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USING AN ONLINE DATABASE SEARCHING TUTORIAL
TO ENCOURAGE REFLECTION ON THE RESEARCH
PROCESS BY UNDERGRADUATE STUDENTS

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Abstract
In 2003, Education Liaison Librarians designed and implemented an online database searching
tutorial for students in a core third year Queensland University of Technology Bachelor of
Education undergraduate unit. This was intended to promote reflection on the scholarly research
process in undergraduate students. Impetus for the tutorial came from academic staff, librarians
and student feedback. This indicated that students experienced difficulty in distinguishing between
scholarly and non-scholarly sources of information. In addition, students had problems
constructing and implementing effective searches.

This paper outlines the actual design process, including the choice of technologies appropriate for
a range of learning styles. It highlights the collaborative nature of such initiatives and discusses
the issues involved in implementation, ongoing evaluation and modification. A significant benefit
of the project has been the interest it has generated as a useful model among other QUT academic
staff and liaison librarians.

Keywords
Information literacy, active learning, adult learners, online learning,
learning styles, collaboration, online tutorial, design process, undergraduate
students

Introduction
In 2002, a project team of librarians and academic staff made a successful bid for a Queensland
University of Technology (QUT) Faculty of Education Strategic Initiative grant. The project was
called “An Information Literacy Tutorial for Multi-Modal Learning”.

The desired outcomes for the project were stated in the original grant documentation:

- development of a multi-modal, interactive tutorial to facilitate the learning of information
  literacy skills for a specific assignment;
- a tutorial made of a series of discrete components that can be rearranged and altered for
  use in different contexts, and as environmental factors change, thus decreasing costs over
  time;
- tutorial design to be appropriate for a range of learning styles;
- tutorial design to enable use in other unit contexts with minimal changes required;
- demonstrable embedding of Teacher Practitioner Attributes within a BEd unit;
- ready applicability across a range of Faculty courses;
- able to be adjusted to enhance research training at both preservice and postgraduate levels
  and
- incorporation of part of the QUT Information Literacy Framework and Syllabus.
(Project Team, 2002, p.2)
The desired student learning outcomes of the project were mapped to the University’s “Information Literacy Framework and Syllabus”. The relevant core student learning outcomes, as stated in the QUT Framework and Syllabus, were:

- have knowledge of, and understand, information principles and information retrieval processes;
- access and use effectively a wide range of information resources and technologies;
- apply information seeking and usage principles.

(Queensland University of Technology Library, 2001, p.15)

In 2001, QUT’s Information Literacy Framework and Syllabus, based on the Australian and New Zealand Information Literacy Framework (Bundy, 2004), was endorsed as University policy. This provided institutional support for liaison librarians to work with academic staff to ensure that information literacy becomes an integrated and assessable part of the curriculum. By 2002, the QUT Faculty of Education had reconceptualised the Bachelor of Education (BEd) degree and Education liaison librarians were collaborating with academic staff to embed information literacy in the new units.

A core third year unit in the original BEd, titled the Psychology of Learning and Teaching (SPB002), was chosen as a pilot study for the project. The need to promote student reflection on the scholarly research process was clearly evident from comments and observations received from academic staff, librarians and students. This feedback revealed that undergraduates preferred electronic sources of information, but experienced difficulty distinguishing between scholarly and non-scholarly sources of information. However, students appeared to experience the greatest difficulty with the construction and implementation of effective search strategies. In previous semester offerings of SPB002, students received one 45 minute lecture early in the semester, on the process of locating scholarly information. The largely transmissive mode of the lecture offered limited opportunities to be actively involved in or to receive feedback on the research process. Feedback from academic staff regarding the quality of student Fieldwork Reports indicated that some students were adopting a surface approach to the process of searching, locating and evaluating information. That is – some students did not appear to be meeting the SPB002 desired objective of encouraging students to adopt a deep approach to their own learning and they were not demonstrating the capacity to “gather, form and critique knowledge from a variety of sources…to question and reflect on new information and ideas” (Queensland University of Technology School of Learning and Professional Studies, 2003, p.3)

The teaching and learning project commenced in 2003 with the design and implementation of an online database searching tutorial by Education Liaison Librarians, working in collaboration with academic and TALSS (QUT Teaching and Learning Support Services) staff. The tutorial, together with an assessment item, was designed, implemented, evaluated and modified in Semester 2 of that year. In the longer term, the aim was to then embed the information literacy initiative into the new core second year unit (EDB002) in the reconceptualised BEd, for Semester 1, 2004. This teaching and learning project followed an action learning cycle of planning, implementation, evaluation and reflection. Formal and informal evaluation in the SPB002 unit resulted in modifications which in turn were introduced in EDB002 in the next action learning cycle. This paper focuses on the SPB002 unit with a brief discussion of the EDB002 unit.

