted Lorrie A. Knight's article, "Using Rubrics to Assess Information Literacy" (2006). Influenced by this article, both librarians ranked the bibliographies individually before meeting together to combine their scores. If any significant variation in scoring appeared, the bibliography was consulted again, and scores were adjusted accordingly (Knight 2006, 46). Although this piece of assessment was time-consuming, it was also very eye-opening for the professor and librarians. The librarians did not assess the bibliographies until after the papers had been graded by the professor. The scores of the bibliography assessment were compared to the professor's numerical grades. While the professor was grading on many more elements than use of information (e.g., content and style), the librarians were interested in determining if there was consistency in assessment.

In addition to analyzing the bibliographies using the criteria listed above, the librarians also noted the number of citations, since the assignment called for students to be systematic and comprehensive in their reporting of intervention studies. The resources cited were also checked to see if they were available through the library's local holdings, and if not, Google Scholar was searched to see if they were freely available online. The librarians were interested to see whether or not the students were taking the extra step to acquire quality articles that may not have been freely or easily accessible through the library holdings; and potentially utilizing services such as interlibrary loan.

ASSESSMENT RESULTS

The response rate for the general information literacy instruction feedback form (the first questionnaire) was excellent – almost 94%. The results indicated that students found the sessions to be clear and helpful. When asked what was most helpful regarding the sessions, one-third of respondents mentioned brainstorming keywords, closely followed by learning about database specifics. Also mentioned were concept mapping, example searches, and having time to research their own topic during class. When asked what was least helpful, three students mentioned that concept mapping was a little excessive, two students actually said nothing was least helpful, and one student suggested that we could do without the student demonstrations on the podium computer.

The end of semester questionnaire had a slightly lower response rate, with 81% of the class responding. Of the respondents, 92% “agreed” or “strongly agreed” that the library sessions helped them become better equipped to navigate the information resources (library catalogs, database, websites, etc.) and evaluate the quality of information. All respondents “agreed” or “strongly agreed” that the library sessions helped them become better equipped to find appropriate sources. When asked what tools/databases or search strategies were learned

through conducting research for this class, the most common response was refining database results, followed by developing keywords and using specific databases. Reflecting on the ways the librarians supported them throughout the semester, almost one-quarter of respondents mentioned one-on-one research help with the librarians as well as assistance refining research topics. The librarians' availability to answer questions was also mentioned several times.

The bibliography analysis allowed the professor and librarians to objectively quantify how the students applied their information literacy knowledge in the class. While this method did not allow for assessing whether students' scholarly products reflected new knowledge gained from the instructional sessions specific to this course, the professor was able to qualitatively assess if she observed a difference between this semester and past semesters.

The overall scores tallied from the rubric ranged from 3.16 or 63% to 4.66 or 93%. The average bibliography score was 3.98 or 80%. To put these scores into context, the average grade assigned by the professor for the first semester project assignment was 83%. When looking at the three different criteria evaluated using the rubric, the scores are reflective of how much class time was used to address each topic. The criteria that received the lowest score was Ethical Use of Information (proper citations), with an average score of 3.5 or 70% (citations were mentioned at the end of the first information literacy session, but there was not a lot of time devoted to constructing correct citations in the proper style). Source Breadth landed in the middle with an average ranking of 4 or 80%, and Source Quality received the highest score with 4.3 or 86%. Since the librarians spent a large portion of their time with the class discussing evaluation of information, we were pleased that it seemed to have paid off in regard to the quality of sources used in the students' papers.

For the sixteen papers submitted, 155 references were cited; students' bibliographies ranged from six to fourteen citations, with an average of nine or ten. Of the 155 references, only

one was a book. As the most reputable scholarly research from the field of public health is found in peer-reviewed journals, and not often found in other media, such as books, this statistic corresponded to the professor's expectations. Students referenced seventeen websites (some statistical in nature) and 137 journal articles. After checking the library's holdings, the librarians determined that approximately 85% of these sources were available through the library. Six of the journal articles were not available through the library's holdings but were freely available online.

DISCUSSION

Through a collaborative teaching process involving a professor and librarians, improvements in information literacy in an upper-class undergraduate public health class were observed. Students improved in their information searching practices and evaluation skills, identification and reporting of reputable statistics in the field of public health, accessing and using appropriate peer-reviewed journal articles, and critically evaluating information during the peer review process. The two-way exchange between the professor and librarians was a crucial component of this project's success. The professor and librarians carefully planned and worked together to develop the course curriculum before the class began in order to address the four information literacy objectives. The professor was willing to sacrifice class time on public health content in order to have her students receive additional instructions on how to become better researchers. Given the nationwide discourse on assessing student learning, the professor and librarians agreed that teaching undergraduates information literacy skills they would hopefully continue to use throughout their lives was an important and laudable endeavor.

