AC 2011-128: WELCOME TO THE REAL WORLD: SHOWING THE VALUE OF INFORMATION LITERACY BEYOND THE CLASSROOM

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Welcome to the Real World: Showing the Value of Information Literacy Beyond the Classroom
Abstract

College students have a hard time seeing the connection between information literacy and their life after graduation. Showing how information literacy skills are relevant to the work of engineers requires new pedagogies. One such pedagogy is problem-based learning (PBL) where a real-life situation is introduced and students use information literacy skills to complete the assignment. Students will gain essential knowledge while seeing how those skills fit into the engineering design process. This paper will describe problem-based learning as it can be applied to information literacy in engineering classes. The author’s experience in using PBL to teach information literacy in a freshman design class is also described.

Introduction

Conducting information literacy instruction sessions that are relevant and interesting to the students, while providing useful skills, has long been a challenge for academic librarians. Simulating a real-life situation a working engineer will likely encounter in which information literacy skills are needed might be a useful pedagogical method. Teaching information literacy in this way could have the added benefit of enabling students to see how those skills will be needed when they are working as engineers. If students feel information literacy is relevant, they might be more engaged in the learning process than if it was seen as just another assignment with no meaning in the real world. This paper describes a method of placing information literacy instruction within a problem-based learning assignment in a real-world scenario.

Literature Review

There are many examples in the literature describing ways to deliver information literacy instruction to engineering students. However, there are only a few examples of using a real world situation or problem to introduce information literacy skills to students.

Macklin describes a method for teaching information literacy using problem-based learning. He explains that this “… teaching strategy takes everyday situations and creates learning opportunities from them.” Snavely writes that, “Librarians collaborate with instructors to set up problems and questions so students will participate in their own discovery and learning.” Kesselman and Sherman helped to develop an interdisciplinary course with faculty from Communication, the library school, and Food Manufacturing Technology. Students worked in teams to solve a problem posed by an industry partner. Information literacy skills were incorporated into the curriculum and related to the real-life industry problems. This was a for-credit, semester-long course making it different in some ways than the other studies mentioned here as well as the one conducted for this paper. David H. Jonassen, who delivered a Distinguished Lecture during the 2010 ASEE Annual Conference wrote a book entitled Learning to Solve Problems: A Handbook for Designing Problem-Solving Learning Environments. Jonassen, while never mentioning information literacy, does provide a detailed framework for developing problem-based assignments. Hsieh and Knight describe a study in which they
compared lecture-based learning with problem-based learning (PBL). They conclude that “PBL can be an effective pedagogical approach for information literacy instruction to engineering students.” In terms of ABET, the authors state that such an assignment would “…fulfill ABET’s required ‘soft skills’ requirement for all engineering programs…”

**ABET and Problem-Based Learning**

ABET Criteria 3 calls for graduates to have an ability “…to function on…teams … to communicate effectively…to engage in life-long learning…to use the techniques, skills, and modern scientific and technical tools necessary for professional practice.” Engineering librarians and some teaching faculty consider information literacy skills to be one of those techniques, skills and technical tools (sometimes referred to as the “soft skills” portion of ABET). There are faculty and students who do not see the connection between information literacy skills and ABET or the practice of engineering. An exercise that can do that is one that allows students to pretend they are working engineers solving a design problem and needing information.

It is through the “soft skills” of communication, life-long learning, and teamwork that librarians can make a case for real world, problem-based assignments that include information literacy components. Through such an assignment the students are applying technical and scientific skills they learned in previous courses while also developing their skills as information literate engineers. While completing the assignment, students are also being shown that seeking and using information from a variety of sources is part of the engineering design process. In a 2004 study, Napp found that 74.4% of design firms responding did not employ a degreed librarian. Further, in 79% of those firms engineers obtain information on their own. This is evidence that working engineers need information and need to be able to locate it independently.

