

On-Line Assessment FOR E-Learning: Options and Opportunities

Why is assessment important for e-learning?

The desire to produce educational multi-media packages of ever greater sophistication is such that other, more problematic, elements of e- or on-line learning receive less attention by academics and courseware developers alike. One such problematic area is that of assessment, which is surprising given that, as Ramsden has succinctly observed “assessment always defines the actual curriculum.”¹ Moreover, e-learning assessment procedures are more critical in defining the learning that takes place because “Coordinators and deliverers of online units of study have a different set of restrictions and advantages compared to the more traditional forms of delivery.”² Hence, Graham argues, e-learning requires two types of feedback, “information feedback” and “acknowledgement feedback.” The former provides information or evaluation, such as an assignment grade and comments, and is also present with face-to-face delivery. The latter “acknowledgement feedback” confirms that an event has occurred – as Graham points out “in a face-to-face course, acknowledgement feedback is usually implicit. Eye contact, for example, indicates that the instructor has heard a student’s comments; seeing a completed assignment in the instructor’s hands confirms receipt.”³ Unlike face-to-face delivery, e-learning courses lack such tacit and latent feedback, which hence has to be supplied by other means – with the tutor ensuring that students are given rapid feedback that (say) the tutor has received an assignment from a student. Regrettably, “neglecting acknowledgement feedback in online courses is common, because such feedback involves purposeful effort.”⁴

However, because e-learning can create a much richer, more varied active learning experience than would normally occur via the passive didactic teaching mode currently utilised in most universities and centred on the use of the lecture, it also has the potential to provide new and innovative assessments modes and systems. Disappointingly, Ryan found that “preliminary searches for good examples of online assessment reveal no mainstream examples of the potential of the new media to construct authentic, valid and meaningful evaluation of the range of student learning ... (but rather) ... a trivialisation of content knowledge, diminished to the level of true/false answers, matching exercises, multiple choice questions of the lowest common denominator level which undermines the very learning that we now all agree is essential for our students”⁵ Some of this lack of innovation in assessment may stem from the need to dispel the perception that elearning is somehow “second class learning.” Hence universities undertaking e-learning assessments will not stray far from the assessment practices of face-to-face traditional teaching as they recognise that “Only by meeting such normal quality standards you will be recognized as being serious and the results of your teaching effort may result in accreditation in the university context.”⁶

The extent to which the potential of innovatory assessment is realised via e-learning depends on two factors. First, the level of computer component and interactivity utilised in elearning. However, as Brennan et al point out “there is a lack of rigour about the definitional base which underpins online delivery,”⁷ such that “‘online’ and ‘virtual’ are used widely and often indiscriminately to describe activities across all education sectors, which involve the use of information communications technology.”⁸ Similarly a review of the e-learning literature by Mason revealed “considerable ambiguity and often contradictory conceptions about what e-learning actually is.”⁹ Hence the use of technology in the learning activities of universities is not absolute but a continuum, along which Harasim has plotted three modes of delivery that distinguish online education:

- ❑ Adjunct mode - uses networking to enhance traditional face-to-face or distance education.
- ❑ Mixed mode - employs networking as significant portion of a traditional classroom or distance course.
- ❑ Totally online mode - relies on networking as the primary teaching medium for an entire course or program.¹⁰

The infancy of elearning is such that the optimal use of technology to maximise student learning has yet to be established. However, an attempt to define the *Ideal Online Course* identified the following elements:

- ❑ A blend of appropriate delivery media including a study-guide and printed textbook;
- ❑ The use of assignments to provide contexts for learning;
- ❑ Provision for collections of student work and examples on-line;
- ❑ The use of all possible forms of communication to connect learners and their tutors;
- ❑ Activities that support interactive skill building, not simply information searching and acquisition;
- ❑ Support for learner engagement capable of adaptation to suit the individual learners.

