

## Case studies of online assessment

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### *Abstract*

*This paper outlines the progress to date of a project to compile, analyse and share examples of innovative online assessment activities using; online testing; teamwork and collaboration; simulations and role plays, and dialogue with experts and across cultures. The aim of this research is to provide teaching academics and educational developers with examples of assessment strategies that have been successfully applied in higher education, and to derive a number of key principles about online assessment that will be useful for future research. The project involves case studies from two Australian universities, which have been used to develop an initial set of eight exemplars and analysed to identify commonalities and differences. In the next phase of the project, these will be shared with teaching staff from two Hong Kong Universities, who will be asked to assess the applicability of the assessment designs and approaches to their teaching contexts.*

### *Keywords*

*online learning, assessment, case studies, research*

## Background

It can be argued that over the past two decades the academic practices in higher education have been transformed by the adoption of the online environment as a medium for teaching, learning and assessment. It is also commonly observed that while assessment drives student learning, the design of assessment for the online context has been the last core activity to be adopted across the board (Alexander & McKenzie, 1998; Howell, 2003). Perhaps because of its critical importance to learning, the adoption of innovations in online assessment has been slow to diffuse through higher education. There is simply too much at stake if the technology should let us down or problems beyond the academics' control should interfere with the assessment process (Collis & Moonen, 2001).

However, the reliability of online networks and the availability of student access to them have been steadily increasing over the past five years (GlobalReach, 2004). Since the view still holds that assessment is the 'de facto curriculum' (Rowntree, 1987), designing assessment tasks that take advantage of the affordances of the online environment while also overcoming its limitations is a key challenge in becoming an online teacher (Bennett, 2004; Bennett & Lockyer, 2004; O'Reilly & Hayden, in press).

Initiatives aimed at examining the impacts of online assessment design are seen in Keppell, et al's work (Keppell, Au, & Ma, 2005; Keppell, Au, Ma, & Chan, 2004). The authors undertook a development-based research approach to examine learning-oriented assessment in a project that focussed on redesigning four modules on innovative online assessment and four modules on collaborative online assessment. Although "networked courses require the course designers to rethink the assessment strategy if it is to reflect the aims of the course and appropriately assess the skills developed during the course" (Macdonald, Weller, & Mason, 2002, p. 9), Keppell et al. found that focussing on changing the assessment to a learning-oriented approach resulted in a change of pedagogy, aims and objectives. Changing assessment thus represents an important way that educational designers can assist academics in designing to utilise innovative teaching and learning principles.

Academic staff who are developing their assessment ideas in keeping with opportunities offered by flexible modes of study will often request exemplars to consider. Educational designers are often in a position to provide examples drawn from other disciplines and known resources. The development reported in this paper in the form of a collection of case studies from two Australian universities, highlights a number of concrete examples of collaborative design and effective assessment strategies that academics can adapt to their own practices.

## Project description

The collection of Australian case studies in this paper represents a pilot component of a larger research project that involves Southern Cross University and the University of Wollongong Australia, as well as the Hong Kong Institute of Education and the University of Science and Technology, Hong Kong. The four-way research project aims to develop exemplars of online assessment and distil a number of key principles about online assessment useful for future research where academic staff from the participating institutions can refer to these exemplars and principles in collaborating on the design of online approaches to assessment. It is envisaged that the resources developed through this project will also be of benefit to a worldwide audience.

The significance of this project is in the showcasing of innovative online assessments across two Australian institutions that are both in a process of collaborating further with two Hong Kong institutions. In a flexible educational context where academic staff gain enormously from cross-cultural and cross-disciplinary exchange of views, this project showcases eight case studies that are broadly applicable. The research also builds upon the work of the principal researchers in terms of questions being explored on the collaborative and transdisciplinary design of assessment (O'Reilly, 2003, 2004), those of the design research approach to investigating development of online assessment (Bennett, 2004; Bennett & Lockyer, 2004), and implications of the learning oriented approach to assessment design (Keppell et al., 2005; Keppell et al., 2004).

