Academic inquiry requires critical thinking and is based on the ability to determine the information you need, locate, evaluate, synthesize, and utilize that information. This ability is known as information literacy. As many students arrive at college without such a skill set, equipping them with the ability to utilize diverse sources of information properly has become an important part of higher education and provides a basis for lifelong learning. This collaboration was designed for undergraduate industrial technology students to bridge the information literacy gap between high school and university and gain the skills necessary for the future.

The Making of Sustainability: A Case Study of an Undergraduate Technology Course Project

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Abstract

21st century engineers need skills not just to develop technologies but also to assess broad implications of these technologies. We present a faculty-librarian collaborative project designed to enable students to acquire both technical knowledge and information literacy skills to assess needs, research and evaluate emerging technologies, identify social, economic, and environmental issues, synthesize findings, and make sound decisions in a global economy.

Background

The collaboration between the instructor and librarian was primarily focused on teaching the students how to utilize library and online resources to collect and evaluate information, analyze and synthesize data, and determine the feasibility of deploying a particular technology. The two instructors completed the following tasks:

- Developed research guides to direct students toward resources about information literacy, data analysis, sources, searching techniques, etc.
- The 2.5-hour library training session included an information literacy test prior to the assignment.
- Presentations and assignments were graded independently by the instructor and librarian and grades were discussed in the context of learning outcomes and perspectives.

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Course Learning Objectives

Industrial Technology 150: Industrial Power Systems

Course learning outcomes were mapped to Industrial Technology Learning Goals:

- Students will learn methods of energy production and conservation.
- Students will understand the impact of energy consumption and power system usage on human and environmental health.
- Students will identify the capacity limitations of common methods of energy production in terms of availability, efficiency, and sustainability.
- Students will determine the basic skills needed in diagnosing and handling power systems.
- Students will understand the role of electrical energy in the transmission and distribution of energy.
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- Students will develop the skills needed to evaluate information and analyze and synthesize data, and determine the feasibility of technology deployment.

Preliminary Findings

The pre-test result revealed that students’ information retrieval and evaluation skills ranged from adequate to poor. Students’ initial feedback on the Library training session was positive, especially regarding the usefulness of critical management software. This finding is interesting, as most students felt that they had already mastered these skills and did not need the training. To determine if the students had indeed learned and utilized this knowledge in the assignment and presentations, it was evident that the students did indeed utilize reliable resources and were able to articulate the additional information that they would like to learn. It appears that giving the students an opportunity to organize information via tagging, notes fields, linking to additional resources, and linking to other resources is a common practice. The students identified the need to consult both instructional and reference materials for the students ahead of time. It was not initially found that assignments for the remaining assignments is that the instructions and rubrics will need additional explanation.

Research Assignment Components

Assignments were designed to help students progress in steps (familiar and build on what was discovered)

Research Prepositional Essay and Presentation

- Rationale for selecting the country of interest and justification for selecting the power system technology for potential adoption.
- Clearly describe research questions that cover various aspects of deployment in order to determine whether the implementation of such technology would be successful.

Background Essay and Presentation

- Rationale for selecting a particular technology application and comparison with current technology for the same application.
- Current information on topics, words researched, initial analysis of information collected, and analysis of what issues still need to be explored.

Technology Deployment Essay and Final Presentation

- Overview of the project report: country (location, population, economics, culture, education), technology (operation principles, cost of ownership), and evaluation.
- Proposal solution. Note whether or not the technology has the potential to be adopted, propose a plan for implementing it or finding an alternative solution.

Further Reading


Recognizing the importance of developing critical thinking and information literacy skills, this collaborative project focused on teaching students how to utilize library and online resources to collect and evaluate information, analyze and synthesize data, and determine the feasibility of deploying a particular technology.