This analysis confirmed the importance of assessment in the process of e-learning by stating that "The ideal online course is centred on the set of student tasks ... that constitute the learning experiences that the students will engage in ... in order for them to master the objectives of the course."¹¹

The second factor defining the extent to which the innovative potential of assessment via e-learning is realised is the attitude of academic staff towards their teaching role, and, more specifically, how they operate within an elearning environment. The tendency for university lecturers to concentrate on research rather than teaching is probably the norm, especially where institutional cultures emphasise the Humboldtian function of universities - as Moses' extensive study revealed, "Even in some departments whose orientation was perceived to be strongly towards teaching and not towards research, there was no evident encouragement of excellence in teaching."¹² Hence there is a continuing emphasis on research and publications, rather than teaching, as a means of career progression. MacFarlane points to the crux of the matter: "The greatest challenge is to persuade a majority of those involved in higher education to see teaching as their prime activity, posing intellectual challenges and offering rewards comparable to those of standard research."¹³

Even when staff acknowledge the need to balance teaching and research, they may neither wish to change their mode of teaching, nor recognise that they need training to accommodate the demands of e-learning. As Collis notes "the individual faculty member in a traditional European higher-education institution, with probably many years experience in teaching her or his courses, may not be convinced of the immediate need or feasibility of changing his or her own way of teaching, of organising his or her courses, of lecturing, handling student assignments, or giving examinations. The faculty member quite sensibly may be skeptical of general statements indicating that he or she should change his or her way of teaching. ... Many academics feel strongly that the ways they have always taught are in fact the appropriate ways to teach their own disciplines; change for abstract reasons such as the future of the university does not weigh heavily enough to convince them to teach in what they feel will be an 'inappropriate way' for their course and habits."¹⁴ Moreover, university lecturers view themselves as professionals with responsibility for determining and meeting their own professional needs for development. As Lewis Elton has wryly noted "it is one of the paradoxes of academia that while universities provide training and development for every other profession, there is a reluctance for academics to recognise the need for it for themselves."¹⁵

Even when staff attempt to get to grips with elearning, problems remain. As Butler points out "Most academic units appear to lack the critical mass of staff needed to begin experimenting with a new technology and addressing issues surrounding the incorporation of the technology into teaching."¹⁶ Moreover, as new technologies make the possibilities for teaching delivery ever more varied, rich and complex, they require more effort by the non-expert to master them. Expecting an academic who is an expert in (say) geography, to also be aware of cutting-edge generic research in elearning (let alone a specialist area like online assessment), is as unrealistic as assuming that he or she will be conversant also with recent research into history, mathematics, or any other discipline. As Collis notes "many (outside of faculties of education) may not be aware that there is an extensive base of theory and research related to the science of teaching and learning in higher education and thus can benefit from becoming more aware of certain key principles."¹⁷ Furthermore, despite the growing interest in elearning and borderless education, as McLoughlin and Luca observe: "few

guidelines have been provided by academics on what practices to adopt when designing educative, authentic or valid assessment processes that are suited to distance education and online environments.”¹⁸ The reason for this is that “Assessment is an under-researched issue in online education. At this moment in time there is a serious lack of empirical research on what constitutes good practice.” So, despite the fact that “Online education offers new ways to tie assessment to learning by relating authentic learning tasks and evaluation to the real world. ... Research in this area is limited and embryonic.”¹⁹

eLearning assessment modes - Opportunities and Options

Bodies like the U.K. Quality Assurance Agency for Higher Education accept that proven and reliable assessment modes used for on-campus students may nevertheless be inappropriate for students studying via elearning, as such students may have little direct contact with academic staff.

²⁰ However, a study of online assessment commissioned by the Australian National Training Authority found that “Both the literature and the interview responses confirm that the principles for quality online assessment are the same regardless of the delivery mode. In other words, validity, reliability, fairness and flexibility are the key measures for quality assessment.”²¹ Incorporating some form of assessment within the e-learning curricula, for either on- campus or distance students, is a significant step for any institution, and requires careful considerations of the costs and benefits. Where elearning is employed to maximise the flexibility of the assessment mode, there are significant generic benefits as follows:

