National Teaching Fellowship Final Report

Rethinking assessment in the participatory digital world – Assessment 2.0

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http://www.transformingassessment.com
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Executive summary

This Fellowship sought to raise awareness of the potential for interactive and authentic e-assessments in tertiary education. One of the characteristics of the web environment is its ability to facilitate interactivity and to provide participants with instant feedback on their individual actions. Web 2.0 offers interactive activities for participants through many of the collaborative spaces available on the Internet; the key feature of Web 2.0 is that it facilitates and encourages a user-centric approach to creativity and peer review. Web 2.0 services allow users to aggregate, create or repurpose content; users can publish their insights or interpretations about an issue or object to a world-wide audience and receive feedback and commentary from others. Software applications such as blogs, social bookmarking, podcasts or wikis allow students to be active creators, not just passive receivers, of content or the experiences of others.

Assessment 2.0 is the term used to indicate assessment tasks that make use of digital tools or Web 2.0 spaces to present interactive assessment tasks to students and for allowing students to construct higher level responses through individual or collaborative efforts (Elliott, 2008). This Fellowship demonstrated how readily available digital tools and Web 2.0 approaches might be used to assess students within common institutional learning management systems or through the use of open source services.

The Fellowship created a website http://www.transformingassessment.com as a focal point for the activities and examples created during the program. There are significant resources for academic practitioners and academic developers on the website, as well as an extensive bibliography for e-assessment. The website has been accessed by over 12,000 unique visitors with over 58,000 hits. The Fellowship also organised a series of 25 webinars (web based seminars) where guest speakers, both international and national, presented on specific e-assessment topics to a world-wide audience which totalled more than 540 people over the series. The webinars were recorded and made available through YouTube. In addition, a series of short videos were constructed for Assessment 2.0 examples and these were also made available through YouTube; there have been over 28,000 hits on the YouTube site. An island in Second Life was constructed (http://slurl.com/secondlife/transformingassessment/254/254/23/) and was used to demonstrate how assessment tasks might be created within a virtual world. The Fellowship also highlighted how the quiz tool in the open source system Moodle might be linked to Second Life through the use of Sloodle. The Fellowship explored the use of virtual or remote laboratories and field trips, role-plays and scenario-based activities for e-assessment tasks. Finally, the Fellowship examined the growing use of serious or educational digital games for learning and assessment and why such approaches might become a common format for new learning and assessment spaces in tertiary education.

There are additional documents on e-assessment accompanying this report and on the website http://www.transformingassessment.com, including the two short guides 'A Practical Overview of E-Assessment for Teachers' and 'An Overview of E-Assessment for Senior Managers', as well as the longer 'Teacher's Handbook on e-Assessment'.

Geoffrey Crisp
Fellowship aims

The Fellowship had the following aims when it commenced in mid-2009.

- identify issues faced by teachers and institutions in assessing students in a collaborative, distributed, virtual environment
- collect case studies of different approaches to assessing students in these environments
- facilitate the development of local and international communities of practice in the assessment of Web 2.0 activities
- construct models to assist with the alignment of learning, teaching and assessment activities in Web 2.0 environments
- identify the types of assessment tasks and marking/grading schemes that are suited to assessing Web 2.0 activities
- investigate issues related to intellectual property rights, copyright, security, validity and reliability
- investigate accessibility issues in relation to Web 2.0 activities and assessment in these environments.

These aims have been realised during the Fellowship activities through the various seminars, workshops, webinars and publications undertaken as part of the dissemination and collaborations over the past two and a half years. The Fellowship website (http://www.transformingassessment.com) contains much of the output from these activities and also an extensive bibliography of e-assessment resources, including numerous reports and case studies by others. The webinar series proved to be an effective way to increase the breadth of topics that could be covered by the Fellowship and also enabled a wider group of participants to interact with the presenters compared to face-to-face sessions. I am particularly grateful for the generosity of the webinar presenters, many of whom had not presented in this format. There were some minor technical issues with a small number of webinars, but on the whole the series was very successful.

The sections on e-assessment which follow are adapted from the Fellowship's numerous publications, seminars and workshops.

Example of a scripted object interacting with an avatar in Second Life.
Introduction to assessment

The literature concerning learning and assessment has shown a shift over time from an initial emphasis on behaviourism, then through a constructivist approach (Nichols, 1994) and more recently to a neuroscience approach (Ablin, 2008). Our understanding of the importance that assessment plays in determining the approach that students will take in planning their learning has influenced much of the recent literature on learning and assessment design principles.

If we set assessment tasks where the students’ responses can be classified as correct or incorrect, we are likely assessing the recall of factual (declarative) knowledge. If we set assessment tasks where students are able to construct a response and we differentiate and reward alternative approaches to problem solving, then we are likely assessing functional or procedural knowledge (how students perform or how they operate in a given context). This latter situation is normally associated with higher level learning and we are generally more interested in the quality of the strategies that students employ in constructing their responses rather than just the actual artefact that they construct.

All assessment responses from students may be divided into two types, either a convergent type where every student is expected to provide the same response, or divergent where students may provide different but equally valued responses (Torrance & Pryor, 2001). Core knowledge (or the currently held truths for a discipline) is often assessed by methodologies favouring convergent responses. Assessment practices that use timed, paper-based examinations where students are required to sit in rows and denied access to external resources will likely be based on standardised questions and result in standardised responses. This will often result in relatively convergent responses from students. E-assessment has frequently been associated with questions requiring a convergent response; examples include the automated marking of multiple-choice questions where it is straightforward to code an algorithm that looks for a specific response and assigns a predetermined mark and feedback. Standardized feedback can be readily incorporated into the design process since the feedback will be the same for all students and can be presented in a timely manner so that it has an immediate impact on the students’ approach to current and (perhaps) future learning.

For divergent responses the assessor must distinguish between the (often) diverse student responses and determine their relative worth; this is difficult to do in an automated manner using a computer. Thus, e-assessment use has traditionally been dominated by questions that require a convergent response. Whereas convergent assessment responses are often associated with declarative knowledge, tasks requiring divergent responses are more often associated with testing functional or procedural knowledge, including the strategies students use to construct their responses. This Fellowship sought to demonstrate that e-assessment can be used to assess higher level learning through both convergent and divergent responses in an online environment.

E-assessments are often associated with the use of 'objective' questions, also known as selected response items as the student selects a response from the options offered. Typical examples would include multiple-choice, true/false, yes/no or, more recently, hot spot questions where students identify component parts of a digital image such as geological or anatomical features through the use of mouse clicks. There is often a relationship between the use of selected response formats
and the expectation of convergent responses. One of the disadvantages in using online selected response formats is the inability of students to justify or explain their choice, although this can be incorporated through the use of assertion-reasoning formats where both the response and the rationale for the response are offered as options.

In contrast to selected response items, constructed responses can use text, sound or images; they can involve the use of digital or physical objects, or the demonstration of a physical or virtual performance. Constructed responses normally provide more opportunities for students to justify or explain their reasoning compared to selected responses. Web 2.0 can provide new opportunities for teachers to redesign their assessment tasks so that students’ divergent responses can be constructed using new digital tools. This allows students to be more creative and to provide evidence of deep learning.

Those assessing with online methodologies have often had to justify the worth of the assessment outcomes by comparing them to those arising from traditional assessment approaches. The assumption here is that assessment outcomes from traditional approaches should be used as the benchmark for a quality education. This is an assumption that should be challenged more regularly. By using the affordances of the web we should be changing the nature of the assessment tasks themselves, so we should not be simply measuring the same outcomes as more traditional modes of assessment. Many of the standards and norms that have been associated with current assessment practices have been constructed through the use of traditional text-based or face-to-face assessment activities where students have deliberately been separated from resources and other people. This approach has privileged particular students and specific types of responses. The web environment changes this situation so we should be able to set new benchmarks for quality assessment tasks and responses.

