

Reengineering information skills: librarians' progression towards collaborative learning

Loretta Atkinson

University of Queensland, Brisbane, Australia
l.atkinson@library.uq.edu.au

Lucy Peachey

University of Queensland, Brisbane, Australia
l.peachey@library.uq.edu.au

Leith Woodall

University of Queensland, Brisbane, Australia
l.woodall@library.uq.edu.au

Abstract: *The Liaison Librarians at the Dorothy Hill Physical Sciences and Engineering (DHPSE) Library at The University of Queensland (UQ) have a long and established history of delivering information skills to first year engineering students. This year saw the librarians use The University of Queensland's Collaborative Learning Centre (CLC) for the first time. Previously it had been problematic to engage and involve the large numbers of students enrolled in the course. The use of the CLC was seen as an opportunity to accommodate and deliver to students in a new and different way. Students were able to participate in hands on activities which had not been possible in previous years. As the first librarians at UQ to utilise the centre, this initiated the emergence of original techniques to engage students in information skills.*

The CLC is a state-of-the-art facility which provides an online collaborative learning environment. The delivery of the session in this environment allowed the Librarians to make use of an array of learning technologies that engaged the students and provided for different learning styles. The facilities provided encourage individual and group activity using computers, document cameras, pod mode learning and verbal interaction. The pod mode activities were shared with the entire room through the projection facilities. The information skills session conducted in this interactive and collaborative learning environment was beneficial to trainers and students alike. The evolving nature of the information skills component of the course and the impact of the CLC, and future developments will be discussed.

Keywords: *information literacy, collaborative learning, first year engineering students*

Introduction

Students want their university experience to be interesting (Game and Metcalfe, 2003), and this impacts on the information skills classes that are delivered to them. Since 1995 the Librarians at the Dorothy Hill Physical Sciences and Engineering Library at The University of Queensland

have run information skills sessions for first year engineering students enrolled in *Introduction to Professional Engineering* (ENGG1000). This year saw the use of the Collaborative Learning Centre (CLC) to present the sessions. This Centre is a state-of-the-art learning space which encourages learning in different ways. It provides facilities such as videoconferencing, touch screens, digital cameras, and learning pods (UQ opens state-of-the-art learning centre, 2005). The CLC enables information skills sessions to be conducted in an interactive and collaborative learning environment. In order to understand the impact of a facility such as the CLC, and future developments for the information skills, we need to discuss the structure of the course and the desired learning outcomes.

Background to ENGG1000

First year engineering students at The University of Queensland are all required to enrol in the course *Introduction to Professional Engineering* (ENGG1000). They can not graduate until they have completed this course. The aim of the course is to introduce students to the required skills they will need to be a professional engineer. This course has constantly been reviewed since its introduction, and further changes and developments are expected to take place in the future.

ENGG1000 is a problem-based learning course. It requires students to work and report on an engineering project of which there were 8 topics on offer in 2006. The project topics covered the span of engineering disciplines with a number of the projects based on real community development scenarios. In 2006 the project topics offered to the students were:

- Provision of appropriate electric power supply for the small village of Kamenasa in Timor Leste
- Robot racing
- Water farming for the small village of Kamenasa in Timor Leste
- Engineering computer games
- Energy generation in a minerals operation
- Design of opencut coal overburden removal
- Weather satellite image receiving and decoding

The students signed up to one of the projects, and within each project team they were broken up into groups of 3-6 students. Each project team had an academic team leader from one of the disciplines of engineering, and several tutors to facilitate during the tutorials. Each of the teams submitted a team project report along with a project log book and peer assessment form. In order to do this, students needed to research various engineering resources. The information skills session was to assist in meeting those needs.

Collaborative Learning and the CLC

In 2006 the Librarians were given the opportunity to use the CLC for delivering their information skills classes for the first time. Collaborative learning, as the concept suggests, involved small groups working towards a common goal. This learning environment encouraged active learning thereby further engaging and motivating students. Learners are given a purposeful task which involves teamwork, problem-solving and critical thinking. It was decided that the Librarians would make use of the CLC to deliver the information skills sessions. The sessions would be conducted in an interactive environment involving student participation. Students would work

together in groups and share information. This would complement the structure of ENGG1000 being a problem-based course. The CLC facilities offered an environment for supporting collaborative learning. Students were able to work in small groups when the room was in pod mode. Projection screens dropped from the ceiling and temporary walls divided the room into five separate learning environments (pods). They were then able to share their work with other groups by making use of the document cameras to project their work to presentation screens throughout the room. Students benefit from participating and being interactive in the learning process (McKinney, 2006).

