Overview

Integrate digital devices into your assessment plan only if adding them improves the quality of the student learning experience. Improving assessment management should be only a secondary consideration.

Bringing technology to assessment processes can:

- allow students to submit assignments online
- enhance students’ assessment-as-learning experiences
- give students more ways to learn and to demonstrate their learning
- help staff reconsider learning and teaching approaches
- help staff assess in innovative ways
- help staff give timely and more comprehensive feedback, and
- make it easier to manage large volumes of marking and administration.

Often if you improve assessment management using technologies, you also benefit students educationally. For example, setting online multiple-choice quizzes with automated marking and feedback can reduce staff marking loads and give students immediate feedback on their learning performance.

Plan carefully, and manage assessment-by-technology to ensure that it enhances learning. Check also that it doesn’t disadvantage students, especially students with a disability. Be strategic about the integration, so that staff workloads remain sustainable and the university continues to comply with statutory and legislative frameworks.

Video Series - Assessing with Technologies

Dr Carol Russell discusses some strategies, benefits and challenges for assessing with technologies, and Tam Nguyen (Faculty of the Built Environment) talks about using online portfolio tools.

When to use

The main reason to use computers for assessment should be to enhance student learning.

Technology integration is a whole-of-curriculum matter. It can support all aspects of assessment: you can present content and tasks, assess students individually and in groups, provide feedback, and share and manage information about assessment.

You can use it for diagnostic assessment, presenting low-stakes tasks that show students and teachers what students are ready for in terms of learning activities.

Formative assessment activities (ungraded assessments that help students manage their learning) can also be presented online.

Graded, summative assessments (contributing to the final course grade) lend themselves to online presentation. Some
tests can be partly or completely computer-marked; others allow students to review each other’s work.

You can also create **integrative** assessment activities on digital devices, so that students can review their work and assess how well they’ve learned, reflect on how closely they’ve met discipline standards and teacher expectations, and analyse their own work in relation to sample good-quality responses to online tasks.

**Benefits**

Digital assessment can help learners engage more productively and flexibly in learning, and can help staff manage assessment more efficiently and effectively. Here are some benefits that teachers have reported:

- Students can **choose when and where they access content** to learn or engage in assessment (e.g. at home, outside normal university operating hours). This flexibility helps them regulate their own learning.
- Online tests themselves can be more flexible, with **new question formats** possible (hot spots, Likert scales, embedded-answer questions and drag-and-drop exercises).
- You can quickly **analyse student or group performance** on specific questions, and determine an assessment's validity.
- Using tools such as discussion forums and wikis, you can record group processes and support your students as they progress through assessment tasks.
- Students can **re-take online quizzes** as often as they like, and gain formative feedback on basic conceptual competence.
- With simulations, virtual worlds, online role plays and online access to subject experts and resources, students can **experience authentic assessment** at no great cost, and appreciate the relevance of their learning. And you can track each student’s contribution to a complex task like an online collaborative role play or scenario.
- **Intelligent tutoring systems** feed individualised feedback to students about their responses to problem-solving tasks. They can also show students how their performance compares with that of experts. This is useful for both formative and summative assessment.
- Students can incorporate **multimedia and interactivity** when presenting their learning for assessment.
- You can rapidly disseminate **learning support and feedback** to all students in online environments.
- You can keep **electronic records**, for efficiency in compiling later marks and for quality assurance purposes. For example, you can record students’ learning processes, their automated assignment receipts, the marks they were awarded and the feedback you gave them.
- Operating in technology-rich assessment environments, students can develop and be assessed on their **generic technology literacy**.
- You can use **automated text-comparison** services such as Turnitin's OriginalityCheck tool to detect plagiarism as well as to help students develop their paraphrasing and citation skills.
- You can have students use blogs, wikis and ePortfolios to conduct self-assessment and peer review activities.

**Challenges**

When deciding whether to assess electronically, and which technologies to choose, plan carefully. Think about:

- **Access and equity**: An advantage for one student can be a disadvantage for another. Provide choices to counter this disadvantage. The UNSW: Accessibility Support website provides guidelines, and this page of accessibility tips is also useful.
- **Staff workload**: For example, developing online quizzes with comprehensive feedback is time consuming, but may be worthwhile for large classes that must master many basic concepts. In addition, it increases the speed and consistency of feedback.
- Online tests and quizzes, while they can provide excellent formative feedback for students, can be problematic if used for **high-stakes summative** purposes, especially if IT system outages and malfunctions occur during timed assessments.
- **Student stress**: Ensure that students know where to find help (including how to download specific software, if necessary) when they are using and troubleshooting assessment technologies.
- Consider **copyright** issues when you are deciding which technologies to use in learning and teaching.