**Assessment types**

There are four different types of assessment tasks that can be set for students; these include diagnostic, formative, summative and integrative. Diagnostic assessment is probably the most underutilised format in tertiary education and is often associated with a deficit model of student capabilities (Benseman & Sutton 2008). This situation should be changed so that diagnostic assessments are incorporated as an initial component in all courses/units and are seen as a pathway for encouraging a self-regulation paradigm in students’ approaches to current and future learning. Low stakes diagnostic tasks would establish a baseline for standards within a course, allow students to determine their preparedness for their current learning activities and also permit teachers to adjust their introductory activities so that the majority of the students are able to participate at a meaningful level. Diagnostic assessment tasks also highlight for students the core principle that identifying one’s capabilities is a critical step towards being a self-regulated learner and establishing control over the learning environment. Rather than using diagnostic assessment to highlight deficiencies in students and relegate those that perform poorly to remedial activities, teachers could take a more proactive approach that reinforces important principles for encouraging good learning practices.
Formative assessment tasks with timely and appropriate feedback should continue to be used much as they are at the present time; these tasks should be used primarily to have an impact on current learning and ultimately be connected to improved performances in summative tasks. Although it may be posited that formative assessment is predominantly about improving learning, whether or not improvements are seen in subsequent summative tasks, from the students’ perspective it is usually the results from the summative tasks that frame perceptions of how well they have developed capabilities and understandings within their courses/units.

Summative assessment tasks should continue to be used primarily for progression and certification purposes, but as stated above, students will often use performances in summative tasks as a proxy measure of their learning.

Integrative assessment could describe tasks whose primary purpose is to influence students’ approaches to future learning by providing activities that define and track strategies that students use to assess their own learning abilities and problem solving capabilities, the quality and standards of their responses and how they may adapt their learning to future scenarios.

Integrative assessment tasks have the following characteristics:

- students are provided with opportunities to make judgements about their own learning or performance through review and critique;
- students are provided with opportunities to define standards and expectations in their response;
- students are provided with opportunities to track and analyse their approaches to responding to a problem, issue, situation or performance;
- students are provided with opportunities to integrate prior or current feedback into their response;
- students are provided with opportunities to engage with a meaningful task that has inherent worth beyond just an assessment activity;
- students are rewarded for the quality of their analysis of metacognitive abilities, rather than declarative knowledge.

Should integrative assessment tasks be marked and graded and should they be a component in decisions about progression and certification? Integrative assessments could be used for traditional formative or summative purposes if student self-regulation and the capabilities associated with lifelong learning are situated within the graduate attributes or outcomes for a course. Marks and grades can be used as indicators of standards, even if they are not used to make decisions about progression and certification. The advantage of identifying an assessment task as being integrative is that students would realise that the primary purpose of the task is to provide feedback (or judgement if the task were summative) on their ability to be self-regulated learners. Students would be encouraged to identify and use standards and to apply their learning to future situations by being able to articulate their strategies or approaches to a task or situation. Whether the judgements for these integrative tasks comes from the teacher, the student or from peer review (or a combination of all three), will depend on the particular objectives set for the activity. Teachers could use integrative tasks in either formative or summative mode; the key characteristic for integrative assessment is that its primary purpose is to influence students’ approaches to future learning.
Interactive e-assessment examples

In the constructivist approach to learning, students are expected to make decisions and reflect on the consequences of those decisions (Rust, O'Donovan, & Price, 2005). A constructivist learning environment provides students with access to information and authentic learning tools. These same tools and information sources should be available for students to use when they undertake assessment tasks in order for students to demonstrate the development of higher order capabilities. One of the ways we can render e-assessment tasks more sophisticated is to provide students with tools that they can use to construct non-text responses, analyse data, interact with digital objects, or interrogate objects within an assessment task. The use of digital tools to construct assessment responses is aligned with the characteristics of the Web 2.0 environment which emphasises user control of the web and co-construction of objects by multiple participants. Assessment 2.0 uses tool-assisted tasks that provide students with opportunities for solving authentic and personalised problems; it facilitates deep approaches to learning as the task requires an understanding of how to use a tool to assist with the construction of the response (Elliot, 2008).

Allowing students to manipulate data, to examine the consequences of their responses and to make informed decisions about potential solutions are all consistent with assessing advanced skill development in students, as described by the higher levels of the SOLO taxonomy (Biggs & Tang, 2007). Simulations and sophisticated digital tools allow students to construct multistructural and relational responses to questions. Sophisticated e-assessment tasks are not meant to replicate paper-based assessments; they are designed to make use of the characteristics of the new digital educational environment, namely interactivity.

By providing students with tools that they must use to generate responses to questions, we are able to document the development of competencies and attributes that support current and future learning; students are actually developing
meta-cognitive strategies for learning. One of the issues with many current assessment designs is that they foster a dependency in students on the teacher; this dependency is related to students believing they cannot make judgements about their own learning or performance level without input from the teacher. Clearly teachers have a pivotal role in defining standards and making judgements about assessment responses, but students should also be provided with opportunities to develop skills in judging their own learning and performance levels (Boud & Falchikov, 2007). The ability of students to assess their own learning is critical to developing effective approaches to future learning. The difficult part for many teachers is designing appropriate learning activities that support the development of these meta-cognitive self analysis skills and then to construct assessment tasks that are aligned with these learning activities. Although authors such as Shute, Ventura, Bauer and Zapata-Rivera (2009) have proposed elegant models for measuring skills such as self-regulation or self-explanation, these approaches have not been translated to a format suitable for use by discipline academics, nor have they been incorporated into common learning management systems (LMS) such as Blackboard or Moodle. Using sophisticated e-assessment tasks created through a common LMS should provide a more accessible pathway for discipline academics to design tasks that facilitate the testing of higher order capabilities and also provide students with access to tools that enable them to make judgements about their own learning or performance level.

So how do we provide teachers with a design strategy for sophisticated e-assessment tasks that makes use of existing LMSs and does not increase their workload significantly? If we separate the interactive tool that the student will use to assist them in generating their response from the actual question by incorporating a web link (URL) to the tool within the question, the question and any feedback given by the teacher can be constructed in any quiz tool in any LMS (Figure 2). This design principle also requires only one copy of the interactive tool to exist on an institutional server and so it can be used many times for different purposes or with different groups of students.

![Figure 2. Design model for interactive e-assessment task.](image)
Not all digital tools will be suited to e-assessment tasks, nor will all discipline areas necessarily be able to find freely available resources. Nevertheless, teachers will find that there is a considerable number of suitable tools for many discipline areas.

**Use of Java applets for interactive e-assessment**

An example of an interactive tool that could be used by students is a Java applet, a small application that is written using the Java programming language and packaged so that it will play through a common web browser. It is very convenient for teachers and students when the digital tool to be used in a sophisticated e-assessment task is available in the form of a Java applet as no special software, other than a web browser, is required to use the tool.

Many educational Java applets are freely available through the web and teachers can readily find and use these educational tools by either linking to the tool through an embedded URL to an external web site, or requesting a copy of the appropriate Java applet (*.jar or *.class files) for use on an institutional server. Teachers will not need to learn how to write their own Java applets as there are many suitable tools already available. The main technical task for the teacher is to embed the appropriate URL into an e-assessment item in their LMS. The Fellowship website, [http://www.transformingassessment.com](http://www.transformingassessment.com) contains many examples of educational Java applets that teachers may use.

Figure 3 illustrates a typical example of a question constructed in a common LMS, incorporating a URL link to a Java applet; in this case the applet is a simulation of building a bridge and measuring the associated forces on different parts of the structure. The Java applet is available from the external website indicated in the question and is incorporated as a simple URL in the question. The student clicks on the link and a separate browser window will open; the student can then toggle between the tool and the question in the LMS.
Figure 3. Example of Java applet simulation embedded in an e-assessment question.

From the point of view of the student using the Java applet in an e-assessment, it makes no difference whether the tool is located on a local server within the institution or on a remote server across the world. The only issue for teachers to consider is whether access to the digital tool is required for a high stakes summative task; in this case it is likely to be more reliable to locate a copy of the tool on the institutional server as access to the tool can be controlled more readily at the local level. For low stakes summative or formative assessments, ensuring access to the tool at any time will be less critical.