Librarians role in ENGG1000

The Library runs information skills classes to enable students to find information they require for their projects and prepare them for the additional assessment which is set and marked by Librarians. Traditionally the information skills training consisted of a 50 minute tutorial and a one hour lecture. In 2006, the lecture mode was abandoned as part of the changes to ENGG1000. Only a one hour tutorial was delivered to students.

Student enrolments have steadily increased in engineering over the last few years, from 435 first year enrolments in 1995 (The University of Queensland, 1995, p. 8) to close to 800 in 2006, therefore the delivery of the library tutorials had to be changed. Previously information skills classes were delivered over three weeks during laboratory time. Students were given a choice of times and were required to attend one library tutorial. More recently the classes were held during their allocated Week 5 tutorial times. The information skills classes were offered 14 times, and ten of these classes were delivered in the CLC.

The information skills sessions covered how to use the library catalogue, searching Compendex - a comprehensive engineering database, an awareness of plagiarism and skills in citing and using citation styles. By the end of the session it was expected that students would be able to:

- search the library catalogue to find information (e.g. books)
- search Compendex (engineering database) to find information (e.g. journal articles, conference papers, etc)
- be aware of some services provided by the library
- know why to cite information
- know how to cite the information

Proficiency in information skills is important to undergraduate students as they provide them with skills required for their university education and beyond. The integrated information skills session in ENGG1000 is highly valued by the Librarians and the Faculty alike. This integrated approach is conducted by other libraries at universities which have seen the value of this such as Deakin University. Deakin University, like UQ, assesses the information skills component. It is understood that teaching information skills is important for first year students as it equips them with vital skills for learning at university (Tucker and Palmer, 2004).

The information skills classes in the CLC consisted initially of a PowerPoint presentation. During the presentation verbal and written responses to questions were encouraged. Written responses from students were flashed around the room using the document camera from the lectern. The Librarian delivering the session demonstrated searching the library catalogue and

databases. Students then participated in small groups by using computers to perform catalogue and databases searches. The CLC was also used in pod mode and students worked in groups to respond to citation examples presented on the screen. A hands-on exercise was provided to small groups of students to construct a bibliographic reference from a selection of possibilities, in the form of a jigsaw. Students were required to put the reference together in the Harvard style using the citation handout given to them at the beginning of the session as a guide.

Assessment and marking

The information skills session was assessed as part of the *Introduction to Professional Engineering* (ENGG1000) course and was worth 7.5%. There were three parts involved in the assessment. Part A required the students to look for references using the library catalogue, databases and the Internet. Students were to take note of all of the publishing details required for referencing. Part B asked the students to produce a bibliography of the ten items they found in Part A using the Harvard citation style. In Part C the students had to complete two in-text citations used in the body of a written work.

This assessment was marked using three separate criteria accounting for each part of the assignment. The purpose of the assessment was to ensure that students were equipped with information searching and referencing skills, and the knowledge to compile bibliographies. These skills would be relevant to their future engineering studies. The Liaison Librarians in the Dorothy Hill Physical Sciences and Engineering Library marked this component of the assessment.

Impact of the CLC

The use of the CLC made a definite impact on the delivery of the information skills in 2006. The impacts resulted in more interactive learning which allowed the students to participate in hands-on activities. Students had access to workstations which allowed them to perform searching exercises on the library catalogue and databases. This had not always been possible in the information skills sessions run in prior years. Due to the large numbers of students, sessions were often needed to be held in the Library Conference Room where Librarians were left to demonstrate exercises involving the library catalogue and databases. This was not an adequate training environment and attention was turned towards making use of the CLC.

The Librarians attended a training session called Introduction to Training to Teach in the CLC during planning for ENGG1000. After attending this session, Librarians saw merit in making use of a number of features in the CLC in order to deliver their information skills session. The major effect of the CLC was engaging students in interactive learning. This was made possible by the interactive features available in the CLC. Students were engaged in a number of ways throughout the information skills session which was not previously possible in the training rooms used prior to 2006.

Firstly, the use of the CLC allowed a greater number of students to attend the information skills sessions at any one time. The training rooms previously used accommodated a much smaller number of students thereby increasing the workload of the librarians. The CLC allowed the

librarians to communicate with larger groups of students and also to use the tools available in the CLC to engage them in small groups.