- ❑ greater flexibility for tutors and students with any place and any time assessments;
- ❑ saving in time of tutors and administrative staff through simplified and quicker examination procedures (no need to book examination hall, no invigilation or manual collection of papers needed);
- ❑ reduction in the workload of tutors when feedback is provided automatically, enabling more time for face to face contact with students;
- ❑ monitoring the progress of large student numbers is easier with elearning assessments;
- ❑ rapid feedback of individual and group results via email or posting on bulletin boards;
- ❑ simultaneous feedback for both individuals and groups;
- ❑ elearning activities enable the lecturer to monitor (and mediate) the assessment process as well as its outcomes;
- ❑ more flexible and imaginative assessments possible, with greater relevance for students, by using (say) simulations, audio and video clips;
- ❑ students may be able to use a more varied array of materials (audio clips, pictures) when providing responses to online assessments;
- ❑ individual students can work at their own pace while undertaking assessments;
- ❑ improved access for students who are unable to attend for assessment on-campus by dint of physical disabilities or family commitments.
- ❑ where multiple-choice tests are used for on-line assessment, they can encompass knowledge-based subjects quickly and efficiently;
- ❑ where multiple-choice tests are used for on-line assessment, they can reduce the problem of plagiarism that may occur with written assessments, such as essays or project reports.
- ❑ different tutors may assess the same piece of written work with different grades, while multiple choice tests will mark the same responses in the same way every time.
- ❑ discussion groups and bulletin boards can allow students to undertake group assessments and interact to create online learning communities;
- ❑ software, developed either in-house or purchased, can facilitate the design, running and analysis of multiple choice assessments tests, giving students immediate feedback;
- ❑ student data can be captured and analysed by the tutor, enabling diagnostic tests on the student learning experience;
- ❑ submission of students' assignments can be validated quickly and easily;
- ❑ students' work can either remain confidential, or be shared with other students;
- ❑ assignments submitted online can be readily distributed among tutors for marking.

However there are also disadvantages of assessments via e-learning namely:

- ❑ students may need to possess a threshold level of specific technical ability to cope with elearning assessments (e.g. how to use e-mail, how to participate in a discussion group);

- ❑ differing levels of IT skills may advantage computer-literate students who will complete elearning assessments both more quickly and with greater competence.
- ❑ students may be worried about being disadvantaged by problems with the technology during an assessment (e.g. their own computer may crash, or the modem line go down);
- ❑ as students may be able to access elearning assessments at various times during the day and for differing periods, the lecturer may be unable to control the time taken for the assessment;
- ❑ comparing student performance accurately requires that students should be tested under the same conditions, which may not be possible with elearning assessments;
- ❑ students can undertake the assessment wherever, and with whosoever they wish, moreover, unless the system has good authentication, it may not be possible to confirm if the student (or someone else) is doing the assignment;
- ❑ the internet provides a huge resource for students undertaking elearning courses, and plagiarism may be hard to prevent;
- ❑ devising multiple choice questions is time consuming for staff and will require specialist technical knowledge and support staff;
- ❑ multiple choice questions are phrased to permit a finite number of exclusive responses, thereby often reducing the richness and complexity of subject matter, and diluting both the sophistication of possible answers and the demonstration of high level cognitive and evaluative skills;
- ❑ multiple choice questions may promote pure guessing and question spotting by students, and may be unable to discriminate where students may have partial or incomplete knowledge;
- ❑ there is a danger that elearning assessments may be both driven and constrained by the technology available, with technical abilities and limitations becoming more important considerations than valid assessment of the learning outcomes of the course;
- ❑ university computer systems may not be robust enough to cope with extra large increases in usage during elearning assessments, which may therefore need to be phased in operation.

Although a course may be delivered and moderated via e-learning, it need not be assessed online, as students' progress can be monitored through tests or assignments that are posted or faxed to the student and returned the same way, as occurs with most conventional distance learning. Similarly, like their campus-based counterparts, elearning students could be asked to attend supervised examinations at the end of the course. However, although these conventional methods are often utilised as part elearning, their use ignores the fact that where "a subject that is delivered or supported via the Internet, then the possible role of the Internet in the assessment process should be considered at every step."²² Moreover, in practice these conventional assessment modes significantly reduce the flexibility that elearning permits, given that, as Williams argues "the flexible delivery of a course is contingent on the existence of mechanisms that permit flexible assessment. Assessment systems that are believed to be flexible are, in many cases, not terribly flexible at all."²³ Hence having weighed up the generic costs and benefits and made the decision to move to e-learning, it is necessary to assess the available options and choose the most appropriate assessment mode (in terms of validity, reliability, fairness and flexibility) in respect of, inter alia:

- ❑ the learning needs of the students within their particular subject domains
- ❑ the location of the students – on-campus, off-campus, or both;
- ❑ the learning objectives and expected outcomes of the course;
- ❑ the IT skills of students taking the assessment;
- ❑ the IT skills of staff supervising the assessment;
- ❑ the institution's IT infra structure and capacity.

To aid this process, table 1 lists the more commonly used methods of e-learning assessment methods, with their individual advantages and disadvantages.