## Methodology

The project adopted a design research methodology to ensure that ultimately, staff across the four institutions and a number of disciplinary fields, who will, in future, be responsible for the design of valid, reliable and sustainable assessment tasks can do so within the bounds of an iterative and collaborative strategy. The development of a website to showcase the first eight case studies was included to facilitate a reflective approach to the next stage of design, development, evaluation and review in accordance with the established elements of the design research method. Each of these steps will inform the larger scale project which will also use the action research approach (cycles to plan, act, observe and reflect).

The methodology for this pilot study uses a variation on the design research methodology (represented in Figure 1), which involves iterative cycles of analysis, development, evaluation and reflection. This process allows problems, solutions and methods to be refined on the basis of the data collected. The timeframe for this pilot study has allowed for the first iteration of the cycle, the second iteration is to be implemented through the larger project and the longer timeframe. The eight case study exemplars identified in this cycle had already been developed, implemented and evaluated by subject assessors. The cycle was thus commenced at the reflection stage and the website resources showcasing these exemplars have been developed to be used as a stimulus for shared reflection across the four institutions involved. In addition the website is of potential interest to anyone looking for ideas in online assessment design (see [http://www.scu.edu.au/services/tl/index.php?page\\_id=34&menu=2\\_44](http://www.scu.edu.au/services/tl/index.php?page_id=34&menu=2_44)).

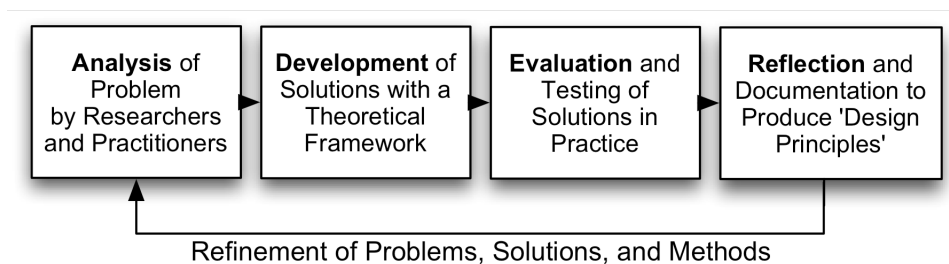


Figure 1: The design research cycle (Adapted from Reeves, 2000)

Design research is well suited to a study such as this one because it provides a systematic approach that draws upon and expands theory while also contributing to practice. Also called development research, this methodology has three key characteristics (Design-based Research Collective, 2003; van den Akker, 1999):

- it involves collaboration between researchers and practitioners to characterise problems in terms of previous research and practice; identify possible solutions; and test those solutions within real life contexts
- it is an iterative process in which evaluation feeds back into the design process and issues that emerge during implementation can be addressed
- the outcomes of design research lead to the generation of new knowledge in the form of design principles that can be explicitly linked to underpinning theory.

The use of the design research approach ensures that the product of the larger cross-national project (i.e. assessment design) is based on the best available research, with extensive input and testing by practitioners to ensure that it is usable and relevant. The initial aim of showcasing eight Australian case study exemplars as innovations in assessment is in preparation for cross-national collaboration to design and develop further innovations in online assessment in the latter part of 2005 and through early 2006.

## Results

Initially ethics clearance was obtained from both Southern Cross University and the University of Wollongong where the project details were provided and an explanation given as to the appropriateness of revealing participants' names on a public website. Academic staff from both these Australian universities then agreed to contribute case study details and be involved in the cross-national research through a series of steps.

Each subject assessor (and assessment designer) first completed a proforma detailing assessment tasks and the design process. Depending on the need for clarification, one or two follow-up personal meetings with researchers were undertaken to progress discussions about assessment design, pedagogical rationale and lessons learned. Two documents were drafted for each case from these details (a) a brief summary and (b) a full description of the assessment design, pedagogical rationale and lessons learned. Clear credit has been included for each contributor of the eight exemplars. Refer to website for exemplars.

## Cases

The eight cases shown on the website cover several disciplinary areas including social sciences, business, science and education. The exemplars cover first year through to final year undergraduate cases. Brief details are provided below, for full description of the cases readers are encouraged to visit the website.

