

# Bounding Borders, Building Bridges: partnering for quality outcomes in the online learning of information literacy

Peacock, Judith and Tweedale, Robyn and Fell, Peter and Vollmerhause, Kurt (2004) Bounding Borders, Building Bridges: partnering for quality outcomes in the online learning of information literacy. *Educause Australasia 2005: The Next Wave of Collaboration*, Auckland, New Zealand.

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## Abstract

IFN001:Advanced Information Retrieval (AIRS) is a mandatory coursework requirement of doctoral enrolment at QUT. It aims to assist research students in working toward their literature review through the development of advanced information literacy knowledge and practice. In response to increasing remote and offshore doctoral enrolments, and to support the University's objectives regarding flexible delivery and online teaching, QUT Library has led the development of an innovative online course. From 2005, AIRS Online is available as a parallel option to the face-to-face mode. AIRS Online provides a student-focussed learning environment which encourages deep learning and caters for diverse learning styles and needs. It is founded on the principle that the simple transfer of content to an online environment will not deliver equivalent learning outcomes for students. Unlike a passive web-based tutorial, the course has been designed to actively engage students in teacher-facilitated, self-directed learning. Integrating content and educational technology and linking across dual IT platforms, the development of AIRS Online has necessitated diverse partnering across the University between Library teaching and systems staff and various online, multimedia and web support staff. This paper explores the pedagogical, technical and administrative partnerships, issues and outcomes of re-crafting an existing classroom-based course for an online environment.

## Introduction

Queensland University of Technology (QUT) is one of Australia's largest universities, providing programs in most professional disciplines to over 40 000 students. Demographically, this cohort consists of a significant percentage of part-time (25%) and international students representing over 80 countries (12%), as well as external (or distance) students (approximately 10%). Positioned as 'a university for the real world' because of close links with industry and relevant applied research, the University seeks to ensure that QUT graduates possess the knowledge and capacity to continue their lifelong professional and personal development.

Mindful of its importance as a university of technology, staff and students have access to the latest educational technology. QUT's *Learning and Teaching Plan* outlines objectives which seek to provide "learning opportunities and academic support for a diverse range of students... and stimulating learning experiences making use of appropriate technology" (QUT, 2004a). These advances in turn "open up opportunities for adding newer and more innovative methods to the spoken lecture and the face-to-face seminar" (QUT, 1999). The Plan also specifies the need to provide an appropriate mix of physical and virtual learning environments which focus on student learning and improve connectedness "using the latest technology where appropriate [to] improve educational quality and flexibility... [environments] which reflect QUT's 'real world' orientation and support QUT's aim of developing information literacy skills in its

graduates" (QUT, 2004a). QUT uses an in-house system, *Online Learning & Teaching (OLT)*, to manage content for courses and units of study.

QUT also has a commitment to the development of graduate capabilities for all students. Identified as those "important values, attitudes, knowledge and skills that [students] should develop as part of their learning experience" (QUT 2004b), QUT seeks to produce graduates who can "contribute effectively as citizens, leaders in the wider community, and competent professionals within their chosen discipline" (ibid). Consistent with the University's objective to "graduate high quality research students who meet the needs of industry and the professions", these capabilities are also pursued as an outcome of postgraduate research programs (QUT 2004b). QUT Library provides leadership within the University in the systematic and sustainable development of one of these key graduate capabilities - information literacy.

This development is focused on: (i) raising the awareness of students and staff to the notion of information literacy as a lifelong learning attribute; (ii) developing a mutual understanding of the inherent principles and practices of information literacy; (iii) affecting attitudinal and cultural change pertaining to the learning and teaching of information literacy; (iv) leading change in learning and teaching practice to ensure that information literacy is a pervasive and enduring part of the learning environment (Carpenter, 1996); and (v) raising levels of student competence with respect to information knowledge, concepts and skills.