**Method**

A literature review and survey of appropriate, available technologies was conducted before commencing the design process. This review informed the design and evaluation stages, with particular reference to the work of Biggs. Biggs believes that the major reason that students adopt a surface approach to learning is a lack of alignment with the curriculum and learning objectives. He (Biggs, 1999, p. 63-64) outlines three steps for teachers who want to pursue a student-centered approach to teaching and learning, calling them a network of “constructive alignment”, with the curriculum objectives at the centre. His recommended steps are to specify desired outcomes and learning objectives, to use criterion referencing for assessment tasks and to choose appropriate learning activities. These were taken into account in the design of the online tutorial.
**Content**

The content of the online tutorial was derived from a variety of sources, including discussions with unit coordinators, tutors and liaison librarians, a summary of answers to student questions following on from the Semester 1 lecture, as well as a review of the study guide. Several other academic online tutorials were investigated, in addition to existing QUT library and SPB002 resources which could be linked to the new tutorial. Notably, relevant content was adapted from an online psychology tutorial from Central Queensland University Library (Central Queensland University Library, 2002).

The QUT SPB002 online database searching tutorial was designed to assist students in locating and evaluating scholarly journal articles and through reflection, to develop a better understanding of the research process. The tutorial comprised four modules: Understanding Journals, Planning a Search, Searching for Journal Articles, and Evaluating and Referencing Journal Articles (Figure 1). The tutorial learning activities were designed to model the desired processes for students to follow when conducting the research for their Fieldwork Report. Although the tutorial layout presented the research process as a linear one, the content and the Worksheet steps reinforced the need for reassessment and reflection on the research process. Emphasis on the recursive nature of the research process is an important one, as it can attempt to alleviate student frustration with their initial searching failures (Caspers, 1999).

**Tutorial Structure**

Each of the modules within the tutorial had a specific set of stated student learning outcomes. These followed D’Andrea’s (2003) key criteria for designing well-written learning outcomes. The student learning outcomes were written in the future tense, designed to be achievable and assessable, used minimal jargon and identified important learning requirements. Although the tutorial was self-paced and users could navigate backwards and forwards between modules, the tutorial did have a narrative structure, which was reinforced by the Worksheet. The need for a clear narrative structure in an interactive multimedia learning environment is reinforced by Laurillard’s (1998) discussion of research findings which demonstrate that learners’ comprehension can be adversely affected by the lack of one, leading to learning behaviour that is generally unfocused and inconclusive.
Design Guidelines
Among the 350 internal undergraduate students enrolled in SPB002 in Semester 2, 2003 there was a considerable variety of ages, life experience and learning styles. The online tutorial was designed to address a range of learning styles and to provide opportunities for active learning. Examples of techniques used to address different learning styles were: audio clip, visual images (e.g. snapshots of database searches), multiple choice quizzes, “test yourself” activities (Figure 2) and the linear design of the tutorial which also incorporated a self paced option for progression through the tutorial.

![Module 1: Evaluation & Referencing Journal Entry](image)

**Test Yourself**
Using the Library’s guide [referencing using APA style](note) see if you can work out how to reference the following journal articles. Each article has a link to an example answer.

- Article One
- Article Two
- Article Three

Note: These articles were taken from a search on the “mozart effect” using the ERIC and PsychInfo databases.

![Figure 2 Module 4 – “Test Yourself” section](image)

The online tutorial needed to function as an effective learning tool with only minimal support by liaison librarians. The Online Learning Technology (OLT) interface was chosen for the tutorial for a number of practical reasons. These included its existing use for SPB002, student familiarity with the interface, institutional support and training, lack of available web authoring software and the multiple choice quiz functionality.

After consultations with an instructional designer from TALSS, the following design guidelines were applied:

- student outcomes were stated for each module;
- the focus of the first iteration was on the content rather than the technology;
- opportunities for active learning were provided – and each step in the Worksheet was embedded in the tutorial;
- formative feedback was provided through the use of multiple choice quizzes and “click here” examples;
- jargon was kept to a minimum and was defined where relevant;
- the same worked example was used throughout the tutorial;
- graphics were relevant and small;
- the tutorial was tested before being launched and
- an audio clip was used as an alternative introduction in the tutorial.