The example in Figure 4 also highlights the potential of incorporating digital tools and simulations into e-assessments to significantly change the type of question we can set for students. The traditional selected response format (MCQ) is associated with convergent responses, that is, all students are expected to provide the same (correct) response. This is true for the question as illustrated in Figure 4.
However, as we have provided students with a tool that allows them to explore the relationship between structure and activity, we could reframe this question to require a divergent response; different students could provide different, equally valid, responses. If we asked the students to design a molecule that had specific properties, for example, a TPSA value between 15 and 17, then students would need to be familiar with the relationship between structure and the property being investigated, and they are able to demonstrate that understanding by designing their own molecule. In this case, the students’ responses would be assessed by a teacher, rather than the computer. Students can also test their own understanding of the key concept being tested here by changing the structure of the molecule and examining the resultant effect on the physical or biological properties. This activity would facilitate the development of self-review skills in students; by providing students with tools to test their own levels of understanding we would be reducing their dependency on teachers, and having to wait to receive feedback about whether they have an adequate understanding of the key concepts.

Figure 5 provides a brief explanation of how the Java applet is embedded in the Moodle question. From the student’s perspective the tool is accessed by a simple click of the linked term ‘titration tool’; the Java applet resides on a local server and a web page has been created with the html code as indicated in the Figure.
The student uses the Java applet to run a simulation of the titration using the data given in the Moodle question. In order to simplify the technical requirements for using the Java applet, in this case the output from the Java applet is not automatically linked to the Moodle quiz answer field and the student must type in their response. It is possible to code for the response to be automatically transferred from the Java applet to the Moodle answer field, but this adds an addition resource and impediment to teachers using the tool.

**Figure 5. Example of Java applet simulation embedded in an e-assessment question.**

**Use of QuickTime VR images for interactive e-assessment**

Java applets are not the only digital tools that can facilitate the construction of sophisticated e-assessment tasks. Other examples of relevant digital tools include the use of Excel spreadsheets with embedded macros, Flash simulations and QuickTime VR images. The Fellowship website contains many examples of digital tools that teachers may use. ([http://www.transformingassessment.com](http://www.transformingassessment.com))

3D images, where students can examine the relative spatial orientations of objects within the image, allow more sophisticated questions to be set in the online environment. An example of the use of a QuickTime VR image incorporated into a selected response question in a typical LMS is illustrated in Figures 6 and 7. In Figure 6 the student is being asked to construct a response to a typical essay-type question but has also been asked to justify their response by choosing relevant scenes from the Bayeux Tapestry presented in the form of an interactive QuickTime VR image. In Figure 7 the student is being asked to examine the volcano and identify particular geological features. Although this example is quite simple, the
teacher could create a series of nested selected response questions that require the student to move around the 3D image of the volcano and identify objects that have specific spatial relationships to each other. This type of assessment task would not be possible with a static image of a site. Other examples of useful QuickTime VR images would be complex 3D images of anatomical or biological specimens, molecular structures, engineering sites, archaeological sites, museums, landscape features or architectural plans for buildings.

Figure 6. Example of QuickTime VR image embedded in an e-assessment question.
Use of virtual or remote laboratories and field trips

Computer-based laboratory activities and field trips are associated with two distinct formats; one involves simulations that are entirely virtual and designed to provide students with a finite range of options for the manipulation of virtual data or objects; the other involves the manipulation of real objects or viewing real physical sites using the Internet for remote access. Both formats are useful as either replacements or complements to real physical activity or the physical presence of a student at a specific location. Students can be given access to remote laboratories or field sites where they can download data to their local computer from a remote sensor for use in assessment tasks. This process allows students to collect and analyse authentic data which means that the assessment tasks can include requirements for students to reflect on the real life consequences of their solutions to the task (http://www.real.msu.edu). This is a particularly useful learning space for science and engineering disciplines since access to many relevant and authentic laboratory sites may be impossible because of cost or safety reasons.

There are continuing discussions on the efficacy of virtual or remote laboratory sessions compared to haptic experiences in terms of student learning outcomes (Murray, Lowe, Lindsay, Lasky, & Liu, 2008). The International Journal of Online Engineering (iJOE) published an interesting series of papers on remote engineering and virtual instrumentation in a special edition in 2009 (http://www.online-journals.org/i-joe/). Virtual laboratory sessions are often used as formative activities to ensure that students are adequately prepared for engaging in a summative, hands-on laboratory session. This use of computer simulations is less controversial.
than the complete replacement of hands-on laboratory sessions with virtual activities, although simulations can be an appropriate replacement for experiments that pose an unacceptably high safety risk for novice students. Virtual simulations can also be used to provide students with a versatile environment in which to test hypotheses and to engage in ‘what happens if I do this …’ type of activity. This experiential learning environment is aligned with a more constructivist approach to learning and teaching. Simulations can also allow students to show their level of competence in using expensive equipment where it may be inappropriate to use the real equipment for assessment purposes.

An example of a remote laboratory experiment embedded into a Moodle quiz is shown in Figure 8. In this example the student is actually manipulating real equipment at a remote site; from the student’s perspective it does not make any difference whether the piece of equipment is in the same room or across the globe: the data output is the same and the data is real. The difference, of course, is that the student did not have to set the equipment up so the issue for the teacher is to decide what is the primary learning outcome that is being assessed here? Remote laboratory experiments are not suitable if the primary learning outcome is the ability to physically set the equipment up so that it functions appropriately. However, remote laboratories may be appropriate if the primary learning outcome is the ability of the student to manipulate equipment to collect data and subsequently analyse this real data as opposed to artificial data as provided from a textbook.

Figure 8. Example of a remote laboratory experiment embedded into a Moodle quiz.
Instead of having to decide between virtual, remote or real laboratory sessions, teachers may prefer to have options available for students within an integrated approach to the practical requirements for a course. An example of such an approach is demonstrated in the Trilab project (http://www.ilough-lab.com) which offers students a holistic laboratory experience that incorporates activities from all three session formats; Trilab requires students to complete virtual, remote and real activities although the format could be adapted to provide options for teachers and students (Abdulwahed, Nagy, & Blanchard, 2008). Similar, but not identical, learning outcomes are observed from students who have completed remote laboratory sessions compared to students who have completed hands-on sessions (Nickerson, Corter, Esche, & Constantin, 2007; Corter, Nickerson, Esche, Chassapis, Im, & Ma, 2007).

Although some virtual and remote laboratory experiments require students to download specialist software to their computers, many computer-based activities require only a recent version of a standard web browser using standard plugins. The JISC-funded RATATAT project (Remote Access to Academic Trials and Testing) is demonstrating how Web 2.0 technologies can assist students’ use of the Internet to complete remote laboratory assessment tasks (http://ratatat.pbworks.com). The integration of virtual or remote laboratory sessions with the collaborative tools of the Web 2.0 environment facilitates group and project work. This integration would transform the nature of laboratory sessions in higher education by enabling student participation in larger, more complex projects that could assess many higher level capabilities.

The online 3D virtual field trip system developed by Lin and Chang (2009) is an example of an integrated learning and assessment model for remote field trips. It incorporates four components, including a streaming video server, the use of instant messaging, an automatic marking and feedback system and a dedicated website for student access to the resources. Assessment tasks are linked to specific video sequences or objects in the virtual environment; selected response items will provide feedback to students. Students are able to capture still images from the video sequence and incorporate these into constructed responses. Although this type of integrated approach is still novel, it illustrates well the possibilities for new virtual and remote learning and assessment spaces that offer new experiences for students and allow teachers to assess higher level skill and capability development.

Use of virtual worlds for assessment

Second Life is a well recognised example of a 3D online virtual world that has seen a rapid uptake in many educational institutions (Linden Lab, http://lindenlab.com; http://www.secondlife.com). Second Life and Active Worlds (http://www.activeworlds.com) represent variations of multiuser online role plays; these environments allow participants to take on a persona in the form of an avatar in order to explore or create digital objects and complete tasks as an individual or in a collaborative manner. Virtual worlds have a significant potential to facilitate authentic learning and assessment, but often require professional expertise to create the high quality digital artefacts that are seen in many of the more complex online environments. There are a number of commercial and open source software packages for constructing virtual worlds, including Second Life, Active Worlds, OpenSimulator, OLIVE, Multiverse and QWAQ. The JISC ‘Serious Virtual Worlds’
report contains a comprehensive list of recent virtual world platforms (de Freitas, 2008).