### 1. Accessing and critically evaluating information: Learning and communication

'Accessing and critically evaluating information' is the first assessment task for a first year, first semester subject for beginning students in both the School of Social Sciences and the School of Commerce and Management at Southern Cross University. The core unit, 'Learning and Communication' is designed as a scaffolded learning experience. The unit aims to equip beginning students, whether school leavers or mature age students, with generic research and study skills for their entire undergraduate program.

The focus of this case study is the assessment task 'Accessing and critically evaluating information', which is the students' first preparation challenge. The case study describes students' development in acquiring research and critical evaluation skills using online search tools and strategies. At the same time students are learning to access the unit and its components online. The assessment task sets the students up with the necessary research and technological skills to complete the remaining assessment items of the unit. These skills further support their whole program at university and ultimately transfer to their role in the community and workplace.

### 2. First year online quiz: Chemistry

The online assessment design, online quizzes, is designed as an aid to study in first year chemistry, to assist the student's processes of understanding concepts and problem-solving skills. In a different process to gaining knowledge, the online quizzes encourage students to read the relevant textbooks in order to think about the topics covered and test their understanding of the main concepts. The online assessment task prepares students with skills to undertake further quizzes used in other science subjects.

### **3. Graduate discussion forum: Advanced auditing**

This forum assessment task aims to enhance students' learning experience by providing them with the option of direct contact with current practitioners in the relevant business environment, using computer-based technology. The 'optional' online learning strategy links theory to practice through an authentic, or 'real world' learning environment, where students can learn about the nature of work in professional practice. The question and answer discussion forums provide students with access to the diversity of professional perspectives in the field of standards and codes of practice. Three discussion forums are conducted online. The first engages students in discussion with recent graduates who are employees of public accounting firms and the second with partners of regional public accounting firms. A third forum is set up for students to enter their reflective summary of the learning activity.

### **4. Online multiple-choice tests: Quantitative analysis for Business**

This case study provides an example of online assessment design that facilitates the students' learning by giving continuous assessment and immediate feedback. The online multiple-choice tests are a series of six online tests spread throughout the semester that are 'optional' and encouraged by the lecturer, who considers assessment as learning. This practical mode of learning assists the students' reinforcement of definitions and concepts applicable to their business studies, and also helps them to gain experience in time and priority management. Where students choose not to take the tests, their final exam is weighted more heavily.

### **5. Online role play: Introduction to tertiary teaching**

The focus of the online role play assessment task is to assist in clarifying the complexities related to assessment, particularly in identifying issues underlying criterion-referenced assessment. Specifically, the role play aims to assist participants to adopt a criterion-referenced assessment approach used at university, through participation in a realistic scenario. This case study outlines how the online assessment design offers some advantages over face-to-face role play by potentially reducing some of the stressful aspects. Further, through the online activity, participants learn to use the online discussion forums and associated facilities on the university's learning management system, WebCT.

### **6. Research groups and conference teams: Ecological restoration and monitoring**

This assessment scheme aims to equip students with the skills necessary to design and execute a research project, prepare and review a research paper for publication in the proceedings of a conference, and to present project outcomes to an audience. The end of semester conference is attended by students, lecturers, individuals from the community of practice and members of the public. This case study outlines an intense and exciting conference event and the lead-up to it including research undertaken by students in collaboration with community stakeholders, peer collaboration, peer review and the editorial process for published conference proceedings. All tasks associated with the conference are supported by online technology, for example exchange of messages and documents for teamwork. Communication and document exchange for research groups is also carried out through computer-mediated means. Students undertake an evaluation of the conference activities. The multiple learning processes are synthesised by students through their activities in both group research and conference team work.

### **7. Teamwork: Accounting**

The online assessment design titled 'Teamwork' is linked to the graduate attribute of teamwork in the discipline of Accounting. It aims to practically assist students to work in groups, ensuring an equal and visible contribution of each student towards the group assessment item. This case study outlines how the online assessment design provides a new type of collaborative writing online whereby students contribute to develop a report together. The online component offers an opportunity for students to link theory with practice resulting in a group contribution towards a web-based document. The final product incorporates a practitioner-focused subject with current issues related to the field, in this case, a government review of the Corporations Act. This assessment task enables students to access other students' work in the course for information, and further offers an online forum for group communication and discussion.