Assessment
The importance of linking learning activities with assessment is emphasized by Ramsden who believes that “from our students’ point of view, the assessment always defines the actual curriculum” (1992 p.187). The assessment component for the online tutorial was essentially summative. Students were required to print out the Worksheet and to write their answers to the questions on that sheet as they worked through the tutorial. Each question was embedded in a module and focused on the student’s Fieldwork topic. The Worksheet was allocated 2% of the total semester’s marks to emphasise the importance of the learning activity to students and to encourage them to complete the tutorial. Criterion referencing was applied to the Worksheet and was designed by the unit coordinator, in consultation with the liaison librarian. The criteria were explicitly stated in the SPB002 Study Guide, in the same way as for other assessment items, and the Worksheets were marked by the tutors.
When introducing innovative assessment, it is essential that both students and teaching staff have a clear understanding of the assessment criteria, and that the assessment criteria themselves exist within a clear framework (McDowell & Sambell, 1999). The liaison librarian introduced the assessment requirements and the desired student learning outcomes to students and staff early in Semester 2, 2003. After an orientation meeting with tutors, the tutorial was introduced to the students in a joint lecture in Week 2, Semester 2, 2003, and a direct link was made to the online tutorial from the SPB002 OLT site.

**Potential Barriers to Implementation**

There were limitations and potential difficulties associated with the implementation of the online tutorial:

- some students were away on practicum in the first six weeks of semester and missed the joint lecture;
- although the liaison librarian was available to be contacted by tutors and students, there were not the staff resources available to cope with large numbers of individual consultations;
- the liaison librarian went on a year’s leave commencing in semester 2, 2003 and a series of liaison librarians acted as a replacement and
- limitations of the OLT technology – for example, a customised navigation bar was not available.

**Evaluation**

In this paper, the evaluation and results sections will focus primarily on the SPB002 unit. Data was collected in a number of ways in order to evaluate the success of the online tutorial in meeting its teaching and learning objectives. The data was used to generate recommendations for changes, which were implemented in time for the commencement of EDB002 in 2004. A variety of formal and informal data collection methods were used, and including both formative and summative evaluation. Attempts were made to address issues of validity and effectiveness, through the use of a variety of data collection methods. The issue of validity was also addressed through the application of criterion referencing to the Worksheet. The aim of the criterion referencing was to ensure that the students understood the assessment grading scale and also that performance was measured against standard criteria to ensure consistency.

**Data Collection**

Voluntary student surveys were used as the formal method for obtaining evaluation data. Students were provided with the opportunity to complete two questionnaires anonymously, one online and the other on paper. The template for the online survey (WOLF survey) had already been developed by TALSS staff. With a direct link from the tutorial page, its purpose was to gather information about students’ perceptions of the design of the tutorial immediately after they had completed it. The print based student survey form was designed by the liaison librarian, in conjunction with a TALSS staff member, and used the Flashlight Methodology for evaluation of technology. The Flashlight Methodology follows a five step process whose aim is to “create a meaningful set of questions that help identify the links between the technology used, the learning activity and the learning outcomes” (Coordinated Online Teaching (QUT), 2003, p.1). The student survey was designed to obtain data on students’ perceptions of the role of the online tutorial in facilitating their learning. The survey form was distributed and collected in a catch-up tutorial at the end of semester, after students had received their Fieldwork Report and Worksheet assessment marks and had the time to reflect on their learning experiences.

A number of informal methods of data collection were used. Data was obtained from observations by the liaison librarian, librarians staffing the Information Desk, as well as the SPB002 unit coordinator and tutors, all of whom had received questions and/or comments from students regarding the online tutorial and Worksheet.
Constraints
The constraints in the collection of evaluation data included limited staff resources relative to the large number of students; ethical issues relating to the timing of evaluations; and limited formal contact between the liaison librarian and students. Ethical issues relating to identification of students and their assessment marks were addressed by making the surveys anonymous.

There was also the possibility of a “halo effect” occurring, where students rate the learning experience overall positively or negatively because they had just completed it, or had been given insufficient time to complete the questionnaire. Feeley (2002) suggests methods to combat this effect, which were adopted. These were to use concrete, specific, and clear categories to assess instruction, to explain to students the importance of the student evaluation forms and to offer them enough time to complete them. In addition, the WOLF questionnaire and the print student survey were used.

Results and Discussion

SPB002 Survey Results
As the response rates were low (18% for the print student survey and 7% for the WOLF survey), the analysis of the results cannot be used to generalise for the broader general student group. However the results indicated certain trends, and as this project was intended as a pilot study, further evaluation was undertaken in the next iteration of the tutorial, in EDB002. Factors which might have contributed to the low response rate to the surveys were that the request came from the librarian and not a lecturer or tutor, that students were studying for exams during the student survey period and that the role of the feedback was not well understood by the students.