Designing an effective virtual world experience will require considerable time allocation from the teacher, initially for conceptually aligning the required learning outcomes with the actual activities and assessment tasks students will undertake in the virtual world, and then for the construction of the aligned environment. If teachers do not have access to professional assistance they will need to allocate enough time to develop sufficient skills to be able to construct dwellings and objects that students can use, or set learning and assessment tasks where students develop these skills and build their own virtual environments.

Virtual worlds can be designed so that participants, through their avatar, will meet and interact with other avatars as well as explore and create objects that develop particular capabilities relevant to the learning objectives for a course. Items in virtual worlds can be linked to resources on external web pages as well as external wikis, blogs or discussion boards, where students can assemble evidence of their learning (Hobbs, Brown, & Gordon, 2009).

Teachers can use the methodologies associated with experiential learning and task-based learning in order to design appropriate activities for virtual worlds; some of these methodologies can involve the use of podcasts, wikis, blogs, discussion forums, self and peer review and e-portfolios. Activities in virtual worlds generally emphasise performance rather than information; authentic assessment activities in these environments are therefore going to involve criteria relevant to these performances, rather than the recall or manipulation of content knowledge in isolation from context (Richardson & Molk-Danielsen, 2009; de Freitas & Neumann, 2009).

Most assessment tasks are set outside of the virtual world, even when much of the student learning takes place within this environment. Even though links may be provided within the virtual world to assessment tools such as wikis, blogs, discussion forums and e-portfolios, these tools cannot provide automatic feedback to students in response to the actions of their avatar. Scripting languages within the virtual world software allow developers to create interactive activities and feedback to students, but mastering the use of the scripting language is a professional activity that takes time, frequently more time than most teachers would be able to allocate in order to construct appropriate assessment tasks and feedback for their students. What is needed by teachers, in addition to ready access to Web 2.0 tools, is a set of sophisticated quiz and survey tools within the virtual world, similar to those embedded in many learning management systems. An example of a simple version of such a tool is quizHUD (http://quizhud.avid-insight.co.uk) which has been developed for use in Second Life (Bloomfield & Livingstone, 2009). This tool integrates common selected response items from Moodle into Second Life so that an avatar can answer questions at key points within the virtual world. The question types are familiar to the student and allow the student to be tested within the virtual world, rather than outside it; the assessment tasks are seen as part of the activities within the virtual world. The advantage of quizHUD, from the teacher's perspective, is that no knowledge of scripting is required; teachers can create assessment items in a familiar format just as they would in their learning management system. Each student interacts individually with the quiz, even when multiple avatars are interacting within the virtual world. An example of an avatar interacting with quizHUD in Second Life is shown in Figure 9.
An example of a quiz and survey tool that can be used within Second Life and OpenSim is SLOODLE (http://www.sloodle.org). This tool integrates common selected response items from Moodle into Second Life or OpenSim so that an avatar can answer questions at key points within the virtual world (Kemp, Livingstone, & Bloomfield, 2009). SLOODLE offers a variety of 'in world' learning and assessment activities, including the Quiz Chair (selected response questions presented from Moodle quiz tool), the Web-intercom (chat facility that can be archived in Moodle), the Distributor (vending machine distributing content from Moodle), the Choice tool (archiving voting in Moodle), the Postcard Blogger (students take screenshots of their activity 'in world', annotate with text and upload to Moodle blog) and the Awards tool (presentation of Moodle grades 'in world'). The SLOODLE system is an interesting example of linking various tools available in a learning management system with a virtual 3D world so that students do not have to move in and out of various online environments.

In Figure 10 we have an example of the use of the Sloodle Quiz Chair to link selected response questions from Moodle into Second Life. When the avatar sits on the Quiz Chair the Moodle quiz starts in Second Life. In this particular case we have also coupled the activity with access to an external Java applet, the interactive Periodic Table that the student (through their avatar) can use during the quiz. This is an example of combining freely available resources that currently exist to construct more engaging assessment tasks for students. These tools still require a significant amount of time to master in order to incorporate them into assessment tasks, but they demonstrate the potential of assessing students within 3D virtual worlds.
In Figure 11 we also have an example of the use of the Sloodle Quiz Chair to link selected response questions from Moodle into Second Life. When the avatar sits on the Quiz Chair the Moodle quiz starts in Second Life. In this particular case we have also coupled the activity with access to a slide show on the wall of the room in Second Life where the student (through their avatar) can access additional information during the quiz. Again, this is an example of combining freely available resources to construct more engaging assessment tasks for students.
Use of augmented reality for assessment

An interesting emerging technology is that of augmented reality; here participants are immersed in an environment containing elements from the real physical world and the digital world (Zhou, Duh, & Billinghurst, 2008). Augmented reality (AR) uses a physical device to connect the user with the virtual world, often in the form of a haptic device or head-up or head-mounted display. This type of educational space is relatively new and is often used in disciplines such as medicine, engineering and flight or military simulations. AR has the potential to incorporate digital location data, contextual information or historical data into a real object, allowing students to interact at a much deeper level with an activity. AR has significant potential to influence assessment spaces by providing students with a more realistic environment in which to test their capabilities and decision making. Teachers would be able to track student activity in an AR environment and obtain a detailed synopsis of key decision making points that could be used to make inferences about the strategies students used at these learning moments. The use of AR is still experimental in most educational institutions and the mainstream incorporation of AR into common teaching and assessment environments is still a number of years in the future.

Figure 12 illustrates an example from the http://www.transformingassessment.com website where a very simple AR chemistry experiment has been embedded into a Moodle quiz. This is just a proof-of-concept example and is not meant to be a model question. The student would have a set of pre-cut cards as shown in the bottom left of Figure 12 which are coded to represent specific images. When these cards are placed in the view of a webcam attached to the computer, a representation of the chemical components for the reaction would appear on the computer screen (bottom right of Figure 12). The student could rotate or move this 'on screen' representation by moving their piece of card. Students could test reactivity patterns by bringing two cards together in the field of view of the webcam and the software...
associated with this application would convey either a reaction or no reaction, depending on the combination of components the student chose.

Figure 12. Example of augmented reality technology embedded into a Moodle quiz.

Figure 13 shows another AR example where the card being held by the person is a representation of a car which has been divided into its main components. By rotating the card the person can rotate the image on the computer in real time.
Role-plays and scenario-based activities for assessment

Role-plays can be similar to the activities undertaken in virtual worlds, but the student normally takes on a persona as defined by the teacher and responds to a scenario as that persona. Although the outcomes from a role-play are not usually predetermined, the teacher would normally prescribe the characteristics of the various personas that students would take on and also the tasks to be undertaken within the exercise. Role-plays require divergent, constructed responses where students reflect on the consequences of their actions within the virtual environment. Even though an individual role-play will have the same starting point and commence with the same set of teacher-supplied documentation, the direction taken within the role-play can vary significantly as new groups of students will take the interactions and discussions in different directions. As for virtual worlds, role-plays tend to emphasise a student’s performance rather than their acquisition of knowledge or factual information; they also tend to revolve around complex problems that do not have a prescribed solution. Role-plays allow students to explore the complexities of an issue and the need to consider the consequences of any solution to a problem from multiple perspectives. The assessment of scenario-based learning has much in common with that of role-plays, and should be closely aligned with rewarding the development of those skills and capabilities that are valued, not just those amenable to quantitative measurement.

Role-plays do not necessarily require specific software and all major learning management systems have discussion boards, group features and email facilities that enable online role-plays to be conducted relatively easily. Examples of role-plays performed within Moodle and Blackboard are available from the AUTC project site on ICT-based learning designs (http://learningdesigns.uow.edu.au) and the ALTC project EnRoLE website (http://www.uow.edu.au/cedir/enrole).

