Information Literacy Instruction Assignment In An Online Module

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Information Literacy Instruction Assignment

In an Online Module

Abstract

One problem with trying to introduce information literacy skills to engineering students is that some faculty are reluctant to change their courses to include this new material. Other faculty have difficulty developing an assignment that will require students to learn and use information literacy skills. Having had success with a freshman orientation class, a librarian and instructional designer collaborated to transform that assignment into an online module. The module was created in Blackboard and was designed to be generic enough so that it can easily be modified for any course. The assignment asks students to work in teams on a design project. The specific design project can be determined by the course instructor, making the module customizable to any engineering discipline. Students are told that early in the design process working engineers need to gather and analyze information from a variety of sources. Students will submit a report outlining their research process along with a bibliography of the sources they used. These reports will be evaluated on the clarity of the writing, the variety and appropriateness of sources cited, as well as the accuracy of the citations. This module teaches information literacy skills while also showing how those skills are part of the engineering design process.

This paper will describe the process by which this module was developed, how this module can be integrated into courses, and how this module teaches information literacy while also showing how those skills are part of the engineering design process.

Introduction

The University of Toledo has determined that the core curriculum would be framed around these five competencies: communication; scientific and quantitative reasoning and literacy; personal, social and global responsibility; information literacy; critical and integrative thinking. An information literate student is defined by the Association of College and Research Libraries as "…able to determine the extent of information needed, access the needed information effectively and efficiently, evaluate information and its sources critically, incorporate selected information into one's knowledge base, use information effectively to accomplish a specific purpose, and understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally."[1]

With the intention of helping to satisfy the University's goal regarding core competencies and meeting the ACRL definition, an online module based around an assignment developed for a freshman electrical engineering and computer science course was developed. The assignment was modified to be generic enough to be customized by faculty in any engineering department.

Literature Review

Computer-based tutorials for information literacy instruction have been in use since the 1980s. Librarians at the University of Delaware launched PLATO (Programmed Logic for Automatic Teaching Operations) in 1981 to replace their general bibliographic instruction sessions.[2] The

use of a problem-based pedagogy for information literacy instruction is a relatively recent development. Delivering information literacy instruction to engineering students through an online module using a problem-based pedagogy is being used successfully in some libraries.

Dewald examined the ways in which distance learning is most effectively delivered. Since information literacy tutorials or modules lack a face-to-face interaction it is useful to think of these tools in terms of distance learning. The author found that active learning, strong pedagogical methods, and assessment are the keys to successful distance learning. [3]

Ping describes a study in which the researchers identified 31 of the tutorials selected by members of the ACRL Science & Technology Section (STS) Information Literacy Committee. The tutorials were analyzed for the topics and STS information literacy standards covered, and the quality of the pedagogy employed. In particular, the authors were looking for some type of active learning component in the tutorials. Approximately one quarter of the tutorials in the sample did not use any active learning elements. One quarter used minimal active learning elements.[4] Problem-based learning was a form of active learning.

A study by Carder describes why, when, and how to use problem-based learning for information literacy instruction. The authors discuss how problem-based learning is effective in information literacy instruction because it allows students to apply "library skills to the solution of meaningful problems". As a result, problem-based learning gives those skills greater relevancy. [5]

Diekema was part of a group that developed an online module for information literacy instruction. Their module could be used as a stand-alone course, a tutorial, or as an assignment within another course. Their module made use of problem-based learning. Many of the students in this study learned new ways to look at the research process. It was also reported that student engagement increased. [6]

Methodology

In this project it was decided that a stand-alone module was not what was wanted. It was felt that faculty would be more likely to use a module that could be easily customized to their course than use a module that appeared to be a generic library assignment. The literature showed evidence for the effectiveness of active learning and problem-based learning.

A librarian and an instructional designer decided to collaborate on the development of a web-based learning module for information literacy aimed at engineering students. The module was based on an assignment that was used in a freshman design class in the computer science and electrical engineering department.