**Strategies**
The eLearning for Staff page lists the UNSW-supported technologies you can use for learning and assessment, depending on what type of learning outcome you seek. The site also suggests related learning and assessment activities.

Here are just a few examples of how you can incorporate learning technologies into assessment designs to engage students.

**Prepare your students for an online assessment**

- **Make sure they have had practice** using the relevant online tool.
- **Trial the task** with at least two people to check that the instructions are clear and comprehensive.
- **Explain why you are using** online assessment.
- **Ensure that the timeframe is realistic** for students to complete the task.
- **Evaluate whether the weighting of the assessment** warrants the time required to successfully complete the online task.
- **Provide support material** such as guidelines, templates and marking criteria to help students manage the task successfully.
- **Provide instructions on what to do if the technology fails.**

Ensure that the process of learning online is appropriately assessed, as well as the outcomes of learning activities.

**Clearly communicate assessment requirements**

- Using a system such as Echo360, or a voice tool in a Moodle course, **record a general lecture about assessment** in which you provide background information about tasks and answer students' frequently asked questions.
- **Create an assessment activity gateway** within your Moodle course where you integrate task requirements, assessment rubrics, related readings (copyright material must be held in the Library e-reserve, but you can link to it), access to other resources and support, and tools to facilitate group work.
- **Provide online worked examples** of an electronic assessment rubric to illustrate performances at different levels of attainment.

**Create a place for students**

- **Use computer-based interactive assessment activities** in campus laboratories and clinics to engage students actively in learning.
- **Set up online discussion forums** and monitor and assess students' contributions to the threads.
- **Provide students with authentic learning challenges** using online simulations, games and virtual worlds.
- **Use web conferencing tools** to involve international experts, leading scholars and stakeholders in discussions.
- **In between face-to-face meetings, use online groups to brainstorm** assessment tasks.
- **Set up wikis to facilitate multiple contributions** to the preparation of an assessment product, and enable assessment of individuals’ contributions.

**Enhance accessibility**

- Save lecture notes, study guides and learning materials **in an accessible format**, so that students with a disability can rapidly convert files.
- **Build in choices** for students both in assessment design and in the technologies you employ to support assessment. This will make it easier to accommodate special needs as they arise.
- **Provide text alternatives for visual content**, to aid students with visual disabilities, slow Internet connections or other technology-limiting factors.
- **Read this page** of accessibility tips.

**Encourage demonstration of higher order thinking and reasoning**

- **Use integrated blogs and wikis** in your online course to facilitate students' reflective contributions as they prepare for assessment tasks.
- **Set up groups in virtual worlds** to enable students to contribute creatively to authentic assessment tasks.
• Design assessment tasks to **require students to produce digital artefacts**—for example, videos or websites.
• **Have students present their work for assessment using ePortfolios** such as Mahara. This can increase the portfolios’ accessibility, so that you can more easily involve peers and external experts in giving feedback.

**Create learning communities around assessments**

• **Set up the groups yours** for group work projects in the online course, to help ensure that group memberships reflect the diversity of the class.
• **Enable your students to communicate** about assessment tasks with students studying the same material in another university, or even in another country. This can foster a more globalised learning perspective.
• **Invite off-shore students to join a synchronous virtual classroom** with local students, where the teacher provides generic feedback on assessment and then students break out into small discussion groups.

**Give students more responsibility for learning**

• Use a Moodle course to **provide a central space** where students learn and are assessed.
• **Provide a bank of computer-based, randomly generated test items** for students to practise on, prior to a summative test.
• Require students to **put their text-based assignment through Turnitin’s OriginalityCheck tool** before they submit it, and to include a report on the extent of text-matching with their assignment submission.

**Provide safe practice in simulated high-risk tasks**

You can provide virtual:

• accident and emergency wards
• expensive equipment, for manipulation practice
• clients, for practice in counselling prior to working with real clients
• world community planning exercises
• high-risk laboratories, where students can practise safety procedures and teachers can assess their competence.

See the [simulations](#) page for more information.

**Provide guidance and feedback to students**

• **Electronic response systems**, such as clickers, can provide immediate feedback on students’ learning in lectures.
• **Use web conferencing software** such as Blackboard Collaborate (either within Moodle or independently of an LMS) to set up a virtual office for one-to-one consultations. This can be more time-efficient than face-to-face meetings.
• **Use email** for private discussion with students.
• **Open up online public discussion of learning challenges** that many students share, so that everyone can benefit from your feedback.
• **Record audio of your assessment feedback** as you mark students’ work. This lends immediacy and invites dialogue with students about assessment.
• **Prepare FAQs about assessment tasks** and put them online. This can save you a lot of time in the long run.