## **8. Visual design gallery space: Education/instructional design**

The online assessment design, 'Visual design gallery space', aims to provide students, working in an instructional/visual design capacity, with an online gallery space to view, develop and collaborate on their visual design works in teams and individually. This case study outlines the ways in which students are provided with opportunities to collaboratively develop and discuss their works in a visual design assignment through online access to a range of design exemplars. Students in this setting are exposed to: broader frameworks for research in the field; real life examples of design; a wider capacity for the generation of ideas, development of materials and design elements; and a greater diversity of cross-cultural elements of design. Further, the students learn technological skills needed for implementing their visual design ideas. The gallery space significantly offers students ongoing online support and dialogue between lecturers and students for the reflection and development of good design principles.

### ***Pedagogical principles***

Beginning with a clear pedagogical rationale is the first key quality of online assessment. The pedagogical rationales have been included in the details for each case and in all instances this was the driver for the design of assessment tasks, i.e. the online technologies were always used as a tool to put into practice a range of pedagogical principles. Explicit values, aims, criteria and standards are provided to students in their task descriptions. Preliminary analysis indicates that principles of online assessment design emerging from the exemplars further reflect the ten key qualities discussed by Morgan and O'Reilly (2005), including those concerned with providing rapid feedback for developing skills and understanding, the dynamic experiences of role play and teamwork, and authentic learning enabled through assessment tasks involving external experts, the professional community of practice or the workplace context.

### **Rapid feedback**

The use of online assessment in the form of quizzes provided a well-scaffolded approach to facilitating the development of generic foundation skills in Case studies 1 and 2. The pedagogical rationale in these cases is based on the facility for rapid feedback via online quizzes and thus this principle also applies to Cases 4 and 6 that also involve the use of online quizzes. Though Case 8 does not include the use of a quiz, nevertheless, the capability for rapid feedback through online methods was described as a key feature of this design subject where sufficient time was needed to incorporate peer assessment into students' grades. Providing sufficient and timely feedback, together with a facilitative degree of structure, are also two of the key qualities of assessment online.

### **Access to multiple perspectives**

An awareness of students' learning contexts and perceptions underscores any decision to incorporate a greater diversity of perspectives in the learning experience (Morgan & O'Reilly, 2005). The use of external experts and the contribution to discussion from a diversity of perspectives, including different cultural, political, social and values-based perspectives, are a particularly important feature of Cases 3, 6 and 8, which highlight one of the clear affordances of online technologies. No longer does the 'expert' need to be available in the same place and at the same time as the students for their learning to gain from such a rich experience.

### **Support for collaboration and interaction**

Teamwork and role play as forms of assessment are not restricted to the online environment, but in Cases 5, 6, 7 and 8, the way these features are used, take full advantage of the unique features of the online environment where anonymity can be controlled during role plays and, conversely, where the relative input of team members can be made transparent. These cases also illustrate another valuable aspect of the online environment, i.e. its inherent novelty and capacity to support learning within a context of having fun. The engagement of learners that occurs when they are having fun leads to a further key quality of assessment for online, i.e. designing relevant, authentic and holistic tasks (Morgan & O'Reilly, 2005).

### **Authentic learning**

Authentic learning, as evident through the assessment tasks in Cases 3, 6, 7 and 8, is also shown to be an important principle in the effectiveness of online assessment design. The connection to real-world activities in each of these cases further reinforces some of the other strategies already mentioned, i.e. the use of real-world experts (Cases 3 and 6), working with members of the professional community (Case 6) and working with real artefacts of the profession (Cases 7 and 8). Such authentic learning cases (in particular, Cases 3 and 6) also rely on constructivist learning approaches to ensure greater autonomy in student engagement with the assessment tasks.