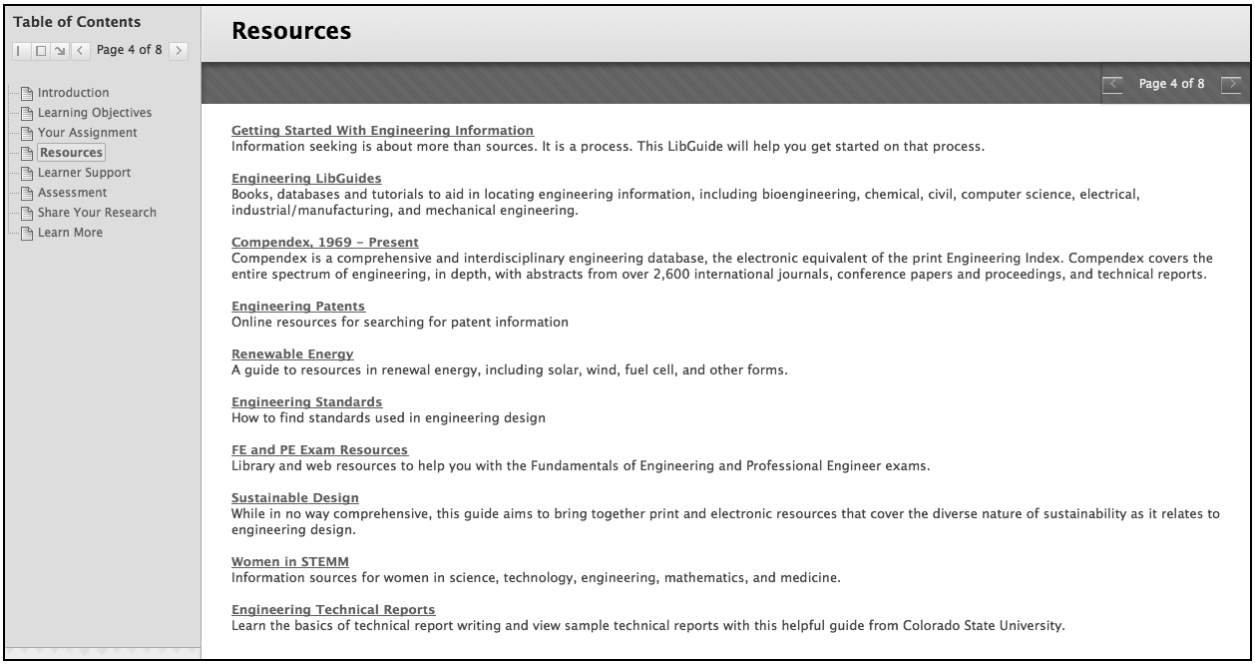
The assignment has the students working as part of a team on a design project. What they are to design can be determined by the course instructor, making the module customizable. Within the

module students are told that working engineers need to gather and analyze information from a variety of sources early in the design process.

The original assignment emphasized problem-based learning (PBL), an active learning strategy developed in the 1960s by medical educators that emphasizes collaboration among groups or teams of students in the form of a problem to be solved.[7] This pedagogy has been adapted in recent years for use in fields such as engineering. The original assignment was modified for a blended or web-assisted learning environment in order to utilize Blackboard, the University's course management system, and a wide range of web-based resources and services available at the University.

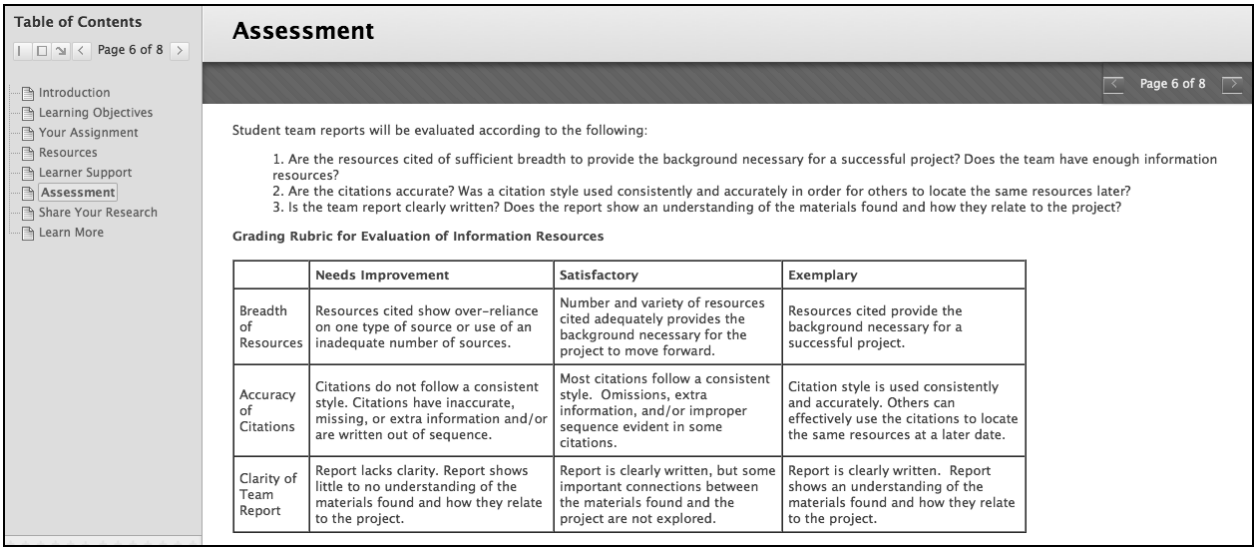
The modified assignment emphasizes student-to-student interaction among groups or teams of students working collaboratively, student-to-content interaction through independent research and writing, as well as student-to-faculty learning experiences facilitated by engineering librarians, writing tutors, and course faculty.