Table 1 e-Learning Assessment Modes, Advantages and Disadvantages:

Instrument	Advantages	Disadvantages	Use and Application
Online discussion	Require thoughtful conceptualization and presentation of ideas; encourage some who are intimidated by face-to-face discussion; instructor monitoring of discussions catches problems early	Generate huge amounts of text to be evaluated, may require new types of assessment criteria, present time and access constraints. May inhibit less-confident students from contributing	Include discussion or participation online through chat rooms, forums and threaded discussion. Facilitators can monitor contributions by learners as a component of the class assessment. Set tasks for individuals or teams to complete. Get feedback and review from other class members. If the training organisation doesn't have a learning management system, consider using a shareware product and create your own learning community or start a closed community listserv Set each learner a discrete area of work to review and explore. Get learners to review, assess and critique the work, adding complexity and depth to the original piece of work. Add controversial statements to a threaded discussion and encourage learner contributions, with the incentive of credit for participation counting towards the overall assessment
Bulletin boards	Accessibility – lecturers more accessible to campus and distance students; Flexibility – no need for scheduling, group can discuss at any time, enables student to work at own speed and pace; Participation - gender and age equity in discussions as all put forward ideas without interruptions, students less inhibited in online discussions and can take their time to make a considered response; Reflection – group discussion encourages sharing of ideas and promotes deeper understanding, putting ideas into the public domain promotes critical scrutiny, records of threaded discussions enables elaboration and reformulation of ideas to aid to reflection or as revision material; Collaboration – interaction encourages active learning, acts as a catalyst for further sharing and generating new ideas, develops community ethos through trust, enabling peer support and feedback	Technical threshold – needs reliable technology and minimum machine/software specification; Requires initial training – students need to learn how to participate in bb discussions, and create co-operative learning groups, staff need to learn how to guide, stimulate (and constrain) debate to promote learning; Isolation – wait times for responses limits spontaneity especially with students/staff in different time zones, text messages lack the speed, complexity, and richness of face to face dialogue, and may prove difficult for those with a different first language, anonymity may inspire abusive comments; Assessment – quantitative assessment is possible but it may be difficult to assess the quality of discussion and personal input. Outcomes - for Bulletin Boards to provide a meaningful learning experience, staff need to ensure that the quality of discourse rises about opinion and comments, ascertaining individual contributions may be difficult as staff are less able to monitor interaction than in a face to face situation.	Place topics on bulletin boards as the starting point for online collaborative assignments. Post learner work, with prior consent, on bulletin boards for peer assessment, review and comment. Shareware products are available
Collaborative assignments	Enables deeper learning experiences to emerge from group work and discussions. Is a better approximation to how students will use knowledge within their working lives Can utilise case-study material from different national/cultural settings Develops collaborative skills much prized in the workplace Peer group pressures lead to enhanced participation Sophisticated grading systems possible – students can apportion marks to group members.	More effort needed by staff to set up More effort needed to assess group processes and interactions Group tensions over varying inputs and free rider problem Distance students are often highly motivated and used to autonomous working and may resent group assignments Collaboration may be difficult where students work in different nations, time zones, and languages	Set authentic tasks that teams have to investigate and solve. Learners must use online resources to work collaboratively, share resources and findings Appreciation of trans-national/cross cultural insights.. Develop learner communication and team-building skills that are so valued by employers. Contributes to the internationalization of the curriculum. Can use a shareware learning community or listserv.

