

PEDAGOGY FIRST, TECHNOLOGY SECOND: TEACHING & LEARNING INFORMATION LITERACY ONLINE

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Abstract

This paper explores the pedagogical and technical issues, challenges and outcomes of creating an online information literacy course. Currently under development, this course will be offered as a parallel study option to Advanced Information Retrieval Skills (AIRS:IFN001¹) for QUT postgraduate students, a compulsory face-to-face course for all QUT research students. The aim of this project is to optimise students' access to AIRS:IFN001 and meet the University's objectives regarding flexible delivery and online teaching. Still in its developmental stages, AIRS::Online² extends beyond the current notion of static online information literacy tutorials by providing a facilitated, student focussed learning environment comprising content and learning experiences enhanced by appropriate multimedia technology and resources which engage students in planned facilitated and/or self-paced learning events. Course assessment is formative and summative, and is comprised of a research log and reflective journal to provide a means for reviewing the content and key process of advanced information searching and retrieval.

Keywords

Information literacy, e-learning, online course development, flexible learning

Introduction

AIRS::Online is an online information literacy course currently under development at Queensland University of Technology (QUT). The newly styled e-learning format uses as its basis the accredited, face-to-face Advanced Information Retrieval Skills (AIRS:IFN001) course, designed in 1989 for the University's postgraduate research community.

In its current format, AIRS:IFN001 aims to assist students in working toward their literature review by assisting them to develop as highly proficient users of information. The curriculum of AIRS:IFN001 includes (i) exploration of postgraduate student library services, search statement designs, including, the use of the various operators and evaluation of information; (ii) database searching and cited reference searching, allowing for demonstration and practice across a range of platforms; (iii) internet searching and tools, which guides students through comparative evaluation-based principles; and (iv) introductory EndNote³ training and current awareness strategies, including saving searches and alert services groups.

In order that AIRS:IFN001 remains relevant to its constituent client base and retains a pre-eminent role in information literacy education at QUT, it has been acknowledged that an on-line presence is now desirable. Thus, the Library is undertaking the development of *AIRS::Online to*

¹ Title denotes course offered in face-to-face mode for on-campus students

² Working title

³ Bibliographic management software produced by ISI ResearchSoft

comprehensively and equitably address the advanced but fluid research and study needs of postgraduate students and staff and to facilitate learning outcomes for students in a changing environment.

While the Library currently provides various resources via its *Information Literacy* website, the OLT⁴ system, and *PILOT: Your Information Navigator*⁵, there is currently no online option available to support the advanced needs of QUT's part-time and distance postgraduate research students. Indeed, from the results of a recent environmental scan and national survey conducted by QUT Library (Fell, 2001), there appears to be no such online postgraduate level course offered by any tertiary institution in Australia.

The *AIRS::Online* project commenced in 2002 with conceptualisation and preliminary development of the online curriculum and technical infrastructure, and development is to continue throughout 2003 and 2004. The production team (comprised of the Information Literacy Coordinator, AIRS Librarian, Liaison Librarian and a Library Systems Officer) is responsible for designing and developing the content, technical infrastructure and learning objects in cooperation with QUT's Web Solutions group and instructional designers in SMILE⁶ unit. Three of the ten modules will be piloted for Semester 1, 2004, the feedback from which will inform the development of the remaining seven modules.

While online learning is becoming more popular with students, institutions are still exploring associated educational theories and pedagogical practices inherent in the process. This paper explores issues relating to the development of *AIRS::Online* as an educationally rigorous course, the content, structure, presentation and delivery of which is enhanced, rather than driven, by effective and appropriate technology. Matters relating to access and learning support are also discussed.

From classroom to e-room

Aspects of theory

In order to create *AIRS::Online* as a pedagogically and technically durable learning tool, development has relied upon a number of critical and cogent theoretical and practical considerations.

AIRS:IFN001 - overview

AIRS:IFN001 is divided into four sessions, each of approximately three hours duration and held once a week over a four-week period. Sessions are conducted during business hours, evenings and occasionally weekends by arrangement and conducted in small computer laboratories with a maximum of 10 students per session. This format ensures each student may work independently, yet interact within the group when required.

AIRS:IFN001 draws upon a range of educational models. Underpinning the course structure is the expository presentation model (Grabowski & Koszalka) in which the facilitator presents subject matter and suggests the direction students take through the session. For example, search protocols associated with databases or search engines are presented and demonstrated, and then applied by students using their own subject areas as the foci of their searching. The facilitator focuses students' attention on the generic attributes of a tool in order that the concepts and skills can be effectively applied across a broad range of tools.