In particular, QUT Library's conceptual and practical approaches to the fusion of information literacy learning and teaching, discipline content and educational technology has set a benchmark of excellence which has drawn a high degree of global interest and acclaim. The commitment and leadership of the Library in these areas combined with a strong commitment to supporting the research goals of the University is demonstrated by the Library's recent reconceptualisation of its advanced information literacy course (IFN001) for researchers as an alternative online option.

## **IFN001:AIRS – the original mode**

*IFN001:Advanced Information Retrieval Skills (AIRS)* is a 4-credit point mandatory coursework requirement of enrolment for higher degree research (HRD) students at QUT. The unit aims to assist HRD students in working toward their literature review through the development of advanced information literacy knowledge, concepts and skills. Course content covers advanced search strategies and techniques, mastery of electronic information resources, efficient and effective Internet searching techniques, and proficient information management and current awareness strategies and practices.

Distinguished as the only accredited information literacy course in Australia higher education, AIRS has been offered in face-to-face mode since 1989. The course, of twelve contact hours, requires completion of an assessable component and uses standardised QUT *Student Evaluation of Teaching/Student Evaluation of Unit (SET/SEU)* processes to inform continuous improvement of the course. All HRD students must have completed, or be completing, IFN001:AIRS by Stage 2 confirmation. The AIRS Librarian is responsible for the teaching, assessment, evaluation and administration of the AIRS course.

## **IFN001:AIRS – the online mode**

QUT Library continually seeks to align the development and provision of resources and services to the strategic and operational imperatives of the University. Thus, throughout 2003-2004, with the strong support of the Office of Research and Research Training, the Library undertook the design and development of AIRS Online. From February 2005, AIRS will be offered to QUT HRD students in this alternate online mode.

In this mode, the course extends over twelve weeks (in accordance with standard unit and Stage 2 confirmation/fulltime timeframes) with all coursework, consultation and assessment completed wholly

online. While much of the students' learning will be self-directed, the AIRS Librarian - as with the face-to-face mode - facilitates the course to ensure the achievement of equivalent learning outcomes. In this respect, the online course provides scheduled opportunities whereby students can meet with each other and their facilitator to discuss and explore their learning. Also as with the on-campus mode, opportunities for formative feedback and one-to-one consultation are also incorporated as standard elements.

Walker (2003, p.1) highlights the active and creative role libraries can, and should, play in interactive, collaborative and global e-learning, including their key role in the initial planning, design and development of e-learning programs (ibid, p.7). In creating AIRS Online, the Library has acknowledged this role and responded to the University's goals to (i) make more effective use of online and face-to-face flexible learning environments, (ii) respond to the changing needs of an increasingly diverse and distributed student client group, and (iii) increase QUT's research profile and improve research outcomes.

### **Neither a small nor lonely task...**

The Library's guiding principle for the creation of AIRS Online has been to ensure that the online and face-to-face learning experience is equivalent in terms of outcomes for students, while also recognising the differences inherent in delivering education online. This tenet is in keeping with the notion that "online education should be about reinventing education using powerful new media" rather than imitating the 'analogue' environment by simply digitising and duplicating courses and classroom processes" (OECD, 2001, p.26). The design and development, therefore, has focused on creating a rigorous, interactive and engaging learning experience for students which combines self-paced and facilitated learning opportunities, incorporates synchronous and asynchronous activities in the design, and uses educational technologies to enhance (rather than drive) learning (Peacock, 2004).

To this end, the creation of AIRS Online demanded a great deal from the developers in terms of a thorough knowledge of the content (information literacy), and competency in instructional and web design, technical skills, writing skills for an electronic medium, visual and communications design and the coherent application of multimedia elements (Schlusmans, 2004). Schlusmans argues that developing integrated e-learning courses is an "industrial process which requires teamwork, cooperation between different specialists and a systematic workflow" (p.127) rather than a job for one individual. He reasons that there is not a one-to-one relationship between people and fields of expertise and that, while some people combined several fields of expertise, no one person combines them all. In keeping with Satchel Paige's more candid observation that "none of us is as smart as all of us" (Forman, 2003, p.44), this view has proven to be true when reflecting upon the development of AIRS Online. With no one individual possessing the entirety of the ideas, knowledge and skills required, collaborative and co-operative teamwork was essential to the successful production and implementation of the course.