**Methodology**

In August of 2010 the Engineering Librarian approached a faculty member in the Electrical Engineering and Computer Science department at The University of Toledo with the idea of collaborating. It was proposed that as part of the freshman design course the students would be told to identify off-the-shelf products /devices that could assist senior citizens having mobility or cognitive impairments with staying in their own homes. These would all be electrical or computer devices as opposed to wheelchairs, walkers, etc.

An information literacy instruction session was conducted by the Engineering Librarian during the same class period the students were given the assignment. Sources for standards, articles, government documents, patents and books were covered. There were about 120 students in the course. Students worked in teams to identify the devices that could be used. They were also to identify relevant standards, patents and other documents that applied to their project home. A report listing the devices found along with any standards, patents, etc. was turned in for a project grade.
Survey Results

Once the students turned in a report for their team, a survey was given to assess their feeling about the assignment and their sources (see Appendix for the survey instrument). Ninety students filled out and returned a survey. Eighty percent of those responding indicated that the assignment simulated a real-world situation. The first question in the survey asked “Which information types did you use in this assignment? (check all that apply).” The item “articles” was selected by 89% of respondents. “Books” was selected by 42% of respondents, “standards” by 19% of respondents, “patents” by 16% of respondents, and “government documents” by 5% of respondents.

### Survey Results Table

<table>
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<tr>
<th>Question 1</th>
<th>Patents</th>
<th>Standards</th>
<th>Articles</th>
<th>Books</th>
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<td>17</td>
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<td>Expected</td>
<td>Less time</td>
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<td>72</td>
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</table>

Eighty-eight percent of respondents agreed with the statement “Engineers need to know how to locate technical information.” There were 41% of respondents who agreed with the statement I will be able to locate all the information I need on Google.” It is encouraging to note that only 2% of the students responding agreed with the statement “Once I’m done with school I won’t have to do anything like this again.”

This type of assignment fits into the broad category of “problem-based learning” or PBL. While this approach to teaching has been around since the 1960s when it was first used in medical education, its use in engineering education is relatively new. As the name implies, in problem-based learning students are presented with a real-world problem having no single solution. Often this problem relates to the student’s major. Teams of students work together toward a solution to the problem. In engineering courses it is possible to make information literacy instruction part of the project. Working engineers need to locate information so if an assignment is simulating a real-world situation information retrieval and use could be included.

Conclusions
One problem with assignments of this type is finding a course and instructor willing to collaborate with a librarian to develop a suitable assignment. There also needs to be time set aside for information literacy instruction session especially if you are proposing this for a freshman or sophomore level course where the students are unlikely to have received such instruction before.

It is also important to clearly state the objectives and expectations for the assignment. Do you and the course instructor expect a written report from each student or one from the team as a whole? Is the report to have a bibliography and what format should be used? Expectations about collaboration between teams and within teams should be established as well. Since working engineers often work in interdisciplinary teams, some level of collaboration seems appropriate. Grading of the finished assignment can be done by the course instructor and librarian collaboratively.

References


6 Ibid.


9 Ibid.
Appendix

Survey Questions

1. Which information types did you use in this assignment? (check all that apply)
   __ Patents   __ Standards   __ Articles   __ Books   __ Government Regulations

2. Did you...
   __ spend more time than I expected looking for information
   __ spend the amount of time I expected to locate information
   __ spend less time than I expected looking for information

3. Time spent on information finding part of assignment:
   __ less than one hour   __ one hour   __ more than one hour   __ two hours
   __ more than two hours   __ three or more hours

4. Was the session with the Engineering Librarian useful, confusing, no help?
   __ useful   __ confusing   __ no help

5. Check the statements below, if any, you agree with.
   __ Engineers need to know how to locate technical information.
   __ I will be able to locate all the information I need on Google.
   __ Once I’m done with school I won’t have to do anything like this again.

6. This assignment simulated a real-world situation?
   __ Yes   __ No