Supporting this model of teaching is the "inquisitory presentation method" (Grabowski & Koszalka) where questioning strategies are used to activate brainstorming by students to provide appropriate answers while guiding the session through feedback and direction. A third model,

⁴ Online Learning and Teaching, QUT's in-house course management system

⁵ A web-based, self-paced online information literacy tutorial for undergraduate students

⁶ Software, Multimedia & Integrated Learning Environments

“problem based learning (PBL)” is used to enhance the development and understanding of rigorous principles of information evaluation. AIRS:IFN001 students are required to investigate web-based information and to assess the credibility of such information. A range of search strategies is provided to assist the students in finding solutions to the problem.

Throughout the AIRS:IFN001 course, a range of visual, auditory and practical experiences have been employed to accommodate differing student learning styles as identified by Bandler and Grinder in Allan (2002). The sessions are taught in workshop format with hands-on searching and evaluation of found materials. As students are encouraged to search for information relating to their particular research interests, the opportunity to practice database and internet searching with expert assistance immediately at hand minimises frustration and maximises results. Following searching, group discussion, is held on the processes that lead to finding particular types of information and evaluation of their results (such as journal articles, conference proceedings and websites). Despite participants often coming from a diverse range of disciplines, the sharing of information regarding the searching process and techniques is a valuable process for learning (Gerhard, Mayr, & Seufert, 2002).

E-learning theory: challenges & opportunities

As Allan (2002) recognises, moving into an e-learning format requires a change in approach to teaching and learning with a critical need to provide visual, auditory, and practical experiences in the form of different learning activities and processes which accommodate a range of different learning styles. For example, online courses should include facts and procedures for sensing learners, and linear and orderly learning experiences for sequential learners. There is also a need to include opportunities for students to socialise as well as work independently, to practise working with new skills and to synthesise and integrate new ideas (Allan, 2002). Online learning experiences should also promote more extensive application of activities that encourage reflection and discussion (Brown & Gibbs, 1996).

E-learning courses inherently demand that students possess a range of technical skills to satisfy course requirements and achieve learning outcomes, and the use of new technology in any course may overwhelm students and raise questions in their minds as to the validity and achievement of outcomes.

The University of Illinois identified ten unique qualities as essential to becoming an effective and productive online student (Illinois Online Network, 2003). These qualities included self-motivation and self-discipline, an ability to communicate through writing and being open minded about sharing life, work, and educational experiences as part of the learning process. Such considerations informed many of the decisions underpinning the development of *AIRS::Online*.

Another significant challenge is that of fostering online learning communities via mechanisms which encourage interactivity, communication and feedback to facilitate individual and group learning. For example, as a university report (University of Illinois, 1999) notes, when implemented well, online discussion can be of a higher quality than that which occurs in a traditional classroom. Shy students may well be more forthcoming, and they can devote more time to thought before comment is made. The report goes on to argue the important role of the facilitator as mediator in this scenario “to compensate for the absence of physical cues” through explicit instructions to students; and “to summarise the state of the discussion and to provide a sense of accomplishment and direction” (ibid, p.28-29). Such outcomes can be achieved using a combination of synchronous (chat sessions) and asynchronous (discussion group and bulletin board) mechanisms.

Aspects of content

The nature of e-learning has demanded a reconceptualisation of the substantive AIRS:IFN001 courseware, and a creative and progressive approach to delivery and support. Fundamentally, all content and design decisions hinge on the development of a course which must provide a comparable student-centred learning experience to that of AIRS:IFN001. Via an extensive

consultative process between the AIRS Librarian, Library Systems staff, graphic designers, web developers and instructional designers, the most effective e-learning elements are subsequently being integrated into the overall design of *AIRS::Online*.

However, the transfer of AIRS:IFN001 into an e-learning environment is raising a number of complex pedagogical, organisational and administrative challenges. Given that the content of AIRS:IFN001 does not readily translate into the online environment, the four course modules are being divided into ten shorter modules in *AIRS::Online* which, together, parallel the content of the face-to-face course. Each module is subsequently being broken down further into smaller learning objects of brief duration to accommodate other issues which arise with reading and learning online. For example, Yin-Sum and Tak-Wing (2002, p.33) report that “reading information from a computer screen can take up to 30 % more time than reading information printed on paper, and learners are frustrated by reading text from a screen”. *AIRS::Online*, therefore, uses compact blocks of text to lead students quickly and easily through the learning process.

Technical aspects

A range of interactive technologies within an intuitive environment was required for *AIRS::Online* to communicate information effectively and to motivate the students to learn and absorb the material.