The assessment of an online role-play can be conducted using familiar Web 2.0 tools such as wikis, blogs, discussion forums and e-portfolios. Again, the assessment tasks need to reflect the capabilities that are being developed within the role-play. If the acquisition of content knowledge is the key learning objective for the activity, then a role-play is unlikely to be the appropriate space within which to develop and assess this capability. If the capabilities to be developed are around
decision making, analysing the consequences of a solution from multiple social, political or cultural perspectives, negotiating outcomes with others or resolving conflicts in group situations, then a role-play is likely to be an appropriate learning and assessment space.

Whereas in a role-play the student takes on a persona and their behaviour is based on their perceptions of how that persona might act in a particular context, in scenario-based learning the student will normally behave as herself or himself, and act as they believe they should in the context presented. Scenario Based Learning Interactive (SBLi) is an example of software designed to facilitate the creation and delivery of scenarios for problem-based learning or enquiry-based learning (http://www.sblinteractive.org). An example of the use of SBLi software to construct a prescribed virtual laboratory scenario in genetics was published by Breakey, Levin, Miller and Hentges (2008); in this use of scenario-based learning the students are expected to develop capabilities in determining inheritance patterns and conducting standard screening tests. Scenario quiz questions were used as navigation tools in this particular implementation of the scenario, with students progressing through the scenario as they responded to the questions. As with role-plays, scenario-based activities do not necessarily require specific software as all of the major learning management environments have sufficient collaboration and communication tools to support group work and the documentation of reflective practice outcomes.

Figure 14 shows an example of a SBLi activity; the student would commence by clicking on icons in the location window (top left in Figure 14) and instructions and activities would appear in the content and action windows. Students can be asked questions and their reflections as they work their way through the scenario and this would form part of the assessment for the task. The teacher receives a report that documents each screen the student visited, any responses to embed questions and any text reflections or rationales that the student has completed (right in Figure 14).
Figure 14. Example of scenario-based activity.

Serious or educational games in assessment

The term serious games is used in order to distinguish between digital games whose primary purpose and market is leisure-based, and those that are designed for education and training (Aldrich, 2009). Prensky (2001) was an early advocate of the use of computer games in education and training, including games to raise social awareness, to run businesses and to train military personnel.

It is worth reflecting on the characteristics of well-designed games: there is an emphasis on interactivity, they contain appealing multimedia sequences and have a clearly articulated set of goals and rewards. The player develops skills as they proceed through the game, is provided with constant feedback in response to particular actions and is rewarded at regular, pre-defined milestones. Communities of practice evolve around how to master the skills and capabilities that are required to reach the new levels in the game and to attain the final goal or complete the mission. Each player will take a different path on their journey and make mistakes for which they will receive timely feedback in order to improve their performance. All of these characteristics could be used to describe an effective learning environment in higher education.

Assessing game-based learning will follow the same general principles outlined for virtual worlds, role-plays and scenarios. If the key learning outcomes for a course involve the development of specific skills, then drill and practice activities in a game will generally lead to improvements in those skills (Hong, Cheng, Hwang, Lee, & Chang, 2009). Examples would be upgrading a licence for machinery operators, music theory, language practice or simple maths skills. Such games tend to have
the assessable components embedded within the game, often using a simple form of adaptive release to guide players through the game towards the goal.

Although quizHUD and Sloodle are good examples of the integration of an assessment tool within a virtual world or game, a more sophisticated approach would be to incorporate an evidence-centred assessment tool that allowed data to be collected about the strategies students used to move through the virtual world or game while engaging with a sophisticated task. This data could then be analysed by an appropriate algorithm and provide teachers with a map of the student’s journey that could be translated into a mark or grade. The embedded assessment engine should be capable of providing timely feedback to students and even allow students to modify their strategies based on the feedback received. Stealth assessment has been the term introduced to describe the unobtrusive collection of data about the student and the automated scoring of this data for assessment purposes (Shute, 2011). This is particularly relevant to serious games where the performance of the student is often more important than the accumulation of isolated content knowledge. The development of effective behaviours and strategies by the student needs to be assessed in these virtual environments and more sophisticated assessment and feedback tools embedded into the software so that teachers do not have to spend significant amounts of time learning to script or program assessment tasks and feedback.

Educational game design requires that both the learning and assessment activities are constructed concurrently, not sequentially; an evidence-centred approach to assessment design is required so that there is alignment between the skills being developed through the learning activities and the skills required to efficiently complete the assessment tasks.
References


Fellowship outputs


Fellowship evaluation – executive summary

This report summarises the findings of the external evaluation of the attainment of the aims and goals of the ALTC Fellowship program of activities conducted by Professor Geoff Crisp. The Fellowship program sought to investigate and increase the capacity of Australian academic staff to align teaching, learning and assessment practices in a Web 2.0 environment.

1.1. The ALTC Fellowships Scheme
Professor Crisp was awarded a National Teaching Fellowship in 2009 and began to undertake the planned program of activities in September 2009.

1.2. Evaluation of the program of activities
The evaluation focused on gathering evidence of the attainment of the aims and goals of Professor Geoff Crisp’s ALTC Fellowship program. Professor Crisp approached Deanne Gannaway to act as the external evaluator in September 2009. The evaluation was conducted between March 2010 and October 2011. This external evaluation adopted the CIPP Evaluation Model (Stufflebeam 2000) which examines the context, input, process and product in order to measure the success of a program. In keeping with this model, the evaluation strategy provided formative feedback regarding the effectiveness of the Fellowship program in achieving the key objectives as they are set out in the proposal document at various stages across the life of the Fellowship.

1.3. Key findings from the evaluation
This Fellowship scheme has met the subsidiary aims and objectives of the ALTC fellowship scheme. Further, for the most part, the Fellowship has met the initial objectives outlined in the proposal and moved beyond those proposed in response to the needs identified across the life of the program. While the purpose of the ALTC Fellowship is to provide leadership in a particular area, the unique feature of this program has been the fact that the program has ensured that the locale of expertise does not reside solely in Professor Crisp, but in the collective skill base and intellect drawn on by the Fellowship program. In addition, the work plan has resulted in unanticipated benefits that may have use beyond the scope of this project.

The evaluation team identified features of the program that filled the criteria of the CIPP model:

1. Context evaluation assesses the needs, capacities and problems within a defined environment
   - There appeared to be a clear need for the program of activities planned for the Fellowship
   - The target audience for the program of activities was diverse in terms of experience, expertise and capacity to adopt
   - The capacity of participants to change practices during the time period of the fellowship is limited.

2. Input evaluation assesses the work plans and budgets of the selected approach.
   - The program progressed according to work plans
   - The communication strategy adopted was a powerful mechanism of raising awareness
   - The webinars were positively received by the targeted audience
   - Tracking actual participants in the webinars is difficult, making measuring potential impact of the webinars in the long term difficult to monitor
   - The program of activities was responsive to feedback from the target audience.

4. Product evaluation assesses the reach of the program to the target audience; assesses the quality and significance of outcomes; assesses the extent to which a program's contributions are successfully embedded and have the potential to be continued over time; and the extent to which program outcomes have (or could be) successfully adapted and applied elsewhere.
   - The program of activities facilitated multiple opportunities for engagement
   - The range of activities shows a breadth of engagement with the target audience
   - The Fellowship had national and international reach
   - The webinars had a high level of engagement
   - Fellowship activities had been having an impact in the target population.
   - The program’s contributions have the potential to be continued over time
   - The abandonment of development of a formal community of practice was appropriate
   - There is evidence that the program outcomes have or have the potential to be upscaled.

1.4. About the report
This report provides an overview of the evaluation approach and then provides an overview of the activities conducted as part of the Fellowship. Evaluation findings are grouped according to the CIPP model; describing observed outcomes according to context, input, process and product. Product is reviewed in terms of potential impact, effectiveness, sustainability and transportability. Concluding remarks are offered regarding an assessment of the program’s contributions, strengths and weaknesses before offering an overview of possible further evaluation efforts needed that may inform future activities, conducted by either Professor Crisp or others.

1.5. Acknowledgements
The Evaluation team would like to gratefully acknowledge the contribution of the many informants towards the development of this report: the members of the program reference committee; program support staff; webinar participants and presentation organisers. Your input towards developing an understanding of the potential impact and contribution of the program's activities towards e-Assessment in a Web 2.0 environment has been invaluable.