Online Learning Networks: Assessment And Credit Mobility

	Fewer assignments to mark		
Self-assessment	Teach a lifelong skill; important in distance learning because of potential remoteness, isolation, and few opportunities for interaction and monitoring; online instruments are easily scored and analyzed, providing instant feedback; learners can retry and reevaluate; self assessment aids the reflective process that encourages students to become autonomous independent learners.	Must account for diverse backgrounds and approaches to study; self -assessment that provides only model answers or solutions is not useful	Give instant online feedback through questionnaires, multiple-choice questions and even through publication of FAQs. Allow learners to gather the information they need to focus their study in areas that need improvement Emphasis on formative rather than summative aspects is a limitation when grading students' work.
Online exams	Standard and well-known assessment procedure, producing results and grades readily assimilated within university structures. If students live locally, staff can require them to take live exams on campus at previously agreed times and thereby control the time taken, and authenticate those taking the exam.	Autonomous and motivated on-line learners well acquainted with richer modes of online assessment may resent such passive and unimaginative assessment procedures. Possible problems with student authentication and plagiarism. With large batches of students taking exams at different times, one cohort may advantage another by passing on information about the test, so it may be necessary to use pre-seen papers. Long examinations may lead to eye strain from prolonged exposure to computer screens.	Moderate and control online exams with start and stop times, or with login passwords and timeouts
Online quizzes	Can be used as a diagnostic tool to assess the level of student knowledge prior to the course. Instant online feedback is given to learners through questionnaires and multiple-choice questions	Where quizzes require familiarity with a particular program, there is a danger that IT competence rather than subject knowledge is being measured. Students unfamiliar with bespoke software for quizzes may find the experience both unrewarding and stressful.	Use regular quizzes online for a small component of final assessment. Quizzes can be used as formative assessment during the course, ensuring sufficient skills and knowledge have been attained before attempting a final assessment. Fun quizzes can be used as an introduction to the online assessment environment
Computer-marked assignments	Exams available online can be accessed anywhere at any time. The question set can be randomized to reduce the possibility of sharing answers. Exams can be scored automatically with savings in staff time. Students and staff can get immediate feedback with computer marked assessments. Grading is consistent, transparent and objective. When computer marked assignments can be used repeatedly, as progress monitoring tools, they encourage self evaluation by the student.	Unless they are very sophisticated, computer-marked assignments will be able to test knowledge of facts but not student understanding or learning or self expression. Guessing of correct answers is possible. Technical problems are possible – the university computer may go down, the modems or IT connections of distance students may fail. There may be problems of student authentication and students may report technical problems of they find the examination to be difficult.	Set multiple-choice tests as a quick and easy indicator to learner and facilitator alike of the learner 's progress. Multiple-choice exams, although able to assess mainly knowledge, can cover a broad range of topics. They are easy to administer to large groups of learners and can be made accessible at a time and place convenient to the learner. Further developments are examining the use of automated marking for essays and reports.
Portfolios	Accommodate multiple intelligences; present a cross-section of achievements and skills; capture performance data; require critical self-assessment. By keeping track of early efforts, learners and teachers can monitor progress in knowledge, skills, ability or other outcomes.	Can emphasize presentation over content, require time to compile and assess; creators and assessors need technical skills; storage space and transportability may be barriers	Portfolios are developed using a variety of online tools or computer software products. Learning management systems often have portfolio facilities where learners can gather a range of materials appropriate to the course. Facilitators have easy access to learner products and performances, and, if desired, other learners can also access class portfolios to provide feedback and reviews.
Role play	Role play offers the learners a degree of anonymity, allowing them to express themselves more openly than they might otherwise do. Highly student centred, enables research and exploration of real life events, in which students can speak and act in character allowing more freedom of expression, and thus become active participants in the learning process. Encourages empathy and reflection by requiring students to defend someone else's viewpoint. If used in vocational training, encourages application of subject knowledge and skills and sensitivity to needs of client groups. Develops	Creating and preparing accurate scenarios may be difficult and time-consuming, and they may oversimplify a complex human situation. Students need to have base line knowledge and be well-briefed as to role. Being a group exercise, students' performances are interdependent, failure by one to keep in character may undermine the overall scenario. Stressful for staff who must intervene to ensure that the role play runs smoothly, and without real animosity between participants.	Develop a role play to allow learners to get into the character of the people they are researching. Learners can take on a role which they can research, develop and act out. Of particular value in training situations.