At the beginning of the design process, the librarian and instructional designer identified and refined the learning objectives for the module and compiled a set of self-paced web resources for student use. Included in this set were LibGuides, previously designed by the librarian, that addressed a wide range of interdisciplinary topics and areas of specialization in the field of engineering, ranging from databases and patents to renewable energy and sustainable design. Also included is a chart listing what should be included in the technical report to be turned in by each team.



An analytical rubric was developed to assess student team reports according to a pre-determined set of criteria. Individual criteria addressed the breadth of resources, accuracy of citations, and

clarity of the team report; levels of achievement established performance benchmarks for work that was satisfactory, exemplary, or in need of improvement. Within Blackboard, faculty can further customize this rubric to fit the scoring and/or grading model used in the course.



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Assessment

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Student team reports will be evaluated according to the following:

1. Are the resources cited of sufficient breadth to provide the background necessary for a successful project? Does the team have enough information resources?
2. Are the citations accurate? Was a citation style used consistently and accurately in order for others to locate the same resources later?
3. Is the team report clearly written? Does the report show an understanding of the materials found and how they relate to the project?

Grading Rubric for Evaluation of Information Resources

	Needs Improvement	Satisfactory	Exemplary
Breadth of Resources	Resources cited show over-reliance on one type of source or use of an inadequate number of sources.	Number and variety of resources cited adequately provides the background necessary for the project to move forward.	Resources cited provide the background necessary for a successful project.
Accuracy of Citations	Citations do not follow a consistent style. Citations have inaccurate, missing, or extra information and/or are written out of sequence.	Most citations follow a consistent style. Omissions, extra information, and/or improper sequence evident in some citations.	Citation style is used consistently and accurately. Others can effectively use the citations to locate the same resources at a later date.
Clarity of Team Report	Report lacks clarity. Report shows little to no understanding of the materials found and how they relate to the project.	Report is clearly written, but some important connections between the materials found and the project are not explored.	Report is clearly written. Report shows an understanding of the materials found and how they relate to the project.

An asynchronous discussion forum was added to support opportunities for student-to-student and student-to-faculty interaction, and to collect, share, and assess student research. A brief list of websites was provided at the end of the module in order to provide students with additional sources of assistance. Custom graphics were added throughout the module in order to gain student attention and appeal to visual learners.

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Introduction

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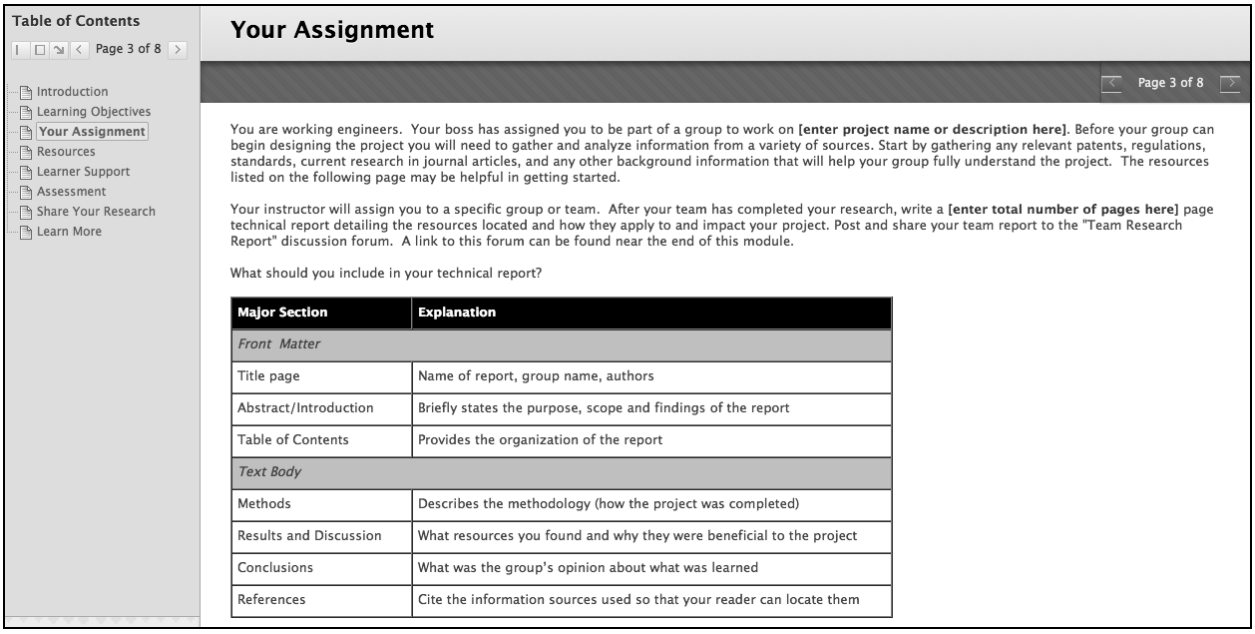
When you think of the skills necessary to succeed in the field of engineering, science and math are probably what comes to mind. While it's true that science and math skills form the core of engineering, the ability to **locate, evaluate, and use information (information literacy)** is an essential skill for the practicing engineer. Modern engineering is cross disciplinary requiring practitioners to use information from a wide variety of sources. Emerging areas such as sustainable engineering or green energy are especially dependent on the latest research, governmental regulations or other industry standards.