1.6 The evaluators
Professor Crisp approached Deanne Gannaway to act as the external evaluator in September 2009. An evaluation proposal was prepared and accepted by March 2010 and the evaluation commenced in April 2010, when Karen Sheppard joined the evaluation team as project manager.

Deanne Gannaway BA HDipEd (Wits), MEd (USQ)
Deanne Gannaway is the Manager of the Evaluations Unit in the Teaching and Educational Development Institute (TEDI) at the University of Queensland. Her research interests focus on the development of educational evaluation and enhancement of higher education curriculum. Deanne is frequently called on to offer
advice on appropriate evaluation approaches and methods for large scale teaching and learning projects and curriculum based activities. Deanne has been actively involved in a number of national teaching and learning funded projects. Most recently, she led the nationally funded evaluation of the dissemination strategies used in the Australian Learning and Teaching Council (ALTC) grants schemes, *A Review of the Dissemination Strategies used by Projects Funded by the ALTC Grants Scheme*. This project built on the research completed in 2004 for the nationally focused, DEST funded research project on dissemination strategies for innovation project outcomes which directly influenced the grant schemes and processes developed by the ALTC. She was also the principal investigator on the ALTC funded project *Nature and Roles of Arts Degrees in Contemporary Society* and has been a key participant in a number of other education evaluation activities with a focus on higher education. She has also been commissioned as the external evaluator on a number of large scale ALTC funded projects and fellowship programs.

Karen Sheppard BA (UWA), Dip. Ed. (WACAE), M Ed (Professional Education and Training) (Deakin)
Karen is a research assistant in the Teaching and Educational Development Institute (TEDI) at the University of Queensland. She has recently worked on the nationally funded evaluation of the dissemination strategies used in the Australian Learning and Teaching Council (ALTC) grants schemes, *A Review of the Dissemination Strategies used by Projects Funded by the ALTC Grants Scheme*, and on a range of institutional projects evaluating the impact of teaching innovations on student learning.
# Fellowship events

Please note:
Events coded GREEN are presentations given at universities and conferences by Geoffrey Crisp.
Events coded YELLOW are presentations given by contributing academics as part of the Transforming Assessment webinar series ([http://www.transformingassessment.com](http://www.transformingassessment.com)).