## Practical implications

Implications for administration of assessment processes have also been showcased in these cases. With the exception of Case 5 (premised on anonymity) and Case 7 (an on-campus subject), all other cases featured a blended cohort of students — mixing together on-campus and off-campus learners in an online environment. Depending on different institutional arrangements, this has potential implications for administrative systems such as processing submission of assignments that have been streamlined by restricting options to electronic submission. Alternatively, institutional systems are often bypassed in offering more flexibility to students when allowing them some choice in timing their asynchronous contributions to discussion. These types of graded submissions are not necessarily logged centrally however, as in all instances, faculty remain accountable for their validity and reliability. A consistent administrative feature in all cases was the easy access to supplementary web resources provided to students in order to complete their assignments.

The design processes described in these eight cases included an acknowledgement by all case contributors that their ideas were developed over a period of time. What is showcased on the website arises from an iterative design process, so although the assessment design for Case 1 was implemented for the first time, faculty involved identified that their ideas had been drawn from previous teaching experience and that they would be returning to the current design with a view to improvement in the ensuing semesters. Furthermore, all case contributors acknowledged the input they had received over time from colleagues in their own disciplines or from colleagues outside their disciplinary domains. Educational designers were also acknowledged as having a valuable contribution to make in designing assessment for online, as were the graduates (Case 3), the community of practice (Case 6), the technical staff and students themselves (Case 8).

Future developments of the online assessment designs showcased that were flagged by the case contributors include the need to address the issue of authenticating students' identity when submitting online quizzes, building or requesting technical solutions to the quiz format (where mathematical symbols are involved), developing the art of constructing valid and reliable quiz questions, and the impact on one's marking practices if marking discursive online submissions either on-screen or off-screen. This kind of concern, with continuous improvement via evaluation and quality enhancement expressed by case contributors, is the final of the ten key qualities of assessment for online (Morgan & O'Reilly, 2005).

## Next steps

### **1. Hong Kong cases**

In support of the professional development aspect of this project, a further four cases of effective online assessment are being developed by the two Hong Kong partners for inclusion in the website and it is expected that these cases will be completed by the end of August 2005. It is important for the Hong Kong partners to build upon the collection of the first eight cases, so that their target group for professional development are able to reflect upon the cross-national nature of discussions as support for their own online assessment design process.

### **2. Identify 3–4 novice online assessors**

A small number of staff who are new to designing assessment for online learning will be invited to develop their own innovations with the support of the principle researchers who can collaborate on the basis of their role as educational designers. The small number of say, three or four staff, from the two Hong Kong institutions will be able to work by computer mediated communications after an initial face-to-face meeting with the Australian researchers in late August.

### **3. Professional development via discussion forum**

Drawing upon the twelve case study exemplars and the emergent principles of online assessment design, four check-ins are planned to take place within the online Discussion Forum. This forum is being hosted in Hong Kong, and educational design staff involved in the project will facilitate discussions on design of assessment for online. Reference to all eight Australian cases plus the four Hong King cases which will be on the website by that time will help to inform discussions. The four check-in sessions will address:

- i. Process and timeframes to be agreed.
- ii. Blueprint of the online assessment design.
- iii. Early draft.
- iv. Final draft.

#### 4. Review by initial case developers

On completion of the final draft of the online assessment design and prior to its implementation, the original case study contributors will be invited to review the details developed by novice staff in conjunction with educational design support.

The novice staff will provide feedback to the twelve case study providers including comments on what was useful and what may have been clearer in the case descriptor, as well as further ideas of development in regards to the pedagogical structure of the assessment tasks itself. Common practices and shared ideas for innovations in online assessment will be explored.

#### 5. Implement January 2006

The newly developed and peer-reviewed assessment designs will be implemented in the next teaching session in Hong Kong beginning in January 2006.

### Conclusion

This paper has outlined completion of the pilot phase for a larger research project, as well as detailing the next steps that are scheduled for completion. The initial pilot phase has resulted in the development of a website to showcase eight cases of online assessment within two Australian Universities. The eight cases cover a range of levels in undergraduate study across a number of disciplines. The design of assessment tasks have included quizzes, role play, teamwork, and discussions with experts. The following stages of the project will rely on the website and its further development to support discussions and design processes for staff new to designing assessment for online. Initially intended for a target group of Hong Kong academics, the expanded website is hoped to be of benefit to a wider audience. The professional development process to be completed is hoped to be of mutual benefit to all academic peers involved.

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