	confidence in verbal communication, enhances team skills and collaboration,		
Simulations	Require learners to construct knowledge and use metacognitive strategies; allow performance-based assessment	Can involve complex programming and specific hardware and software	Run a simulation where there is an aspect of safety involved. Students learning to fly large jets, learning to implement large networked accounting systems, or learning to repair and service lifts and escalators might all benefit from a simulation. However, they are expensive tools to design and develop
Email	E-mail provides direct and interactive communication with students, either generally to all students, or to selected students. A record can be kept of mailings	Using e-mail can be very time consuming as staff are communicating with individual students. E-mail conversations may be delayed and last several days, with messages going to and fro between staff and students. Some email systems do not automatically save outward messages. Students need to be able to identify themselves to staff to avoid confusion. The email system may not be technically robust.	Use email for receiving and tracking reports, assignments and essays. Return work by email with annotations or, with learner permission, results can be placed on bulletin boards for further discussion or peer review. This is simple and easy to use but make sure all learners have an email account, can use the email tools and have access to a computer.
Web publication	In addition to placing print-based texts online and allowing a 'high gloss' presentation medium, this facility could incorporate producing a journal of student work, a relatively easy facilitation of peer evaluation, an editorial section and links to other student journals within or outside of the School. Can be incorporated into collaborative project work.	As with web page production generally, care is needed to ensure compliance with copyright regulations, and, if preferred, access limited through password protection.	Encourage learners to write and publish articles and assignments in web-based publications allowing for peer and faculty review. Get help and set up a class web-based journal so that student work can be published and reviewed online. Develop an online FAQ page where commonly asked emails or interesting emails can be addressed publicly
Web design and development	Vast array of presentation methods and tricks available and the opportunity for creative expression. Allows learners to self and peer assess web design work on the actual web. Publishing their product gives learners a chance to take an observer's critical look at their work. The completed product can form part of the learner's portfolio of work for future employers to view	Low student skill levels and a possibly inappropriate focus on 'look' over content	In information technology courses, learners can complete tasks that contribute to the design and development of their own website.
Peer review	Peer review provides additional and different feedback to that of staff, and from a broader (but less expert) base. When used as formative assessment, peer review can improve the final performance. Moving some of the assessment load to students releases staff time for more productive engagement with students. Being assessors of others' work encourages students to be more aware of the assessment criteria and thereby more self critical and reflective of their own work, and also instills a more collaborative ethos within the student cohort.	Anonymity is essential for peer review to operate properly, but may be difficult to ensure. Running peer review systems takes time, especially if the group size is large, as work has to be circulated and reviews collated. Students may find peer review threatening, and tend to be kind to their peers or for fear of reciprocation if they are too critical. Peer review will not be affective if it does not count towards final grades. Without staff guidance, students may concentrate on grammatical and spelling errors, as these are easily seen, rather than on content and organization. Less weight usually attaches to peer reviews by comparison with staff assessment and this can be a disincentive.	Allow learners to review each other's work. Anonymity may lead to more honest reviews. Encourage learners to share their work to build upon the collective skills and knowledge of the group

Sources: Booth, R, Clayton, B, Hartcher, R, Hungar, S, Hyde, P & Wilson, P (2003), *The development of quality online assessment in vocational education and training Vol. 1*, (NCVER Adelaide) tables 5 and 14,
 Kerka S., Wonacott, M., Grossman, C., and Wagner, J., (2000) *Assessing Learners Online: Practitioner File*, ERIC Clearinghouse on Adult, Career, and Vocational Education, p6
 Additional information by the author

Work undertaken by the U.K. Open University, an e-learning pioneer, and at the forefront of online assessment techniques, has shown that the problems with online assessment tend to be minimal, even with a large student cohort. Although technical barriers did require greater flexibility in assessment procedures and while a “small number of cases of direct copying from external sites were detected ... Often this was a failure to properly acknowledge third-party material, and not a deliberate attempt to cheat.” More pertinently, perhaps, the study demonstrated that “the use of such assessment involves the academics in rethinking their assumptions about the format assessment should take. If such assessment is adopted then it needs to have a strong justification. If it is merely an electronic equivalent of traditional assessment then additional issues involved may outweigh any benefits.”²⁴ The use of on-line assessment in a “conventional” (rather than distance teaching) university produced similarly positive results, finding that computer-aided assessment can lead to significant, if not dramatic, reductions in the time taken to both test and generate test results for student groups across a wide range of subject areas, but indicated that such an innovation requires a substantial management commitment both in policy and resources for it to succeed.²⁵