<table>
<thead>
<tr>
<th>Event date</th>
<th>Event title, Location (city only)</th>
<th>Brief description of the purpose of the event</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>28/01/10</td>
<td>Assessment 2.0. Brief presentation from Professor Geoff Crisp at the SBLi forum in Brisbane.</td>
<td>Brief presentation on Assessment 2.0 at SBLi forum.</td>
<td>25</td>
</tr>
<tr>
<td>26/02/10</td>
<td>Assessment 2.0: Assessment in an interactive, participatory and distributed environment. Workshop facilitated by Professor Geoff Crisp at Design for Learning Conference, La Trobe University, Melbourne, Australia.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>17/03/10</td>
<td>Assessment 2.0: Assessment in an interactive, participatory and distributed environment. Seminar facilitated by Professor Geoff Crisp at Open University, UK.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>21/03/10</td>
<td>Assessment 2.0: Assessment in an interactive, participatory and distributed environment. Seminars facilitated by Professor Geoff Crisp at John Moores University, Liverpool, UK.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>22/03/10</td>
<td>Assessment 2.0: Assessment in an interactive, participatory and distributed environment. Seminar facilitated by Professor Geoff Crisp at the Rethinking assessment: Assessment 2.0 event, University of Strathclyde, Glasgow, UK.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>30/03/10</td>
<td>Assessment 2.0: Assessment in an interactive, participatory and distributed environment. Seminar facilitated by Professor Geoff Crisp at Charles Darwin University, Australia.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>12/05/10</td>
<td>Why should we change assessment because of Web 2.0? Online seminar facilitated by Professor Geoff Crisp.</td>
<td>To present an overview of the changes in the student learning environment afforded by Web 2.0 and to discuss why assessment practices need to change in response to these new learning environments.</td>
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<tr>
<td>26/05/10</td>
<td>Assessing student's Web 2.0 activities. Online seminar facilitated by Dr Kathleen Gray and Dr Jenny Waycott (University of Melbourne, Australia).</td>
<td>To present the findings from an ALTC project into assessment practices surrounding student Web 2.0 activities covering current assessment practices, the nature of assessment activities being undertaken and implications for assessment policy going forward.</td>
<td>38</td>
</tr>
<tr>
<td>08/06/10</td>
<td>Assessment of capstone courses. Online seminar facilitated by Margot McNeill (Macquarie University, Australia).</td>
<td>To present two case studies of capstone courses at Macquarie University, Australia which used a range of technologies to support and assess complex learning in different domains.</td>
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<tr>
<td>23/06/10</td>
<td>Assessing online discussions. Online seminar facilitated by Bobby Elliott (Scottish Qualifications Authority, UK).</td>
<td>To present an outline of best practice in the construction of online assessments based upon a review of the current literature relating to the assessment of online discussions and evaluation of the rubrics currently used to grade student contributions.</td>
<td>28</td>
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<tr>
<td>06/07/10</td>
<td>Assessment 2.0 – updating your assessment practices. Workshop facilitated by Professor Geoff Crisp at the HERDSA Conference in Melbourne, Australia.</td>
<td>To enable workshop participants to explore Assessment 2.0 options relevant to their teaching. Participants will review the characteristics of Web 2.0 affordances and determine which ones are appropriate for their discipline areas. In conclusion, participants will plan a series of assessment activities based around Elliott’s Assessment 2.0 characteristics.</td>
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<tr>
<td>04/08/10</td>
<td>Augmented reality in education. Online seminar facilitated by Professor Bruce Thomas (Wearable Computer Lab, University of South Australia, Australia).</td>
<td>To present an overview of what augmented reality is and how it can impact on the learning process.</td>
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<tr>
<td>09/08/10</td>
<td>Best practice in higher education assessment: Addressing the intersection between curriculum design and assessment design. Seminar facilitated by Professor Geoff Crisp at the Faculty of Health, Queensland University of Technology, Brisbane, Australia.</td>
<td>To present relationship between learning and online assessment.</td>
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<td>18/08/10</td>
<td>eMarking tools and processes. Online seminar facilitated by Dr Peter Evans (University of Southern Queensland, Australia).</td>
<td>To present how e-marking tools can be used by teachers to provide detailed, useful and timely feedback on electronically submitted written assessments such as essays and reports.</td>
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<tr>
<td>23/08/10</td>
<td>e-Assessment. Seminar facilitated by Professor Geoff Crisp at Center for Advancement of Higher Education (CAHE) Tohoku University, Sendai, Japan.</td>
<td>To present Assessment 2.0 seminar.</td>
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<tr>
<td>08/09/10</td>
<td>Assessment and problem-based scenarios. Online seminar facilitated by Dr Terry Stewart (Massey University, New Zealand).</td>
<td>To present example lessons that illustrated different assessment techniques using 'SBL interactive' an authoring and delivery tool specifically for problem-based scenarios.</td>
<td>42</td>
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<tr>
<td>14/09/10</td>
<td>Assessment 2.0 – assessment in an interactive, participatory and distributed environment. Seminar facilitated by Professor Geoff Crisp at University College London, Centre for the Advancement of Learning and Teaching (CALT), London, UK.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>17/09/10</td>
<td>e-Assessment. Seminar facilitated by Professor Geoff Crisp at Anglia Ruskin University, Cambridge, UK.</td>
<td>To present overview of Assessment 2.0 to the central academic development group of the university.</td>
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<tr>
<td>23/09/10</td>
<td>Assessment 2.0 – assessment in an interactive, participatory and distributed environment. Seminar facilitated by Professor Geoff Crisp at Interactive e-assessment and assessment in the Web 2.0 environment seminar at the University of Edinburgh, Edinburgh, UK.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>01/10/10</td>
<td>Assessment 2.0: Assessment in an interactive, participatory and distributed environment. Keynote presented by Professor Geoff Crisp at FaST Science Educators’ Symposium Program – Queensland University of Technology, Brisbane, Australia.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>12/10/10</td>
<td>Assessing learning through role-based eLearning. Online seminar facilitated by Dr Elyssabeth Leigh (University of Technology Sydney, Australia) and Elizabeth Rosser (University of New South Wales, Australia).</td>
<td>To present an overview of online role playing from a variety of perspectives using online role plays as part of the seminar.</td>
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<td>14/10/10</td>
<td>Game-based learning and assessment. Online seminar facilitated by Professor Sara de Freitas (Coventry University, UK).</td>
<td>To present an overview of the state of play in the serious games arena including results of research into game playing demographics, learning approaches and preliminary results of the impact of using game based learning on learning outcomes.</td>
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<tr>
<td>27/10/10</td>
<td>Assessment of game-based learning. Online seminar facilitated by Dr Nicola Whitton (Manchester Metropolitan University, UK).</td>
<td>To present possible roles for game based learning in education and issues of developing appropriate assessment for and in conjunction with games in teaching situations.</td>
<td>25</td>
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<tr>
<td>02/11/10</td>
<td>Encouraging student action on feedback. Online seminar facilitated by Stuart Hepplestone (Sheffield Hallam University, UK).</td>
<td>To present approaches in order to encourage student engagement with feedback. Includes the learning and logistical benefits of various technological interventions and examples of using a custom 'Assignment Handler building block' within the Blackboard learning management system.</td>
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<tr>
<td>04/11/10</td>
<td>Law debating in virtual classrooms. Online seminar facilitated by Pauline Collins, Lecturer in Law (University of Southern Queensland, Australia) and Peter Evans, Learning and Teaching Support Unit (University of Southern Queensland, Australia).</td>
<td>To present an overview of how Wimba Live Classroom has been used in the Law in Context first year course at University of Southern Queensland (USQ).</td>
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</tr>
<tr>
<td>17/11/10</td>
<td>Mobile eLearning. Online seminar facilitated by Associate Professor David Kennedy (Lingnan University, Hong Kong).</td>
<td>To present an overview of learning activities that can be conducted via mobile devices (mobile phones, iPads etc.) with a particular focus on second language learning courses, the role such devices can play in an overall course design and the challenges faced when implementing mobile learning projects.</td>
<td>18</td>
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<tr>
<td>18/11/10</td>
<td>Assessing students in Second Life with scripted chat-bots. Conference presentation by Geoff Crisp, Shamim Joarder, and Matthew Hillier at the ATN Assessment Conference, Sydney, Australia.</td>
<td>To present a method of constructing simple assessment tasks in the online 'virtual world' of Second Life.</td>
<td>25</td>
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<tr>
<td>25/11/10</td>
<td>Assessment 2.0 – assessment in an interactive, participatory and distributed environment. Seminar facilitated by Professor Geoff Crisp at University of Newcastle, Newcastle, Australia.</td>
<td>To examine some of the opportunities currently available for academics designing Assessment 2.0 tasks. Secondly to explore some of the design principles that will be required to align learning and assessment.</td>
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<tr>
<td>30/11/10</td>
<td>Assessment in Second Life with SLOODLE. Online seminar facilitated by Dr Daniel</td>
<td>To present an overview of how SLOODLE can support a range of formative and summative assessments in a virtual world.</td>
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<td></td>
<td>Jack Livingstone (University of the West of Scotland, Paisley, Scotland, UK).</td>
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<tr>
<td>02/12/10</td>
<td>Effective electronic feedback to students. Online seminar facilitated by Dr Denise</td>
<td>To present issues relating to the provision of effective electronic feedback to students including automated feedback on ‘free text’ answers (using Open Comment), feedback for tutors (using Open Mentor) and supporting each other with collaborative feedback and advice for future action.</td>
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<td></td>
<td>Whitelock (Open University, UK).</td>
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<tr>
<td>05/12/10</td>
<td>Teaching and learning in virtual worlds: Is it worth the effort? Symposium</td>
<td>To explore the affordances and issues associated with teaching and learning in virtual worlds, all the time considering the question: is it worth the effort?</td>
<td>30</td>
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<td></td>
<td>presented by Helen Farley, Sue Gregory, Allan Ellis, Geoffrey Crisp, Jenny</td>
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<tr>
<td></td>
<td>Grenfell, Angela Thomas and Matthew Campbell at ASCILITE 2010 Conference, Sydney,</td>
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<td></td>
<td>Australia.</td>
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<tr>
<td>06/12/10</td>
<td>Do online activities inspire students in the science disciplines? Engaging students</td>
<td>To present discussion on the affordances of the online environment in relation to science education and the evidence currently available that suggests the online environment can be used to engage science students.</td>
<td>20</td>
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<tr>
<td></td>
<td>in learning science with online activities: Affordances and limitations. Symposium</td>
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<tr>
<td></td>
<td>presented by Geoffrey Crisp, Kristine Elliott, Garry Hoban, Michael Nott and</td>
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<td>Will Rifkin at ASCILITE 2010 Conference, Sydney, Australia.</td>
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<tr>
<td>07/12/10</td>
<td>Assessing students in Second Life – some options. Paper presented by Geoff Crisp,</td>
<td>To present various options for assessing students within a virtual world such as Second Life.</td>
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<td></td>
<td>Matthew Hillier and Shamim Joarder at ASCILITE 2010 Conference, Sydney, Australia.</td>
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<tr>
<td>15/12/10</td>
<td>Online peer review. Online seminar facilitated by Dr Denise Wood (University of</td>
<td>To present an overview of an online peer review system designed to provide support for self and peer reflection and assessment. Includes the benefits and challenges of self and peer assessment, the strategies found to be effective and the role of the online peer review system in supporting these strategies.</td>
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<td>South Australia, Australia).</td>
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<tr>
<td>04/03/11</td>
<td>Using Teaching Development Grants to Effect Sustainable Change. Keynote presented</td>
<td>To present some of the options for using Teaching Development Grants to effect sustainable change.</td>
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<td></td>
<td>by Professor Geoff Crisp at 334 Symposium – Advancing Teaching and Learning -</td>
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<td></td>
<td>Lingnan University, Hong Kong.</td>
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<td>Date</td>
<td>Event Description</td>
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<td>06/04/11</td>
<td>Self-test exercises as learning tools using Certainty-Based Marking. Online seminar facilitated by Emeritus Professor Tony Gardner-Medwin (University College London, UK).</td>
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<tr>
<td>04/05/11</td>
<td>Introducing the Bridge Support Framework for supporting online assessment. Online seminar facilitated by Janet Buchan (Charles Sturt University, Australia).</td>
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<td>26/05/11</td>
<td>Assessment 2.0: Assessment in an interactive, participatory and distributed environment. Online seminar presented by Professor Geoff Crisp at Hong Kong Baptist University, Hong Kong.</td>
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<tr>
<td>01/06/11</td>
<td>Remix, mash-Up, share: Designing Web 2.0 assessment scenarios and criteria in games and interactive media. Online seminar facilitated by Ingrid Richardson (Murdoch University, Australia).</td>
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<tr>
<td>13/07/11</td>
<td>Electronically-mediated peer assessment: A case study on oral assessment. Online seminar facilitated by Gloria Visintini (University of Bristol, UK).</td>
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<td>21/07/11</td>
<td>Rethinking learning and teaching for the 21st century graduate. Seminar presented by Professor Geoff Crisp at QUT, Brisbane, Australia.</td>
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<td>03/08/11</td>
<td>New paradigms for assessment within image intensive disciplines: Examples from Histology. Online seminar facilitated by Professor Geoff Meyer (University of Western Australia).</td>
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<tr>
<td>04/08/11</td>
<td>Rethinking learning and teaching for the 21st century graduate. Seminar presented by Professor Geoff Crisp at the School of Applied Science, RMIT University, Melbourne, Australia.</td>
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<td>08/08/11</td>
<td>Interactive e-Assessment. Seminar presented by Professor Geoff Crisp at the LLN Strategy Forum (2) Spotlight on Assessment at Victoria University, Melbourne, Australia.</td>
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<td>Date</td>
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<td>07/09/11</td>
<td>Stealth assessment: Embedded evidence-based assessment in games.</td>
<td>Online seminar facilitated by Professor Valarie Shute (Florida State University, USA). To present an overview of how the design and development of evidence-based assessments (embedded in a game) can be used to measure 21st Century competencies.</td>
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<tr>
<td>09/09/11</td>
<td>e-Assessment. Workshop/seminar facilitated by Professor Geoff Crisp at Monash University, Caulfield, Australia.</td>
<td>To present online assessment options to graduate certificate program participants.</td>
<td>20</td>
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<tr>
<td>20/09/11</td>
<td>Assessment in the cloud. Presentation by Professor Geoff Crisp at HERDSA Victoria Branch, Melbourne, Australia.</td>
<td>To present e-assessment options.</td>
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<tr>
<td>29/09/11</td>
<td>Assessment practices in digital learning environments. Workshop/seminar facilitated by Professor Geoff Crisp at National Learning and Teaching Forum, Sydney, Australia.</td>
<td>To present new assessment methods for online environment.</td>
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<tr>
<td>30/09/11</td>
<td>Keynote presentation by Professor Geoff Crisp at the Australian Conference on Science and Mathematics Education Conference, University of Melbourne, Melbourne, Australia.</td>
<td>To present new options for assessing higher level learning using digital tools.</td>
<td>80</td>
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<tr>
<td>05/10/11</td>
<td>OpenLearn - rationale behind the new Moodle 2.1 Quiz. Online seminar facilitated by Phil Butcher (Open University, UK).</td>
<td>To present an overview of the newly developed question engine in Moodle 2.1 as largely developed by Open University.</td>
<td>34</td>
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<tr>
<td>20/10/11</td>
<td>Keynote presentation by Professor Geoff Crisp at ATN Assessment Conference, Curtin University, Perth, Australia.</td>
<td>Keynote presentation at ATN Assessment Conference on game based assessment.</td>
<td>80</td>
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<tr>
<td>02/11/11</td>
<td>e-Assessment and assessing online. Seminar facilitated by Professor Geoff Crisp at Teaching Wednesdays: Sharing Teaching Excellence for Student Learning, University of Adelaide, Adelaide, Australia.</td>
<td>Presentation on assessment options for online education.</td>
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<tr>
<td>09/11/11</td>
<td>Web-based collaborations for undergraduate science experiments: Group and individual assessment. Online seminar facilitated by Brynn Hibbert and Douglas Duffy (University of New South Wales, Australia) and Rosanne Quinnell (University of Sydney).</td>
<td>This session explored how an Electronic Lab Notebook (ELN) developed at Southampton University in the UK, is being implemented at UNSW and a project (funded by the ALTC) that will focus on undergraduate students documenting and sharing their practical work in Chemistry.</td>
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<td>Date</td>
<td>Description</td>
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<td>07/12/11</td>
<td>The eOSCE - streamlining practical skills assessments for large student groups. Online seminar facilitated by Dr Suzanne Snodgrass (University of Newcastle, Australia) and Dr Trevor Russell (University of Queensland, Australia).</td>
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<td>To present an overview of the electronic objective structured clinical examination (eOSCE). The eOSCE aims to provide an alternative to paper-based assessment utilising a personal digital assistant. It is particularly aimed as assessment of student's practical skills in the health professions.</td>
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<td><strong>TOTAL</strong></td>
<td><strong>1493</strong></td>
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</table>
Transforming Assessment webinars