The equipment available in the CLC encourages group and interactive learning. The teaching spaces used by the Librarians for the information skills sessions accommodated 90 students at any one time. The facilities available include 42 workstations, lectern microphone and PA system, instructor computer, VHS/DVD player, automatic deployment of projection screens, Internet and UQ network connection. There is also plenty of desk space in the room due to deliberately installing less workstations than seating. This allowed the Librarians to give an interactive task to the students in the form of a jigsaw. The layout of the room facilitated this and allowed students to be actively involved.

The 42 workstations in the CLC are arranged in five areas called pods. By utilising the touch screen controller, the rooms can be automatically configured into three distinct learning modes: individual, seminar, and pod (or collaborative group) mode. The pod mode activates blinds and screens to physically divide the room into five “break-out spaces” (pods). During the information skills sessions the Librarians used the pod mode to allow the students to form discussion groups. Students were more inclined to talk in the smaller groups rather than when the room was in seminar mode.

The CLC also provides document cameras in the five pod spaces. During the information skills sessions this allowed the students to share work with students in other pods. Students were able to project the results of their jigsaw puzzle references around the room. The document camera at the lectern also allowed the librarians to project results to the various pods throughout the CLC.

The pods were an asset to the librarians in delivering the information skills. While trying to reach a large number of students during each session, the pods allowed the librarians and tutors to interact with smaller groups of students. This further encouraged students to engage in active discussion which may have prevented this happening in the larger context.

Although the use of the CLC saw a great improvement in the delivery of the information skills there were still a number of pitfalls and there is room for further progress in the future.

Looking towards the future

The information skills sessions made general use of the CLC which was an innovation this year. Library staff commented that they received fewer than ever queries regarding the assignment compared to previous years. However, the CLC was not used to its full potential and as a result there are a number of improvements that can be made in the future.

The planned mode of delivery was successful in many of the sessions delivered in the CLC but not all. This was due to a number of reasons. The size of the groups in several sessions reached and overran the capacity of the room. Time constraints played a considerable role in the effective delivery of the information skills. There was a lot of information to impart to the students in a 50 minute session. Making use of the collaborative facilities further highlighted this issue. The pod mode was found to be ineffective in several of the sessions in the cases, notably when the tutors did not show up. Tutors were asked to attend the library sessions with their students, and when

they were absent the Librarians were required to move between pods to facilitate discussion. The Librarians also did not make full use of the learning technologies in the CLC as well as they could have. Students were not fully engaged in the sessions and many showed signs of boredom and lack of interest during the classes. Many students were excluded from practical exercises on the computers because they were under 18 years of age. This could have been overcome by having an Under 18 Consent Form signed prior to attending the class. The Telecommunications Act 1997 and the Broadcasting Services (Online Services) Act 1999 prohibit the University from providing unsupervised access to the Internet to anyone under the age of 18 without evidence of consent by their parent or legal guardian. In the future the Librarians could play an active role in arranging for this to be put in place prior to the information skills session.

One of the ways to improve the information skills classes is to consider the introduction of a problem-based learning (PBL) activity to better engage the students. This would also align with the problem-based learning theme of the overall first year engineering course. Other advantages of using an active learning model include:

- Engaging and motivating the students (Biggs, 2003, p. 234)
- Exploring (Yeo, 2005) and developing new ideas on using information resources
- Using their own learning style to find information (Carder, Willingham, and Bibb, 2001) and not just the methods that Librarians think are best
- Developing skills to critically analyse the information

Carder, Willingham and Bibb (2001) suggest that problem-based learning should only be for students who have had “an orientation to the library”. As there is only one hour contact with these first year students, providing them with instruction on using the library resources and incorporating a problem-based activity would not be possible. As an alternative, providing the students with online tutorials covering use of the library catalogue and databases to view prior to the class is one solution. These online tutorials will enable the student to enhance their own knowledge of using information resources (Carder, Willingham and Bibb, 2001, p. 183) thus hopefully accommodating their prior experience. We will seek funding to make available all required online resources on a CD which will be given to the students during the Week one lecture for ENGG1000 and made available for loan from the library. The CD would include all online library resources required and other resources such as the Under 18 Consent Form for accessing the Internet.