Rossiter & Watters (2000) define co-operation as that which "implies working together, combining efforts within a common framework or agreed set of principles, to produce a joint outcome" (p.46) and collaboration as parties bringing to the process sometimes disparate, even opposing views. Thus, they believe that:

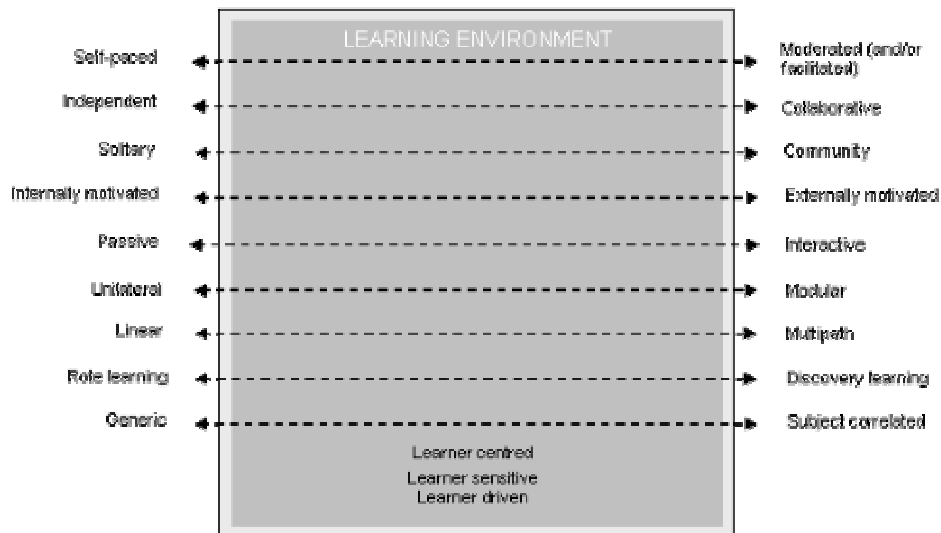
a collaborative initiative involves far more negotiation, discussion, patience and skills, than does a co-operative one, where many of the fundamental issues, uncertainties or contentions, have been resolved. Successful collaboration implies equal status and respect for all parties, and a genuine desire to reach a mutually agreed outcome (p.46).

Like Rossiter and Watters, success of the AIRS Online project relied heavily on cooperative *and* collaborative teamwork across University departments. As development progressed through the four phases of analysis, design, construction and testing (ibid), the team production of AIRS Online typified Schlusmans' "industrial process" in every respect.

## AIRS Online – the “industrial process”

To achieve learning outcomes and meet the diverse needs of learners in an online environment, Peacock (2004) notes that it takes somewhat of a Frankenstein-ian approach to create the right learning “monster” for the right learning purpose for the right learner. The practitioner must constantly seek the most effective pedagogical and technological combination of many ingredients within extreme positions along multiple learning continuums (Fig. 1). With no definitive schematic for creating the quintessential online environment for information literacy education, the challenge was to create a unique online learning recipe for AIRS Online which would answer to the needs of the learners with whom it would engage.