The results of both SPB002 surveys were combined and reported in three main areas - site structure, content and learning outcomes. The majority of the student survey respondents indicated that they were satisfied with issues relating to the site structure. In general, respondents thought the content was appropriate, although some were confused by the terminology used in the search section of the tutorial and others considered that the content would have been more relevant in earlier units of their degree. This data was not altogether unexpected as the tutorial was a pilot project. It was also a validation of the intention to implement the tutorial in the new core second year unit, EDB002, in 2004.

In terms of the learning outcomes, a few respondents did not complete all of the modules, and again this was not unexpected, as the tutorial had been designed to be self-paced in order for students to exercise some control over their own learning. The majority of respondents used the evaluation criteria to evaluate the relevance of the journal articles, and also thought that the learning objectives were clearly stated. The questions which rated the highest levels of disagreement were the ones relating to constructing an effective search strategy and locating relevant articles. Comments indicated that reasons for this could be lack of understanding of the topic, poor explanation of the search strategy in the tutorial, and students performing searches before undertaking the tutorial.

“The search strategy term confused me as it was never properly explained and I did not realise that it referred to the words you actually typed into the search.”

“I found journal articles on my own by trial and error long before I did the tutorial.”

In sharp contrast are the responses when students were asked if they agreed that they would be able to apply the skills learnt from the tutorial to other areas of their studies.

“The tutorial was great it made me begin my researching at an earlier time and helped me pinpoint what I needed to find.”

“This was very helpful for the assignment but also for other subjects. It would have been much better though if it was in first semester rather than second and at the beginning of the degree it would have been much more helpful.”
“I think that this activity worked well and did actually make me think about what I was writing or researching for my fieldwork. The idea of being able to do some of it and then come back to it really was a great idea.”

(J. Logan, personal communication, 7 November, 2003)

**Feedback from Teaching Staff**

Informal feedback was received from the unit coordinators (SPB001, SPB002 and future EDB002), tutors and Education liaison librarians. This indicated that the majority of students performed well in their completion of the Worksheets.

Feedback from the unit coordinators reflected the following concerns:

- need to clarify sections on the Worksheets referring to the evaluation criteria and referencing style;
- although the unit coordinators were supportive of the tutorial, they emphasised that it was important to ensure that the tutorial did not become an assessable item in more than one unit, in order to prevent duplication.

**Modifications and Further Iterations**

In consultation with academic and TALSS staff, minor modifications to the tutorial and Worksheet were made. The online tutorial and Database Searching Worksheet were implemented in the new EDB002 unit in Semester 1, 2004 and the Worksheet was allocated 3 marks. The same data collection and evaluation process was used for EDB002 and the data is still being analysed. In addition, a survey of a sample of 70 of the Database Searching Worksheet was undertaken by the Education liaison librarians. Analysis of the most recent data is revealing that the major source of difference between the two student cohorts is that many of the EDB002 students appear to have completed the tutorial after completing their Fieldwork Report. Unlike the SPB002 students, the EDB002 students had not had the same reinforcement during lecture time of the role of the tutorial and worksheet and although drop-in library information sessions were offered, they were not well attended. The opportunity to view the assessment item was extremely important as it demonstrated to the liaison librarians that even though some students completed the tutorial and Worksheet after they had done their Fieldwork Reports, the majority of the students still concurred that the skills and knowledge were valuable and transferable to other units. Ongoing communication between the liaison librarians and unit coordinator is aimed at emphasising the role and importance of the online database searching tutorial and Worksheet in future EDB002 semester offerings.

The online database searching tutorial has proved its effectiveness and has now been used as a model by other QUT liaison librarians and academic staff - an Early Childhood unit in Singapore and a Performance unit in the new Creative Industries precinct. The relevant liaison librarians are collaborating with academic and TALSS staff to customize the tutorial for their own students. Other liaison librarians and academic staff have also expressed interest in the tutorial and Worksheet. It is expected that each implementation of the tutorial will involve a cycle of innovation and ongoing modification.

**Conclusion**

The evaluation of whether deep learning has taken place is still problematic, although it is obvious that students are motivated by assessment and do value the opportunity for active learning and reflection. In order for an information literacy intervention to achieve its objectives, effective communication and collaboration must be maintained between liaison librarians and academic staff. It is vital to continue the action learning cycle of planning, implementation, evaluation and reflection. This project has been successful in addressing many of the stated aims of the Strategic Initiatives bid and interest in the tutorial by other academics and liaison will address the remaining objectives.
References


Project Team. (2002). *Faculty of Education 2002 Strategic Initiative Bid*. Brisbane: QUT.


Acknowledgements

Thanks to the QUT academic staff and students from units SPB002 and EDB002, as well as the Education liaison librarians and TALSS staff who were involved in this project.

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