**Manage and streamline assessment processes**

Require students to **submit assignments using Moodle**. These Learning Management Systems allow you to set up cut-off dates, automated receipts and late submission rules.

You can mark, and mark up with feedback, **digital copies of student assignments** using tools such as GradeMark. This makes it easier for course convenors to manage staff marking teams at a distance, monitoring the quality of feedback given by sessional tutors and modelling best practice for new tutors.

Set up a folder to share access with the marking team and make it easier to coordinate the marking and grading
LMS tools and assessment examples

Here are some examples of online assessment activities that can be provided in UNSW Moodle:

<table>
<thead>
<tr>
<th>Assessment activity</th>
<th>LMS tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to a face-to-face class, have students complete a <strong>short computer-marked quiz</strong> so that it is clear what aspects of the topic need to be clarified.</td>
<td>Auto-graded quiz</td>
</tr>
<tr>
<td>Evaluate students' contribution to <strong>discussion</strong> to encourage participation in collaborative work</td>
<td>Graded discussion</td>
</tr>
<tr>
<td>If providing course content online, include some <strong>s-tests</strong> so that students can evaluate their own progress.</td>
<td>Ungraded quizzes</td>
</tr>
<tr>
<td>With a <strong>written assignment</strong>, have the students exchange and comment on each others' drafts before final submission.</td>
<td>Workshop (peer review)</td>
</tr>
<tr>
<td>Support students in acquiring academic writing skills by having them use <strong>text similarity detection software</strong> while they are writing.</td>
<td>Turnitin</td>
</tr>
<tr>
<td>Use online assessment to <strong>manage grading</strong> of written work, and giving feedback</td>
<td>Grademark, Moodle marking guide, assignment rubric</td>
</tr>
<tr>
<td>Use <strong>audio tools</strong> to provide audio feedback on assignments—research shows that this is very time efficient and appreciated by students.</td>
<td>Voice tools</td>
</tr>
</tbody>
</table>

Case studies

[Video Series - Strategies, benefits and challenges for assessing with technologies](#)

In this collection of videos, Dr Carol Russell discusses some strategies, benefits and challenges for assessing with technologies.

Additional information

External resources
Designing online assessment and learning activities

- Group assessment tasks—planning—planning, choosing LMS tools for group work
- Creating lesson plans in Moodle
- Online learning activities—planning, integrating, using LMS tools
- Assessing online participation—integrating activities and assessment, assessing participation, which tools to use

Useful UNSW sites

- UNSW Accessibility Support website, UNSW Guidelines on Website Accessibility
- UNSW copyright guidelines
- UNSW TELT Gateway, Matrix for selecting technologies

External sites

- Centre for the Study of Higher Education:
  - Core principles of effective assessment
  - On-line assessment
- Australian Flexible Learning Framework, Flexible Learning Toolboxes
- Edith Cowan University, Technology Supported Learning Database

Further readings


Joint Information Systems Committee (JISC) (2007). Effective Practice with e-Assessment: An overview of technologies, policies and practice in further and higher education.


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Appendix

Dr Carol Russell

Assessing with Technologies

Some of the teaching issues include things like, I need to run project-based design problem-solving activities in very large classes, several hundred and sometimes larger than that. There is a lot of theory as well, a lot of engineering science that the students have to learn at an individual level, and sometimes there is a little bit of tension between teaching theory and teaching the design problem-solving activities. There is also a need to develop a lot of graduate attributes, communication skills, the ability to do teamwork and to relate that work to real situations.

Students often work on projects in small groups and teams of 4 or 5 and as well as having the output of their design work they are expected to learn, for example, about the design process and to articulate what they learned about the design process, and to comment on each other's work. So that involves peer review of each other's work, it involves commenting on each other's—on the team processes and how they contributed and how their colleagues contributed to the team process, and that's part of an assessed activity in a number of courses, and that starts with first year.

There's increasing use of mobile technologies for things like classroom voting and for peer marking in the classroom, and using things like iPods, iPod Touches for—or even just SMS and web services to give feedback to the teacher from a large class on whether they understand something or not. Sometimes that's done by clickers, but we have actually chosen to use iPods because iPods are multipurpose devices and they can be used for other things and we have been developing applications for other things. Some of them have marking rubrics—we have software for marking rubrics built in and linked to a web service so that people can select an option from a rubric for all the marking criteria and different standards. So again it helps build up understanding of what the criteria are for a particular activity like a presentation, a student presentation to their peers—the peers can give immediate feedback on criteria.