Figure 1: E-learning continuum (Peacock, 2004)

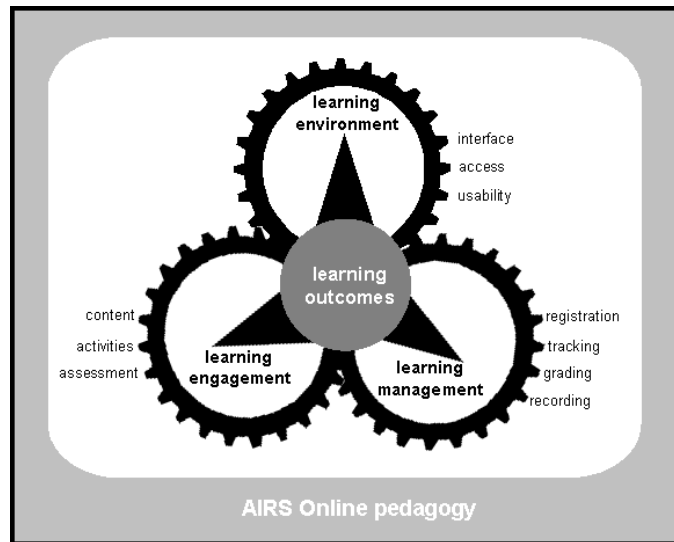


The two key threads intertwined throughout the AIRS Online “recipe” are technology and adult learning. Throughout the complex process of creating suitable learning experiences for adults, the AIRS Online developers have sought to make decisions that are logical, credible and defensible (Delahaye, 2000, p.256). Technology “enables information, knowledge and experience to be presented in new ways” (OECD 2001 p22) which are often highly suited to the needs of the adult learner, such as:

- choices of learning style;
- customised and personalised learning materials and support;
- individualised tracking and recording of learning;
- self-assessment and monitoring of learner performance;
- interactive communications between participants and facilitators in the learning process; and
- interactive access to educational resources (OECD p23).

Thus, the learning recipe for AIRS Online can be defined in quite simplistic terms: learning environment (interface, access, usability), learning engagement (content, activities, assessment) and learning management (registration, tracking, grading, recording). These three elements pivot around, and drive, learning outcomes (Fig. 2). Quality assurance mechanisms are interwoven throughout the process.

Figure 2: AIRS Online pedagogy



### **A word about the developers...**

To follow the cooking analogy one further step, the primary chefs of this e-learning brew were QUT Library staff. Therefore, a considerable proportion of the collaborative activity occurred *within* the Library. The librarians and systems staff involved in the development teams were selected for their considerable expertise in, and knowledge and understanding of, learning and teaching, information literacy (as content and learning framework), the needs of HRD students, and e-learning and technical systems. To supplement this expertise, collaborative partnerships were formed with individuals and teams from many other departments from across QUT and from outside the University. In brief, development included teaching librarians (and particularly the AIRS Librarian), computing and systems officers, web interface and graphic designers, OLT support staff, video production technicians as well as a visual interactions designer, instructional designer and external consultant on assessment. A full description of these roles is provided as Appendix A. These contributions are discussed in the context of the development of the three learning components of environment, engagement and management; from this point forward, the term “development team” is used to denote the QUT Library-based team.

### **AIRS Online Learning Environment (interface, access, usability)**

AIRS Online bridges dual IT platforms. The courseware (including learning activities) resides on a Library server, while the assessment and online community forum features are accessed via QUT’s OLT platform. Martin and Lee (2003) advocate the use of standardised systems (such as authentication procedures and password control) to provide a consistent learning experience for students. The challenge for the developers, then, was to ensure that the AIRS Online environment would provide this consistency of interface, access and usability.

Consequently, Library Systems officers and the content developers worked closely with graphic and web designers from QUT Publications on the construction of the technical infrastructure and design of the interface (banners, navigational elements and icons), and OLT support staff to merge this interface with the course OLT site. These site aesthetics were considered essential to enhancing the student’s learning experience, a view supported by Lockee, Moore & Burton (2002) who maintain that “even an instructionally sound online course can fail to produce learning outcomes if the students encounter a poorly designed web site. (p.22)”

Library Systems staff also worked with OLT support staff on the programming for extra features for the courseware site, and programmers from Information Technology Services (ITS) to enable user authentication for QUT staff and students only to secure access to the courseware. As the OLT system does not support a learning tracking system (to allow students to monitor their progress), this functionality – *My Learning Pathway* – was created and enabled on the Library's server. Finally, to cater for users with disabilities (Lockee, Moore & Burton, 2002), Library systems officers collaborated with ITS to ensure that the underlying technology complies with university guidelines. As a result, students can select alternative versions of Flash animations and other interactive elements to suit their own bandwidth and resolution parameters, and most multimedia elements have appending transcripts and audio commentary to aid accessibility (and/or learning style preferences).