To assure desired outcomes, close liaison between Library Systems and other QUT technical and design support units was required. Such collaboration is ensuring that the effective and appropriate application of the technology is inherent in the overall design of the course. Decisions to date have encompassed the consideration of the broad and specific online learning environment and have included such aspects as web page design, the incorporation of visually appealing banners and graphics, application of logical navigational elements and the implementation of functional, intuitive menu and file structures.

Another guiding principle in the course construction has been a need for design solutions to incorporate common divisional and institutional standards for web development and accessibility. For instance, module templates are being developed in JSP (in line with other Library web development projects) using the current .jsp web templates and the customary tree layout for navigation. Certain online course functionality (eg. assignment submission) will be utilised in ‘native’ mode on the OLT secure server. Such pages will be branded with customised *AIRS::Online* headers, footers and navigation to complement the look and feel of the *AIRS::Online* site proper, and will be integrated as seamlessly as possible.

Due to staffing and resource issues, the decision was taken to incorporate and utilise tested platforms and applications in the creation of this course, rather than developing in-house solutions. While this approach does introduce certain design constraints, it does provide advantages in terms of collaboration, support, and ongoing maintenance.

While the currency of the content is crucial to the overall credibility of the course and the context in which learning is presented in *AIRS::Online* is subject to ongoing and rapid technological change, the creation of re-useable and readily modified multimedia components was considered a priority. The ongoing maintenance schedule of *AIRS::Online* will be facilitated by the implementation of Macromedia Contribute, a web content creation solution already in use on the Library web site.

Learning Objects and Activities

A primary developmental objective for *AIRS::Online* is to provide a rich web-based learning environment, facilitating synchronous and asynchronous student participation in learning activities. Using common global navigational elements, students thus have ready access to related documentation, tools and support.

The project team is currently testing the use of dedicated software applications such as Dreamweaver and ViewletBuilder to facilitate the creation of visually compelling, animated demonstrations (or ViewLets) which illustrate particular information literacy concepts and provide visual direction and stimulation in student centred, task-based activities. Having completed various activities, the student may then engage in chat or discussion forums or undertake multiple-choice quizzes which provide instant feedback on their level of comprehension.

After assessing varied alternatives, the Library is also collaborating with educational designers in the testing of an Interactive Media Enriched Teaching resource (IMET), the TALSS⁷-SMILE in-house template solution for delivering streaming audio/video elements which is synchronised with text and selected learning activities. These technology enables use of split screens to provide a range of simultaneous stimuli for students from HTML based text, video and audio commentary to Macromedia Flash presentations and a discussion forum. IMET also allows for the presence of a “videoed facilitator” thereby giving a personalised feel to the learning experience.

Communication is being facilitated through a number of technologies. Synchronous chat sessions will be scheduled for set times throughout the duration of each course. Students will also be invited to participate in group discussion forums hosted by a facilitator. Personal email is also an option for students to introduce themselves to the facilitator and their peers, and to ask questions that may arise throughout the course.

Assessment

As recognised by James and McInnis (2001), assessment literally defines the curriculum for most students. By clearly articulating the learning and the reward, assessment becomes a “potent strategic device for educators and a powerful tool for improving the quality of student learning” (ibid).

In designing the assessment of *AIRS::Online* two major objectives were identified. Firstly, *AIRS::Online* had to provide interactive learning experiences appropriate, and of interest, to students of all disciplines. Secondly, the assessment in *AIRS::Online* was required to match the assessment of AIRS:IFN001 in terms of effort, outcomes and output. To achieve this aim, the assessment profile of *AIRS::Online* will comprise formative assessment (quizzes, discussion forum activities and chat) and summative assessment items (Resource Log and Reflective Journal).

The current assessment of AIRS:IFN001, a Resource Paper (weighted at 100%) which directly relates to the research topic of the student, is a collection of resources (electronic or print) reflecting a culmination of the skills learnt in the modules. It meets four main objectives: (i) developed understanding of the key aspects of information searching; (ii) raised awareness of key searching tools within individual research areas; (iii) skills development in resource evaluation and (iv) bibliographic management of the literature.

The design of the assessment of *AIRS::Online* required a review of the AIRS:IFN001 Resource Paper. With a move to an online environment and the subsequent impact upon monitoring of students’ reactions, responses and progress, the allocation of 100% weighting to one single assessment item was deemed as undesirable. Therefore, the *AIRS::Online* equivalent (ie: “Resource Log”) has been assigned an 80% weighting.