Benchmarking Best Practice in e-Learning Assessment Techniques

The rise of e-learning and web based education has led to a growth in the use of online assessment, which will increase as the use of e-learning becomes more widespread. Proprietary educational software providers like WebCT (www.webct.com) and Blackboard (www.blackboard.com) offer advice on assessment, while the emergence of companies providing bespoke assessment software (e.g. www.questionmark.com, www.questiontools.com) signals a further fragmentation of e-learning. Useful guidance on online assessment within an academic context is available from various sources,²⁶ however, any university considering the use of online assessment should not consider such an approach as an incremental activity, but attempt to provide an academic rationale for its use, and demonstrate how it supports, and is supported by, course, departmental and institutional e-learning strategies within the University’s overall Mission, which thereby enriches the student learning experience. As the Australian National Training Authority cogently argues: “Assessment plays an important part in the learning process ... it is essential to the accreditation process and results are used ... to measure outcomes and success of the student, teacher, course, or institute. Self-assessment encourages student independence, and helps students develop the necessary skills for autonomous (and lifelong) learning. ... Assessment, especially when embedded within an ‘authentic’ learning tasks or exercises, can also be an essential part of the learning experience. When designing learning programs, the assessment criteria and assessment constraints are usually key determinants of the teaching and learning strategies chosen. If teachers are to engage in new forms of teaching and take advantage of the greatly enhanced teaching options now possible through online and mixed-mode teaching then it stands to reason that we need to unpack assessment options and issues if online teaching and learning is to be maximised.”²⁷ Hence utilising online assessment methods for e-learning “links the pedagogy and methods of teaching with the IT and administrative systems which underpin and institution. ... There is a need to focus on organizational and strategic benefits that such systems offer if properly implemented.”²⁸

Consequently, before institutions undertake the use of e-learning, they need to address many other higher order strategic concerns in order for it to succeed. All too often, however, “educational materials from face-to-face or distance environments are translated into online courses without any supporting pedagogical transformation.”²⁹ As demonstrated, many and varied forms of online assessment are possible. However, as Hayes notes, they should be “‘pedagogically appropriate’ ... (as) ... ignoring this element can limit the learning opportunities online. ... ‘pedagogically appropriate’ assessment online involves learning outcomes being taken as the driving force behind the decisions whether and how to make best use of the available technology ... also ... an awareness of what is practical and/or feasible in the students’ individual learning environments.”³⁰ Building on the concept of what is ‘pedagogically appropriate,’ Rowlands suggests the use of a set of interrogation benchmarks for evaluating e-learning assessment methods as follows³¹:

- Are assessments authentic, based on real life applications?

- ❑ Are assessment items flexible, and are multiple forms of assessment possible?
- ❑ Are students allowed to present evidence of knowledge and skill that is meaningful to them and unique to their learning preferences?
- ❑ Is the assessment introduced before or simultaneously with content material?
- ❑ Is assessment continuous?
- ❑ Is self-assessment or peer assessment available?

These benchmarks have much in common with those within the national e-learning guidelines developed by the Canadian Association for Community Education³² which focus on assessment that is:

- ❑ authentic, i.e., accurate representation of the contexts encountered in the field of study or in real-life tests faced by learners
- ❑ against stated learning outcomes
- ❑ frequent and timely
- ❑ appropriate and responsive to the needs of the learners
- ❑ in various forms such as written and oral assignments, self-assessment, demonstrations, portfolio assessment, and exams
- ❑ competency-based
- ❑ valid and reliable
- ❑ conducted by trained assessors

Although these are useful, Kendle and Northcote³³ argue in favour of a broader approach combining the best of quantitative and qualitative assessment approaches and focusing on:

- ❑ **Variety:** include both quantitative and qualitative methods of assessment. This enables a variety of learning styles to be catered for. Ensure, however, that quantitative methods are those which encourage more than surface learning, through collaboration, feedback methods, problem-based learning, etc.
- ❑ **Authenticity:** design well-defined, open-ended tasks where appropriate – especially those which simulate the tasks students will face after graduation. However, some authentic tasks may also be quantitative in nature.
- ❑ **Collaboration:** allow for interaction between students and others, including fellow students, students outside the course, tutors, lecturers, members of the local or global community and outside experts. The communications technologies of the online environment make this a much simpler and fairer process than in the past.
- ❑ **Feedback:** ensure mechanisms for appropriate feedback are included throughout the online assessment process. Peer feedback and peer tutoring may help satisfy this need.
- ❑ **Make use of online resources:** this may include quantitative packages produced by other institutions; as well as ensuring students make full and appropriate use of the multitude of other resources the internet offers.
- ❑ **Student responsibility:** can be encouraged by ensuring that students are provided with options of pathways within courses and assessment tasks. Provision for such accountability of the learning process can enable large classes of diverse students to be dealt with by using similar assessment tasks with inbuilt options to account for individual student interests, thus influencing motivational outcomes.