These development processes occurred in tandem to ensure that (i) the technological elements relating to access, interface and usability would integrate effectively, (ii) the user interface would comply with QUT web guidelines on accessibility, and (iii) the environment would reflect tested e-learning interface design principles and coherently bind content with learning objects and OLT-based activities. As a result, the transition between the two platforms is seamless, tied together by an integrated navigation system and common look and feel of an attractive, yet simple, interface.

### **AIRS Online Learning Engagement (content, activities, assessment)**

Print believes that “curriculum design should consider the knowledge that is of most worth to the learners, the activities that are most effective in enabling the learners to acquire this knowledge, and the most appropriate way to organize these activities” (Delahaye, 2000, p.232). When developing e-learning-based curricula, this statement is no less true. It is also important that learning in an online environment is supplemented by a high degree of interactivity, builds in flexibility for self-directed learning, uses technology to enhance rather than determine or direct learning, creates contextualised learning experiences, and encourages active learning and reflective practice (Gabriel, Ostridge & Doiron, 2003; Garrison & Anderson, 2003).

Building a course for adult learners injects other variables into the equation for consideration, such as existing knowledge, motivation, and learning orientation, cycles and styles (Hertzberg, 1959; Biggs, 1989; Wlodkowski, 1993; Delahaye 2000). That these variables shift according to the specific needs of the learner should be accommodated in the development of any learning experience. As Delahaye (2000) states, the skill of the designer, e-learning or otherwise, is to create a learning experience which consists of “linked and appropriate learning strategies that will provided the maximum opportunities for the learners to achieve the desired learning outcomes effectively and in the most efficient manner” (p.232).

AIRS Online developers founded the courseware design upon these principles. The focus of the design specifically relates to assessment methods, content progression and exposure, and activity- and enquiry-based engagement with the content. The two other driving factors in the design of the course were to ensure learning and assessment tasks would be meaningful to students from all disciplines, and that student input (in terms of time and effort), output (in terms of effort and product) and learning outcomes would correspond to those of the face-to-face course.

The content and learning outcomes are based on those for the existing IFN001:AIRS, but have also been linked (via a graduate outcomes map) to the course assessment and national standards on information literacy (*Australian and New Zealand Information Literacy Framework: principles, standards and practice*: Bundy, 2004). An instructional designer from TALSS was contracted to review the outcomes of the course to ensure “learning integrity” in terms of design, content and outcomes, and the visual interactions designer created an interactive course map for the final review module of the course. Via such linkages, students have multiple ways to monitor and review their learning in the course.

The developers of AIRS Online focused on building in functions and features which allow for, and support, self-directed learning, a process described by Candy (1991) as one in which individuals take the initiative,

with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. Accordingly, AIRS Online uses a Learning Contract to establish a basis for the learner and facilitator to mutually understand and define learning needs, roles and responsibilities. An external learning consultant provided assistance with the development of this contract in terms of language and meaning, particularly as it relates to international, transnational or ESL students. A Library Systems officer on the project also developed a tracking feature called “My Learning Path”, a personal portal for each student to use to monitor their progress in the course. This feature provides ideal parameters for online learning in terms of flexibility of time, place and pace, enables students to follow their own personalised learning paths, and offers opportunities for self-directed learning and independent study (Schlusmans, 2004).