Steiner (2001) reported success in using a “Weekly Reflective Diary” in ITB/N322 *Information Resources* (designed by Sylvia Edwards) as an effective formative assessment item. ITB/N322 employs the reflective diary as a means to provide feedback to the lecturer on activities conducted in class and as a gauge of students’ understandings of the content delivered. Formative feedback is provided to students in a timely fashion as they progress through the semester, to aid developmental learning.

⁷ Teaching & Learning Support Services, within the Division of Technology, Information and Learning Support

The format of the “Weekly Reflective Diary” was adopted for *AIRS::Online*. Titled a “Reflective Journal” and with a principal purpose of encouraging reflection upon the course content, the journal has been carefully aligned with the online environment, content level and the technology used in *AIRS::Online*. Specifically the journal will (i) help students to maintain an awareness of how well they are progressing with the content; (ii) provide students with a means to identify any difficulties they may be experiencing in the unit; (iii) assist the facilitator in identifying areas where more help may be needed; and (iv) act as a prompt when students are completing the research log.

The students critically reflect upon set questions presented at the completion of each module at which point a question (or range of questions) designed to promote critical analysis of the module content, will be presented. The ten contributions for the Reflective Journal are intended to be undemanding at a length of only 50-100 words with the assessment items comprising 20% of the overall assessment.

Formative assessment has also been stringently built into the format of *AIRS::Online* to aid the student and facilitator in monitoring progress. In addition, it is essential to address the social and personal needs of students via such assessment. Stubbings and Brine (2003) emphasise that by providing interactive learning experiences, online learning can be very motivating and provides an excellent vehicle for formative feedback. Interactive learning experiences, such as MCQs, discussion forums and facilitated chat sessions, have been incorporated into the design of *AIRS::Online* to address inherent factors of learner isolation. While not weighted, a satisfactory / unsatisfactory rating is ascribed to the students’ attention to this assessment item.

Finally, a third form of assessment - Online Consultation - was incorporated to combat some of the disadvantages of assessing at a distance and in an online environment (Kerka & Wonacott, 2000).. In *AIRS::Online*, synchronous and asynchronous discussion will provide alternative methods of consultation and allow students to regularly communicate with lecturer and peers at prescribed times throughout the course. Discussion forums will be used as both a source of information and a forum for exchange of views between students and lecturer, while Internet Relay Chat (IRC) will provide the opportunity for students to communicate in real time with their lecturer and colleagues. The online consultation seeks to encourage active discussion between students and the facilitator and develop each cohort as a “learning community”.

Other Considerations

Development and design work is being undertaken on a secure Library server; however, in the longer term it is anticipated that *AIRS::Online* will be hosted on the central institutional web server. This decision is in keeping with the migration of the Library public web site to the central server undertaken in late 2002. It is anticipated that most security requirements (regarding student records, assignment submissions, etc.) will be resolved by integrating with the OLT secure server. A test OLT site is being developed for this purpose.

At this stage, it is difficult to gauge how the facilitator’s workload will be affected overall as *AIRS::Online* develops. Currently, the AIRS Librarian is responsible for the course in all its facets including development, administration, teaching and evaluation, duties which constitute a standard fulltime workload. However, as the online program will extend the duties of the AIRS Librarian in terms of the continuing development, facilitation of the teaching program, and ongoing maintenance, there may well be ongoing staffing implications to be addressed.

In addition to issues of workload are considerations of sustainability. Issues relating to the availability of adequate and ongoing funding to meet the long-term needs of the course will need to be addressed satisfactorily, particularly if student satisfaction increases enrolments. The degree of recognition and acceptance of the course from constituent groups within the University, such as the Office of Research, faculty administrators and supervisors, will also play a significant role in the future of *AIRS::Online* and place the course in a strong position to attract ongoing funding and support.

Further challenges relate to multi-modal delivery of online and face-to-face courses, which can be resource-intensive in terms of technological and face-to-face support, and the skill level of course facilitators who require an extensive depth of knowledge and understanding of the complexities of e-learning. While remaining cognisant of the heavy reliance on immediate feedback and personal support provided in AIRS:IFN001, another challenge is the provision of timely facilitator-led direction and student feedback in AIRS::Online in order that students experiencing difficulties relating to content, process or technology receive assistance at point of need.

Conclusion

Online courses provide unique opportunities for students when effectively constructed, managed and implemented. AIRS::Online is specifically designed to meet the advanced and changing needs of QUT's postgraduate research community by providing an alternative method of teaching and learning research level information literacy skills and concepts. By placing pedagogy at the heart of the learning process and before the technology, AIRS::Online reflects the effective blending of teaching and learning theory, educational practice and technological application to ensure that the learning outcomes of campus-based and online students are equally assured.

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