This assignment will show how information literacy is part of the engineering design process. It will also teach that skill by asking you to imagine you are a working engineer.

As an engineer, your boss has asked you to be part of a team working on a new project. Since this is a new project, your team will need to locate and evaluate relevant patents, standards, regulations, research, etc. You will also need to write a report detailing the resources located and how they apply to and impact your project.

Portions of the assignment, including the project name and scope, were intentionally left blank so that faculty can customize the assignment in order to meet the unique needs of course-level learning outcomes and time constraints. This strategy was used to enhance portability and adoption among faculty within engineering regardless of discipline.



Blackboard's Lesson Plan tool enables one to introduce lessons or units of instruction to students, and helps to articulate specific information related to the lesson, such as the instructional level and the subject area, as well as learning outcomes and core competencies addressed by the lesson.

A link to the learning module was housed inside the lesson plan. A learning module in Blackboard is a tool that enables content, assessment, and communication tools to be packaged and displayed within one unit of organized instruction. Items within a learning module are presented sequentially in a path determined by the faculty or instructional designer; however, faculty can choose whether students should view the content sequentially or whether they can freely navigate to any area of the module in any order.

Once the module was designed, evaluated, and refined, a "plug-and-play" archive was made using Blackboard's Archive Course function. This package was distributed to faculty and teaching assistants via the University's Faculty Resource Center – a self-paced resource center in Blackboard designed to support faculty engaged in web-based teaching. Faculty from all disciplines and levels of instruction can view and access the contents of the package, and download the package at their convenience. Faculty can then import that package into their own course using the Import Package function of Blackboard. Once the package has been imported, faculty can further customize the module to suit their instructional strategies, schedule, and course goals.

Discussion

The module was only recently rolled out so feedback has been limited, but positive. Faculty seem to like not having to develop an assignment for information literacy on their own. Students who have commented on the module have remarked on the ease of understanding and the links to resources. Once the module has been in use for a full semester or two we will have a better understanding of the effectiveness of this tool.

It is recommended that librarians interested in developing a module like the one described in this paper work with an instructional designer. While a librarian knows how to teach information literacy, developing an online module involves unique design, technological, and stylistic strategies that many librarians may not be trained to address. These strategies - such as the use of a rubric to assess student work, or the development of a guide for what should be included in the team report - can best be addressed through the collaboration of librarian and instructional designer.

It is also helpful to have deadlines along the development process to keep the project on track. This is particularly true if team members are in different departments/colleges or on different parts of campus. Being realistic about the time necessary to complete the project and the other time commitments team members have will also be useful.

[1]"Information Literacy Competency Standards for Higher Education." Association of College and Research Libraries, http://www.ala.org/acrl/standards/informationliteracycompetency.

[2]"Univ. of Delaware uses PLATO for bibliographic instruction." *Library Journal* 106, no. 12 (June 15, 1981): 1266.

[3]Dewald, Nancy, Ann Scholz-Crane, Austin Booth, and Cynthia Levine. "Information Literacy at a Distance: Instructional Design Issues." *The Journal of Academic Librarianship* 26, no. 1 (2000): 33-44.

[4]Li, Ping. "Science Information Literacy Tutorials and Pedagogy." *Evidence Based Library & Information Practice* 6, no. 2 (2011): 5-18.

[5]Carder, Linda, Patricia Willingham, and David Bibb. "Case-Based problem-based learing: Information literacy for the real world." *Research Strategies* 18 (2001): 181-190.

[6]Diekema, Anne R., Wendy Holliday, and Heather Leary. "Re-Framing Information Literacy: Problem-Based Learning as Informed Learning." *Library & Information Science Research (07408188)* 33, no. 4 (2011): 261-68.

[7] Carder. "Case-Based," 181.