As with all learning, higher-level comprehension is derived from the opportunity to engage in active learning contextualised to real-world experiences. The development of the interactive elements of AIRS Online was achieved through multiple collaborative partnerships between the Library’s development team and instructional, graphic and visual interaction designers. These partnerships brought expertise of various ICT and educational technologies together to produce engaging activities for students which combine:

- graphical illustrations;
- animated and interactive demonstrations of concepts (Macromedia Flash) and database/software application (Carbon ViewletBuilder);
- audio and video recordings and transcripts; and
- drag-and-drop activities and JavaScript quizzes.

Staff from the Educational Television (ETV) unit provided support and development of video content and worked with Library Systems staff to integrate this material into the fabric of the course. There were also cross-institutional partnerships with staff from the University of Washington to use and adapt original source coding for a number of Flash visualisations used in the courseware, and the University of Illinois Online to adapt chat FAQs and help guides.

The assessment is an integral component of AIRS Online. The developers have sought creative ways to assess student learning which respond to those imperatives to renew assessment practice identified by James, McInnis & Devlin (2002) of guiding student learning, generic skills development, academic integrity, cost-efficiency, technological possibilities and increasing student diversity. The OLT platform hosts the assessment of the course as it provides a reliable, robust system and a established base of technological support for learners and developers (Lockee, et al., 2002).

The development team (particularly the AIRS Librarian), external assessment consultant, OLT Support team and the instructional designer worked closely over an extensive period to develop authentic assessment tasks where “students are asked to perform real-world tasks that demonstrate meaningful application of essential knowledge and skills” (Meuller, 2003). Consequently, the assessment combines formative and summative methods in the form of online completion and electronic submission of assignments, quizzes and multiple choice exercises, short answer and reflective questions, and peer discussions via forums and chat (the latter also addressing factors relating to learner isolation and facilitating online communities of learning).

### **The AIRS Online Learning Management (registration, tracking, grading, recording)**

As mentioned, commencing HRD students are automatically enrolled in IFN001:AIRS by the Office of Research and Research Training. Students then self-select according to their needs from a semester timetable of AIRS courses, and register via the Library’s online course registration system, *Program-Finder*. This part of the process remains the same for the online course.

However, due to the integration of certain OLT-based features underpinning the Resource Log, Reflective Journal and forum spaces, additional registration routines have been necessarily created to ensure that

students can join a cohort for community activities, but also each possess a secure space within that cohort to access their own Log and Journal. Developing and implementing such complex processes necessitated extensive collaboration between the development team and the TALSS instructional designer.

This partnership garnered excellent results in terms of the student and facilitator's management of the course. Each student has access to public and private course spaces which allows for contact with their peers and individual engagement with their course facilitator for formative feedback and summative assessment purposes. The processes developed by the instructional designer have also ensured that the facilitator can easily monitor the learning of each student, manage multiple parallel cohorts, and comply with university guidelines relating to assessment accountability and course completion requirements. Interestingly, the complexities of this process has necessitated an additional, long-term partnership between the AIRS Librarian and the administrative staff within the Office of the Library Director. As not all of the registration processes are automated, administrative staff undertake critical manual procedures on an ongoing basis to ensure students are fully registered in the course of their choosing.

## Conclusion

Like Zemsky (2004), we believe the story of e-learning is still unfolding, that educational learning technologies "will only continue to serve as a major catalyst of innovation" (p.60) and that current and future success will depend as much – if not more – on the context in which we operate as educators, as on the power of the technologies we employ (ibid, p.57). There is no doubt that the fusion of skilled professionals working towards the creation of AIRS Online has, in this respect, produced a course which "can accommodate growth, redirection and even reduced scope" (Sjogren, 2002, p.57). Sustaining that innovation, however, will depend on a "commitment to collaborative development and continuous quality improvement that systematically incorporates feedback from all involved in the teaching and learning process" (Twigg, 2001, p.30).

