"Twitter...Sick": evolution of an engineering information literacy session

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Abstract
This paper examines the evolution of information literacy sessions developed in collaboration with the Faculty of Engineering offered to first year undergraduate engineering students at the University of Calgary. Every year over 700 students are enrolled in ENGG 253 Engineering Design and Communication II. For the last 7 years the engineering librarian has offered information literacy sessions during the student’s lab time. The sessions are designed to offer hands on experience with key engineering resources and to encourage students to explore the Library through various learning activities. The set up is unique and involves using an established Robotel computer lab to simultaneously teach groups of about 125 students working in 4 different labs. The librarian provides the instruction remotely from a broadcast booth and works cooperatively with library facilitators in each lab to answer questions. Over the last seven years different approaches have been taken to try to overcome the teaching challenges associated with instruction of this kind.
This paper will review lessons learned through the evolution of these sessions and discuss changes made in response to faculty and student feedback. It will discuss our growth from instructing with PowerPoint to web based library guides, from having the students write annotated bibliographies to having them complete short bibliographic searching assignments. It will highlight strategies used to engage large numbers of students remotely including our recent use of Twitter, and will cover future plans for a responsive redesign of the course and in turn the library instruction sessions.

1 Course description
ENGG 251/253 Engineering Design and Communication, a full year required course, challenges first year students to deal with real world problems, requires them to delve into their own experiences and knowledge, and to relate this to the engineering knowledge developed throughout the year [1]. The learning objectives for the course involve introducing the students to basic design methodology, written literacy and visual literacy [1]. With over 700 students enrolled in the two term course a team approach is needed. Instructors come from the Faculty of Engineering, and the Departments of Communications and Culture, and Fine Arts. The set up is unique and includes four linked labs that run concurrently with coaches (graduate student teaching assistants) assisting in each lab. A Robotel computer lab system was purchased and installed in the lab around 2002. This system allows for simultaneous instruction for all four labs from a broadcast booth. It also allows the instructors to control all computer monitors within the labs. Although the Robotel system is not the preferred teaching tool for most course instructors it is an effective way to reach every first year engineering student within a short time. The students work in teams of four and their workstations include a computer and two monitors. They are required to keep a portfolio of their work to demonstrate the progress of their learning throughout the class and they are asked to record their activities in a logbook [1].

2 Library Involvement
The engineering librarian became involved in ENGG 253 early in its development. The goal with any first
year undergraduate engineering information literacy session should be to introduce the student to core, “foundational” engineering related resources [2]. Building on criteria established by the Canadian Engineering Accreditation Board (CEAB) related to the ability to investigate complex problems and standards developed by the Association for College and Research Libraries around information literacy, a library instruction session was designed for students in this course [3]. Information literacy in science and engineering is defined as “a set of abilities to identify the need for information, procure the information, evaluate the information and subsequently revise the strategy for obtaining the information, to use the information and to use it in an ethical and legal manner, and to engage in lifelong learning.”[4].

For the last seven years, the engineering librarian has participated in ENGG 253 by teaching a session during scheduled lab time. The goal of each session is to expose students to the tools and processes required for using engineering research resources. Each session has at least 100 students divided among four separate but connected labs. The librarian broadcasts the session and library facilitators in every lab act as conduits between the lab and the librarian in the broadcast booth. Each session runs 1.5 hours in length. This process is resource intensive and it is a challenge to ensure that students are actively engaged with the material while respecting the various learning styles that exist. Without having a formal assessment procedure in place, the sessions have changed and developed as a result of anecdotal feedback from students, course instructors and library facilitators.

3 Delivery of Instruction

As with any instruction session it is recommended that an engineering information literacy sessions be well organized, logical and “objectively worded” with an emphasis on the transferability of information skills [5]. From 2003 to 2008 PowerPoint was used as a way to deliver effective, organized information literacy sessions for ENGG 253. While the PowerPoint presentation was created for clarity and ease of instruction by the librarian it became cumbersome to continually update and seemed outdated when there were other instruction options available. The one-way delivery method of PowerPoint presentation software did not readily allow for active learning opportunities with the student.

In 2009 the University of Calgary Library began using LibGuides (Springshare), an online platform for creating subject specific guides. Instructors asked for a “one stop shop” guide for the class that would cover the basic resources needed to complete the assignments. From this feedback a single guide called “Introduction to Research in Engineering” was created using LibGuides [6]. The guide provides not only an overall look at research in engineering but is tailored to the requirements of the students’ assignment including recommended databases and vetted websites. The various pages within the guide address topics like defining your topic, evaluating web pages, searching for patents, and citing your sources. This guides format allows for more interactivity including setting up web 2.0 applications such as RSS feeds, uploading videos and attaching documents. Ultimately this guide became a more dynamic and appealing instruction alternative to PowerPoint. An added benefit of this type of guide is that it lets students review the entire library session once they leave the lab. It is also a great resource for the lab coaches and empowers them to answer students basic research related questions. Within the first two weeks of the guide being published there were approximately 1500 site visits. By the time the assignment was due three weeks later the site hit statistics were closer to 2600. Obviously the teams were using the guide – a measure of its success.

4 Learning Activities

It is a priority in this class to showcase the depth and breadth of engineering related research resources. The information literacy learning outcomes for this course are as follows.