Once students have completed the online tutorial they would then attend the information skills session presented by the Librarians. It would then be possible for the class to perform a PBL exercise which would be more engaging for the student and make the learning of information skills more relevant. The CLC facility would allow for the students to be divided into their project teams. Librarians and tutors could work between the groups and act as facilitators allowing each team to find and list appropriate information resources. They could also encourage the students to critically evaluate the information they have found. The students could work collaboratively and then report back to the main group with their findings, using the document cameras and projection facilities within the pod in the CLC.

The PBL exercise would assist in meeting the objectives for the course. Students could use the library’s electronic resources to find appropriate information, identify the different types of

resources sourced and evaluate their usefulness. Putting it into the context of a problem will also help the students to understand the usefulness of the library workshop.

The marking of the assessment also presented issues that need to be addressed in the future. The marking brought out some of the difficulties students were experiencing with answering the questions put to them. Students struggled with identifying the publishing details of a website. They also had problems with the format of an in-text citation. Librarians may need to spend more time or use another method of instruction to ensure that this learning outcome is successfully achieved in future training sessions. As a vital component in the information skills these issues will need to be addressed in forward planning.

Liaison Librarians have also identified that the time involved in physically marking up to 800 assignments added considerably to their normal workload. This year the Librarians investigated electronic submission of the assignments and using a merge and compare method of marking. This method was not viable due to the number of variables involved. The use of an online tutorial may assist in addressing this issue in the future. The marking criteria will also need to be addressed as there was little spread in marks between an excellent assignment as opposed to an average assignment. The criteria will also be altered in the future in order to provide an improved overview of the students' results.

The increase in enrolment numbers of first year engineering students at the University of Queensland has also been discussed. These numbers are expected to continue to grow in the future due to industry demand (UQ boosts 2006 Engineering intake in response to industry demand, 2005). This will continue to have a great impact on the mode of delivery of the information skills to the first year students, so finding a feasible and successful method and approach will be critical to the continuation of our partnership with the School of Engineering.

Conclusion

The use of the CLC has made a positive contribution to the information skills classes taught in 2006. The use of the Centre allowed the Librarians to reconsider the content of the sessions and gave us the opportunity to experiment with a variety of delivery methods that would have appealed to the students' different learning styles. Having established this there is still much that can be done to improve the sessions and make greater use of the CLC facilities.

It is important for the Librarians to continue to seek improvements in delivering the information skills sessions. We are aware that the information skills classes will continue to evolve and the modifications will be incorporated into planning for 2007. This includes the possibility of using a PBL exercise and providing materials, either on CD or integrated into the ENGG1000 website, to students. These options will be considered in the forward planning.

The CLC will continue to be used in the future, employing new methods and ideas to appeal to the different leaning styles of students and thereby contributing to the education of engineering students at The University of Queensland.

References

- Biggs, J. (2003). *Teaching for quality learning at university: what the student does*, 2nd ed, Philadelphia, Pa: Society for Research into Higher Education and Open University Press.
- Carder, L., Willingham, P., & Bibb, D. (2001). Case-based, problem-based learning: information literacy for the real world, *Research Strategies*, 18(3), 181-190.
- Game, A., & Metcalfe, A. (2003). *The first year experience: start, stay, succeed at uni*, Annandale, NSW: Federation Press.
- McKinney, K. (2006). Active Learning, *Center for Teaching, Learning & Technology*. Retrieved July 20, 2006, from <http://www.cat.ilstu.edu/additional/tips/newActive.php>
- Tucker, B., & Palmer, S. (2004). *Integration of information literacy training into engineering and technology education*. Paper presented at the 2004 VALA Biennial Conference and Exhibition. Retrieved August 30, 2006, from <http://www.vala.org.au/vala2004/2004pdfs/36TucPal.PDF#search=%22integration%20of%20information%20literacy%20training%20into%20engineering%20and%20technology%22>
- The University of Queensland., (1995). *Statistics*, Brisbane, QLD: The University of Queensland.
- UQ boosts 2006 Engineering intake in response to industry demand, (2005. October 7). *UQ News*, Article no. 8033. Retrieved July 10, 2006, from <http://www.uq.edu.au/news/index.html?article=8033>
- UQ opens state-of-the-art learning centre, (2005, May 20). *UQ News*, Article no. 7163. Retrieved July 10, 2006, from <http://www.uq.edu.au/news/index.html?article=7163>
- Yeo, R.K. (2005). Problem-based learning in tertiary education: teaching old “dogs” new tricks?, *Education and Training*, 47(7), 506-518.