Many traditionalists bemoan the potential "loss" of professional autonomy and intellectual control that e-learning development brings. The OECD (2001), however, believes that partnerships can lead to greater role specialisation in the production and delivery of knowledge and learning materials, with many staff becoming members of complex, interdependent teams in a longer, even global, production line. In the industrial process that has born AIRS Online, these teams formed, transformed and reformed to respond to a wide range of pedagogical, technical and administrative challenges.

Ultimately, the defining principles for AIRS Online have been in keeping with those for facilitating learning in any environment – that is, the educator (or e-learning developer) must focus on the learner and the learner's needs. The AIRS Online developers worked from the position that "good technology alone does not deliver educational success [and that] it only becomes valuable in education if learners and teachers can do something useful with it" (OECD, 2001, p.24). It was the expertise of the individuals who collaborated in the development of AIRS Online which ensures that the integrity of the course remains true to these founding educational principles.

The final product truly reflects Alexander Graham Bell's assertion that "great discoveries and improvements invariably involve the cooperation of many minds". The energetic convergence of expertise in the development of AIRS Online has assured a quality educational product which can ensure genuine learning outcomes for QUT students now, and in the future. It is anticipated that this initiative may also leverage large investments in the development of other such courses that will ultimately benefit every member of the QUT academic community (Ayers, 2003). In deference to the words of author Ralph Charrell, the development of AIRS Online has demonstrated that through cooperation and collaboration, rather than conflict, the greatest educational successes can be derived.



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## Appendix A

The AIRS Online course has been developed with the expert guidance and assistance of an extended team of highly dedicated and professional staff, including:

### **AIRS Online Development Team: Stages I-II (2003)**

Project Coordinator: Judith Peacock  
AIRS Librarian: Peter Fell  
Project Officer: Stephanie Bradbury (Liaison Librarian/Humanities and Human Services)  
Library Systems Officer: Kurt Vollmerhause  
Library Systems Officer: Ursula Then  
Library Systems Officer: Michelle Conkas  
Computing Systems Officer: Glen Cook

### **AIRS Online Development Team: Stage III (2004)**

Project Coordinator: Judith Peacock  
Project Manager: Robyn Tweedale (Liaison Librarian/Information Technology)  
AIRS Librarian: Peter Fell  
Library Systems Officer: Michelle Conkas

Library Systems Officer: Kurt Vollmerhause  
Computing Systems Officer: Julian Kapitzke  
Visual Interactions Designer: Tim Robinson

### **The Project Teams were assisted by the invaluable contribution of the following individuals and/or support teams:**

Web interface design: QUT Web Solutions  
Learning platform integration: OLT Support Team/ QUT Teaching & Learning Support Services (TALSS)  
Instructional design: Meredith Godat (TALSS)  
Assessment & Learning  
Contract consultation: Patricia Kelly (Lecturer, Uni. Sunshine Coast; QUT/Faculty BEE)  
Video production: Educational TV unit (TALSS)  
AIRS Librarian (half-time): Graham Dawson (Liaison Librarian/ Engineering)  
Additional technical support and guidance: Library Systems Group, including Manager/ Sarah Fredline  
Staff release & replacement: Library Branch Managers and Reference Services Managers

### **QUT Library also particularly wishes to acknowledge:**

- the contribution of the many *QUT librarians and HRD students* who participated in focus groups and/or usability testing for their valuable time and thoughtful feedback.

- *Professor Rod Wissler* (Director/ Research & Research Training), *Susan Gasson* (Coordinator/Research Students Centre), the *QUT Research Degrees Committee* and the *QUT Office of Research & Research*

*Training* for their ongoing guidance and support with governance and procedural matters relating to the development and management of AIRS:IFN001, including AIRS Online.

- the *University of Washington* for their generous permission to use and adapt original source coding for a number of Flash visualisations used in the courseware and *University of Illinois Online* for kind permission to adapt their Chat FAQs and Chat "tips & tricks".