Students should be:

- Able to use the library resources online and in person
- Aware of the variety of resources available to them for their research (conference proceedings, handbooks, patents)
- Able to evaluate web resources
- Familiar with appropriate citation styles.
Student learning in this class relates directly to how engaged the students are with the material. Student interest in any class can be a challenge even more so when you are dealing with 100 or more students at a time and instructing from a remote location. Without face to face time with the students you do not have the visual cues to determine whether they are paying attention to the material and actually learning something. Over the years various active learning strategies have been employed including discussions, brainstorming and short bibliographic search assignments. These activities were designed to try and keep the students interested. They were also designed to be relevant to the class assignment. The learning activities are discussed in greater detail below.

4.1 Annotated bibliography

From 2003 to 2007 the students had to write an annotated bibliography with at least 5 entries that included two journal articles, one conference paper, one website and one patent. Each entry had to include a 3-5 sentence description which highlighted the type of source, its reliability, a summary of the content and the item’s potential use for the course project. The assignment also had to be completed using the IEEE citation style. This activity was designed by the engineering librarian, marked by the coaches and was considered part of the term mark. The assignment also had to be completed using the IEEE citation style. This activity was designed by the engineering librarian, marked by the coaches and was considered part of the term mark. This activity was initially the only way to assess learning in the class. Not surprisingly students disliked the assignment and over time the quality deteriorated. They assigned this activity a lower priority and would often populate their entries with the first full text results they could find. The coaches found the assignment challenging and time consuming to mark. This learning activity was dropped in 2007 after considering feedback from the students, coaches and course instructors.

4.2 Bibliographic searching

In 2008 short bibliographic searches replaced the annotated bibliography. Currently students are asked to complete three short team based information seeking activities. They need to find a book and a journal in the library catalogue and explore a relevant engineering related topic in a database. This type of hands on learning with engineering resources encourages students to explore and become familiar with the basic mechanics of the Library. An example would be:

Assignment #1 Finding a book and journal in the Catalogue. Record your answers in your logbook:
1. Find your book in catalogue.
   What is the call number and location?
   What is one subject heading for the book?
2. Find your journal in catalogue.
   List one database that provides access to this title.
   List the dates this database covers for this title.

Short in class activities like this allow for more interaction between the library facilitators and the students. In the first sessions held in 2008 observation revealed students were unclear as to what a call number was. In response, in the following sessions, the librarian gave more details as to what a call number was and where to find it. Facilitators are able to help the students through these activities, identify where they are struggling and then report any observation or needed changes to the librarian.

4.3 Quiz

Quizzes can be a successful way to test engineering students knowledge of library resources and to get them involved in information literacy sessions [5]. Since 2003 a quiz has been a standard activity. The students are asked to answer a few short questions about library resources to win a prize. From 2003 to 2009 all four labs competed against each other with one lab the overall winner. In 2010 the activity was changed and now each lab runs its own competition and awards one team a prize. This change increased student involvement and enthusiasm as teams were competing against each other and not with an anonymous lab. The activity also encourages more direct interaction between library facilitators and student teams.

4.4 Twitter and Defining a Topic

To further the development of the library session and to increase student engagement with the material, in 2010, the librarian explored using new social media tools. One learning activity students complete is to define a topic. This activity is done as a group with the librarian in the broadcast booth leading the
students through an example. This year’s example was:

As an engineer with a construction company you have been asked to head down to Haiti to help rebuild. Before you go you need background information about the country and specifically why so many new structures collapsed or were damaged. What are some keywords you would use to search? Where would you look for information?

This activity encourages discussion throughout all four labs. Prior to the sessions Twitter accounts were created for each lab and all were set to follow the engineering librarians Twitter account. Students could see both the discussion topic and the librarians Twitter account on their monitors. Each lab was asked to “tweet” in suggested keywords on the topic and where they would look for information. While the tweets rolled in the librarian would comment on the suggestions. From 2003 to 2009 the method for this shared discussion involved the students verbally making suggestions, the librarian typing them into a blank PowerPoint slide and projecting this to student monitors. Using Twitter not only streamlined this process but it also created a positive student reaction. When it appeared on their screens the comments were encouraging. They ranged from “Oh we get to use Twitter today YES!” to “Twitter…Sick”.

5 Course redesign

Currently ENGG 251/253 is being redesigned. It will now be one term, rather than two, with less lab time and more lecture time. The class will still have a team of instructors and there will likely still be an information literacy component to the class but it will be very focused on point of need in the process of working on the students’ project. There will be less time spent on the mechanics of navigating library resources and more time on the process of evaluating information. An alternative to running a 1.5 hour long session is to have the librarian come into the labs for short 15 minute overview of skills or processes that directly relate to the students projects. Possible positive outcomes to changing the structure include helping to embed the librarian in the course, save staff time and provide support for student learning throughout the entire semester.

6 Lessons Learned

Over the years and through the evolution of this information literacy session we have learned many lessons.

- By using tools like LibGuides to create an entire research skills guide we were able to explore topics in more depth.
- While knowing the mechanics of how the library works is important, learning activities relevant to the learning objectives need to be developed and include an emphasis on critical thinking and analysis of material.
- More assessment of the information literacy session is needed. Currently relying on anecdotal feedback is not as reliable as a pre and post test to assess student learning.
- It is important to have hands on learning activities that are meaningful and just as important to have some face to face time with students to assess the effectiveness of the activities.
- When dealing with large classes tools like Twitter can be used for a variety of purposes including engaging the students and encouraging discussion.
- In order to be responsive to faculty and student needs and expectations the library needs to be flexible in how it delivers information literacy instruction.

7 Conclusion

This information literacy session will continue to evolve as outcomes and expectations for students change. While dealing with large classes is challenging exploring new technologies and using tools like Twitter can assist with engaging students. As we move forward with this class we hope to use our lessons learned to modify our sessions and enhanced the undergraduate engineering students’ learning experience.
7.1 References