The approach taken by the Institute For Higher Education Policy for the National Education Association in the USA is slightly different, and focuses more on the process (rather than delivery) of e-learning by identifying the following benchmarks for evaluation and assessment:³⁴

- ❑ The program's educational effectiveness is measured using several methods.
- ❑ An evaluation process is used to improve the teaching/learning process.
- ❑ Specific standards are in place to compare and improve learning outcomes.
- ❑ Data on enrollment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness.
- ❑ Intended learning outcomes are regularly reviewed to ensure clarity, utility, and appropriateness.

However, benchmarks identified under other headings (course development, teaching and learning process, etc.) in the IHEP study are relevant to online assessment and include:

- ❑ Assessment instruments are used to ascertain the specific learning styles of students, which then determine the type of course delivery.
- ❑ Student interaction with faculty is facilitated through a variety of ways.
- ❑ Student interaction with other students is facilitated through a variety of ways.
- ❑ Feedback to student assignments and questions is provided in a timely manner.
- ❑ Each module/segment requires students to engage themselves in analysis, synthesis, and evaluation as part of their course assignments.
- ❑ Class voice-mail and/or e-mail systems are provided to encourage students to work with each other and their instructor(s).
- ❑ Courses are designed to require students to work in groups utilizing problem-solving activities in order to develop topic understanding.

More usefully, a comprehensive research study undertaken by the Australian Flexible Learning Framework for the National Vocational Education and Training System, identifies key points for the design and implementation of quality assessment in e-learning within four distinct stages. These points are shown in Table 2

Table 2 Key Points in the Design of Quality Assessment for e-Learning.

The Planning Stage	Plan upfront how candidates will demonstrate their competence Use the skills and knowledge you have developed for face-to-face delivery and assessment to help guide your choice of assessment tools and strategies.
Developing Strategies	Consider the skills and knowledge that are to be assessed and determine the best methods to collect the evidence. The technology available should not determine the methods used..
	Make assessment part of the online learning process. The learning strategies and assessment strategies should be developed simultaneously.
	Use a range of methods to collect evidence of competence as with any competency-based assessment, whether delivered online or face to face.
	Ensure assessment is valid and authentic by using strategies such as simulation, problem-based approaches, portfolios of evidence and integrating online and face-to-face assessment.
	Consider how the assessment can be learner-centred by using strategies like self and peer assessment.
	Use the online formative assessment strategies to develop key competencies such as communication, collaboration and team work
Implementation	Clearly state the criteria for assessment upfront to learners. For example, if quality and quantity of online communications count towards final assessment, be clear about the criteria used for assessing.
	Make sure the expectations regarding the timeliness and extent of feedback from the assessor are clear to the learners from the outset.
	Help eliminate cheating by devising ways to know your learners' abilities and by gathering a range of evidence of competence.
	Believe that simple technology can be as effective as complex technology.
	Make sure you understand the capabilities and access to technology available to your client group. Offer other options if online is going to restrict your learners' access.
	Explore the possibilities of blended delivery and assessment methods. Online assessment strategies can be incorporated into a face-to-face class and conversely, online classes can be assessed using real or simulated workplaces.
Assessor Support and Review	Share resources with people in similar fields to help enrich your own materials. Build on your skills and knowledge and keep up to date with the constantly changing technology.
	Use the online environment to review, compare and evaluate your assessment strategies, evidence collected and judgements with other assessors to validate assessment.
	In the online environment, the tools for assessing online and the methods to deliver assessment are often intertwined. The following table is supplementary to the key points and combines both tools and methods in the following grid. It can be used to help guide facilitators plan and develop online, integrated assessment strategies using some simple and other more complex online methods and tools.

Sources: Booth, R, Clayton, B, Hartcher, R, Hungar, S, Hyde, P & Wilson, P (2003), *The development of quality online assessment in vocational education and training Vol. 1*, (NCVER Adelaide) p. 83f.

Clearly, in devising and assessment strategies for e-learning, academic staff will need to pay attention to the assessment regulations and requirements of both their university and national validating bodies. Choices over assessment modes will be constrained, moreover, by the extent to which the university uses information technology in teaching, and the sophistication and capacity of its I.T. network and infrastructure. Finally, the skills base of the staff may need to be raised in order to familiarise them with e-learning and allow them to introduce new assessment techniques

which will enable maximum resource efficiency, but with maximum improvements in the learning experiences of students. However, this analysis should enable the implementation of these features, as part the development of a broader e-learning university strategy. The speed of the development in online technologies and techniques is such that the information given here will not provide all the answers, it should, nevertheless, enable some of the correct questions to be posed.

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