http://www.transformingassessment.com/events.php

There were 540 participants across the webinar series.

Presenters for the webinar series were:

Wednesday 12 May 2010
Why should we change assessment because of Web 2.0?
Professor Geoff Crisp (University of Adelaide, Australia)

Wednesday 26 May 2010
Assessing student’s Web 2.0 activities.
Dr Kathleen Gray and Dr Jenny Waycott (The University of Melbourne, Australia)

Tuesday 8 June 2010
Assessment of capstone courses.
Margot McNeill (Macquarie University, Australia)

Wednesday 23 June 2010
Assessing online discussions.
Bobby Elliott (Scottish Qualifications Authority, UK)

Wednesday 4 August 2010
Augmented reality in education.
Professor Bruce Thomas (Wearable Computer Lab, University of South Australia, Australia)

Wednesday 18 August 2010
eMarking tools and processes.
Dr Peter Evans (University of Southern Queensland, Australia)

Wednesday 8 September 2010
Assessment and problem-based scenarios.
Dr Terry Stewart (Massey University, New Zealand)

Tuesday 12 October 2010
Assessing learning through role-based eLearning.
Dr Elyssebeth Leigh (University of Technology Sydney, Australia) and
Elizabeth Rosser (The University of New South Wales, Australia, Australia)

Thursday 14 October 2010
Game-based learning and assessment.
Professor Sara de Freitas (Coventry University, UK)

Wednesday 27 October 2010
Assessment of game-based learning.
Dr Nicola Whitton (Manchester Metropolitan University, UK)

Tuesday 2 November 2010
Encouraging student action on feedback.
Stuart Hepplestone (Sheffield Hallam University, UK)

Thursday 4 November 2010
Law debating in virtual classrooms.
Pauline Collins, Lecturer in Law (University of Southern Queensland, Australia) and
Peter Evans, Learning and Teaching Support Unit (University of Southern
Queensland, Australia)

Wednesday 17 November 2010
Mobile e-learning.
Associate Professor David Kennedy (Lingnan University, Hong Kong)

Tuesday 30 November 2010
Assessment in Second Life with SLOODLE.
Dr Daniel Jack Livingstone (University of the West of Scotland, Paisley, Scotland, UK)

Thursday 2 December 2010
Effective electronic feedback to students.
Dr Denise Whitelock (Open University, UK)

Wednesday 15 December 2010
Online peer review.
Dr Denise Wood (University of South Australia, Australia)

Wednesday 6 April 2011
Self-test exercises as learning tools using Certainty-Based Marking.
Emeritus Professor Tony Gardner-Medwin (University College London, UK)
Wednesday 4 May 2011
Introducing the Bridge Support Framework for supporting online assessment.  
Janet Buchan (Charles Sturt University, Australia)

Wednesday 1 June 2011
Remix, mash-up, share: Designing Web 2.0 assessment scenarios and criteria in games and interactive media. 
Dr Ingrid Richardson (Murdoch University, Australia)

Wednesday 13 July 2011
Electronically-mediated peer assessment: A case study on oral assessment.  
Gloria Visintini (University of Bristol, UK)

Wednesday 3 August 2011
New paradigms for assessment within image intensive disciplines: Examples from Histology.  
Professor Geoff Meyer (The University of Western Australia, Australia)

Wednesday 7 September 2011
Stealth assessment: Embedded evidence-based assessment in games. 
Professor Valarie Shute (Florida State University, USA)

Wednesday 5 October 2011
OpenLearn - rationale behind some new question types for Moodle. 
Dr Phil Butcher (Open University, UK)

Wednesday 9 November 2011
Web-based collaborations for undergraduate science experiments: Group and individual assessment.  
Professor Brynn Hibbert and Dr Douglas Duffy (The University of New South Wales, Australia) and Dr Rosanne Quinnell (The University of Sydney, Australia)

Wednesday 7 December 2011
The eOSCE - streamlining practical skills assessments for large student groups. 
Dr Suzanne Snodgrass (The University of Newcastle, Australia) and Dr Trevor Russell (The University of Queensland, Australia)
Other dissemination activities

The major output from the Fellowship is the website http://www.transformingassessment.com. This website contains a considerable resource base for e-assessment exemplars and references.

For the period January 2010 – November 2011 the website has been visited up to 58,060 times with 84 average daily visits and 1162 unique average visitors per month.
The ClusterMaps data indicates unique computer access to the website and illustrates the geographical distribution of visitors. This data clearly shows that the website has a global audience.
The Fellowship produced a series of YouTube videos consisting of the webinars and exemplars on e-assessment. The 177 videos featured on the YouTube channel have been viewed 28,641 times (up to 11 November 2011).
http://www.youtube.com/user/transformassessment
Rethinking assessment in the participatory digital world – Assessment 2.0

This island contains examples of how to assess students inside a virtual world such as *Second Life*. 