Although the professor was unable to quantify differences across semesters, she was able to qualitatively assess differences in research quality between this semester and previous semesters. The class make-up was similar across semesters—only juniors and seniors were

allowed to enroll in the course and the course consistently enrolls between sixteen and nineteen students per semester. The most notable differences aligned with our intended objectives of providing instruction on identifying and reporting reputable public health statistics, systematically identifying and evaluating appropriate peer-reviewed research, and critically evaluating information during the peer review process. The statistics and research articles used to support and justify their inquiries into particular exposure and outcome relationships, and to answer their research questions, were much improved compared to prior semesters. Some of this improvement may have resulted from the course's cohesive theme, which provided a consistency throughout the semester that students from previous semesters would not have had. Library instruction targeted closely to the theme of the class, as well as students' subsequent research, complemented the course content. Furthermore, students received very detailed instruction on criteria to assess whether statistics found electronically were appropriate for scholarly use. The professor's investment in the students learning how to appropriately find and use information was evident from her willingness to devote three class sessions to information literacy instruction, as well as from her grading rubric, given to students prior to the submission of papers. Students may have viewed this professor's commitment as further incentive to pay close attention to the use of information.

In addition to an increase in quality of written research papers submitted, there was a notable difference in how students reviewed each other's use of statistics and research papers. This was likely due to a combination of providing a theme for the course and by providing more instruction as to how to appropriately use research to support a scientific inquiry or argument. With a theme for the entire class, students were more familiar with each other's topics; in past semesters students were allowed to choose any public health problem to research. It was encouraging to see students note when their fellow classmates backed up their arguments with previous research. In the written peer reviews, several students critiqued their classmates for not fully developing their arguments with the most appropriate information, demonstrating that,

as the reviewer, they were asking the appropriate questions (what evidence is there, and is it appropriate to the topic being discussed). Another student mentioned in her oral review how the proposal she read did a great job of backing up its claims with relevant research articles.

On the whole we were pleased with the students' work. However, through our various assessment tools, we identified several areas for improvement. Although the online questionnaires overwhelmingly suggested that the information literacy sessions and librarians were helpful for students, they also provided us with ideas for future enhancement. While many students mentioned that the concept mapping helped them to develop their research questions, others felt that the process was too redundant. Thus, for the following semester we kept the concept mapping in the second information literacy session, but removed it from the third and final meeting. Based on the feedback on both forms, we also decided to continue to offer librarian "office hours," even though only a handful of students (25%) took advantage of those times. It was clear that students appreciated the availability of the librarians, and we want that to continue.

The bibliography analysis was both frustrating and encouraging. Some students completely misunderstood how to cite their sources properly. While some simply used a different citation style other than the one recommended (APA), others made up their own style, and some paid no attention to style at all, omitting pertinent information including the article's author and journal title. It quickly became very clear that providing additional instruction on properly citing information and placing more emphasis on its importance should receive greater emphasis in the future.

The encouraging part of the bibliography analysis was the quality of the sources listed. Overwhelmingly, the students did a great job of citing scholarly articles that were appropriate to their topic. Since a large portion of the information literacy sessions was spent on finding and

evaluating sources, we were pleased with this outcome. The librarians also found it very interesting to track down the citations' sources. While it was encouraging that the library held 85% of the materials cited in the students' bibliographies, it also caused us to wonder whether or not our students are settling for only those sources that are immediately available while possibly ignoring higher quality materials because they would have to request them through interlibrary loan. We are not quite sure how to accurately determine this, but we will keep it in mind as we discuss future assessment opportunities.

Both the professor and the librarians noticed that some students did not seem to realize the connection between the four components of the semester project. The project's aim was to have each component build upon the previous one, resulting in a peer-reviewed intervention proposal that was grounded in relevant and valid statistics and peer-reviewed research. Ideally, the statistics students identified after the first library session would be incorporated into their literature reviews to convey the importance of their chosen obesity-related research questions. Next, the information from the literature review should be integrated into their intervention proposals to base their own intervention proposals in a body of evidence-based literature. Furthermore, the intention was that during the oral and written review process students would critically evaluate how successful their peers were at integrating statistics and research evidence into argument development for the intervention proposals. As clear as that was to the professor and librarians, there appeared to be a disconnect for some of the students, who seemed to complete each component of the semester project in isolation of the previous components. In future sections of this course, the professor and librarians will place more emphasis on the importance of this integration.

CONCLUSION

Overall there was convincing evidence that the collaborative efforts to improve information literacy, an intentional student learning outcome, were successful in enhancing the quality of research that students conducted. Utilizing three different instances of library assessment, the professor and librarians were able to see tangible results from the extra information literacy instruction. As we modify the assignment and instruction, we hope to reuse these assessment tools in order to compare the results across semesters. Thanks to student feedback, the professor and librarians identified ways to improve the course as well as develop new plans for future assessment. These changes will include pre- and post-testing and student interviews as part of the formal assessment.

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