Simulations are widely used in engineering in the discipline, and can be used to give students the experience of real contexts. One example is in mining engineering where the consequences of a mine design decision can have very long-term consequences that students are not going to be able to experience—but the simulation can take them through what might happen. So there's a possibility of giving students something that they couldn't actually get in practice.

The other way that technology can be used is online role plays—that's been used. In a couple of cases where students take on roles and go into an online environment and have a discussion online, in role, and have to negotiate with somebody else, so they learn negotiation skills.

Things like, how do I know if students are understanding things in my lectures? They need to understand these concepts. You can run online quizzes with feedback, then you can monitor the results. There is one project that's developed a whole suite of adaptive tutorials where students get feedback that the teacher has programmed in beforehand, and then they can monitor how the class, as a whole, goes through those tutorials, and gets the pattern of where people are getting stuck, and where there needs to, maybe, be some remedial teaching done, or additional feedback in the tutorials. And maybe that's one area where some of the engineering academics at least have an interest in technology per se, and are comfortable with developing technical fixes to teaching problems, so, some of the things we've developed have been kind of bottom-up, practical, pragmatic solutions.
Strategies for Assessing with Technology

Be clear about what you're trying to do, what kind of learning it is. I find the distinction between being clear about whether it's an individual and—What's the context? Where are the students? Are they in a classroom, are they at home? Or do you have an opportunity to give them something to do at home that will help the problem? Just really start with the problem and what it is you are trying to assess.

There are lots of tools for all sorts of things. There are rubrics to help clarify the teacher marking; you can use some mobile technologies for teacher marking, for peer marking; and if it's a teamwork—"How do I assess teamwork; how do I know that people aren't cheating; how do I know that there aren't freeloaders in a team project?"—then the peer feedback on team contributions will help; it's very specifically for that and to help people learn how to contribute to teams. On situated learning it tends to be again very context-specific, where there may be some reason why people can't go into a real environment, like in mining engineering or in medicine. There are some things that students probably can't be let loose to do on their own, so there needs to be some support, and technologies can help with that, provide them with information, guidance, support or a substitute, or something to practise on that isn't real, that is safe.

You can look around for those tools or ask for advice. We fortunately have, in Engineering, have an Educational Technologist who's helped to set up a lot of those things and likes doing the problem-solving, so if somebody comes and says, "Look, I'm a bit unstuck with this—I'm looking for something that will do X," then quite often he'll be able to help with that. And I think, probably, Learning & Teaching staff would be able to provide a similar function.

Benefits of Assessing with Technologies

Sometimes the technology can be used to help you do repetitive tasks that are time-consuming. I mean, at a very simple level, there is setting out a question-and-answer forum instead of answering individual student emails. That's ... given, and I hope that most people realise that now.

You can put quite a bit of effort into complex quiz design, if it's going to be used again and it is robust enough to be used again. I was talking to somebody the other day who was concerned about students cheating on a quiz, but I think that may not be a very well-designed quiz, because if they can just copy the answers and share them with other students, then there are tools to put people into groups, project groups, so that the academics don't have to do that manually—that can happen automatically online. The students choose their projects and then are allocated to teams; then they have team spaces to work in. There is Web PA software—software we've been using—for them to give each other feedback on their team contributions. We use Calibrated Peer Review for peer marking of design project reports, and again that's a fully online system where the students give feedback to each other. And that has a number of educational values; in particular, the Calibrated Peer Review helps them understand the marking criteria and what they're being required to do, and it is much more effective than them just being told to do it by the teacher. And also it saves the teacher's time!

Some of the online tools—and there are a number of them—for marking things like essays or reports can save a lot of time and help the consistency of the marking, and they can help you articulate the criteria to the students as well.

You can embody a lot of routine work in the technologies, and it maybe just takes a little bit of time to work out, "I'm spending a huge amount of time doing this, and it's routine—is there a tool that will do it for me?" That's a good place to start in terms of time-saving.

Challenges of Assessing with Technologies

The other important thing is the amount of time it takes to prepare things, and it is worth putting a lot of effort in for something that is going to benefit a large number of students over a long period. But you are not going to want to do a lot of work preparing a simulation or an activity for a few students for one semester that is never going to be used again. So there is a cost-benefit analysis to be done on that aspect of it, and most of the applications that have been developed in engineering have been for large classes, and where they are quite difficult problems that are ongoing like high failure rates or things that can't be done any other way.

The other challenge, which occurs in all disciplines, is, of course, academics' staff time is limited, so they're not going to opt for solutions that take a huge amount of their time or need them to develop skills that they're not really interested in developing.