Information Literacy in Mechanical Engineering

Farshid Zabihian
West Virginia University Institute of Technology

Introduction and Objectives

It is ironic that in the so called "information age", we have "information literacy crisis". For students, search for information is equal to "Google" or "Wikipedia". Also, they commonly do not know how to properly acknowledge others' work. The objective of "Information Literacy in Mechanical Engineering" is to add components to the program that can fix these fundamental problems in engineering curriculum.

Discipline: Mechanical Engineering

Student level: Seniors

Specific course: Mechanical Engineering Systems Design I (MAE 480)

Developmental History of Innovation

The Information Literacy Course Enhancement Program (ILCEP) is an initiative sponsored by the West Virginia University (WVU) Libraries and the Office of the Provost. The objective of the program is to stimulate students to develop new research capabilities. The students learn to think critically about what and how they search for information, become more discriminating about the sources they use, and be aware of ethical and legal way of using information.

Learning Activities and Materials

Information literacy (IL) is the ability to:
- Identify information needs;
  - Various types of information sources:
    - Primary vs. secondary information,
    - Peer-reviewed vs. non-peer-reviewed sources,
    - Scholarly vs. popular sources,
    - Journals vs. magazines,
    - Databases vs. internet;
  - Keyword search vs. field search;
  - Abstracts vs. full texts;
  - Library of Congress Subject Headings;
  - Boolean concepts;
  - Trade literature.
- Access information from diverse sources;
  - Public library;
  - WVU library;
  - Vining library;
  - Search online information using the tools and techniques learned in the class:
    - Google,
    - Other search engines;
  - Locate more traditional technical and engineering resources;
  - Government resources;
  - Patents;
  - Interlibrary Loan Service.
- Evaluate quality and validity of sources;
  - **A**uthority;
  - **B**ias;
  - **C**urrent;
  - **D**ocumentation.

Learning Activities and Materials

- Apply information critically, legally, and ethically to produce new knowledge;
  - How to avoid plagiarism;
  - Why and how to cite;
  - Various citation styles (APA, MLA, ASME, and IEEE);
  - Intellectual properties:
    - Patents,
    - Copyright,
    - Trademark;
  - Concept of common knowledge;
  - Concept of fair use of copyrighted material.
- Communicate new knowledge in various forms;
- Apply learned skills as tools for lifelong learning.

Execution

The main idea is to help students to think like a researcher when they are looking for information:
- Integrated three librarians into the course to form an instructional team;
- Students spent more time in the library;
- Out-of-class time for students-librarian face-to-face meetings;
- Prepare search strategy;
- Plagiarism avoidance online tutorial and quiz;
- Pre- and post-tests.

Major Issues to Resolve

Once I conducted a survey in my classes by asking students "How many times a semester do you go to the library?" About 70% answered less than once a semester. When I asked them "When was the last time you went to the library?" the average answer was approximately 3 months ago. In majority of the courses I teach, I asked students to conduct some sort of literature review related to the course topic. When I asked them what the first step is, they almost always answer "Google it!" or in the best case "Find the related article in Wikipedia!" The other side of the problem is that students do not know how to properly acknowledge others' work.

Acknowledgments

Institute of Technology
West Virginia University.

NATIONAL ACADEMY OF ENGINEERING OF THE NATIONAL ACADEMIES