ePosts

ENHANCING TERTIARY LEARNING AND TEACHING THROUGH TECHNOLOGY

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Ako AOTEAROA™

TOI-OHOMAI Institute of Technology

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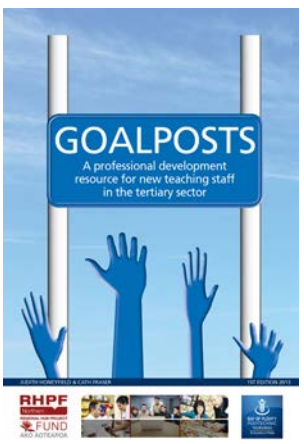
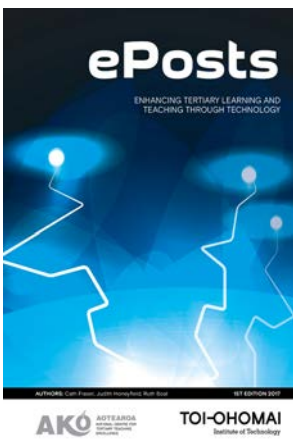
INTRODUCTION

ePosts is designed as a resource for tertiary teachers, particularly those new to their career or those new to eLearning, and for the staff developers who train and support them.

The purpose of ePosts is to:

- Complement two previous resources, *Signposts* and *Goalposts*, on the practice and theory of teaching and learning in higher education. Click the images below to access these resources.
- Use the same style of 10 one-page 'primers', so that readers can identify the areas of most interest to them and have a starting point from which to investigate further.
- Provide an introduction to a broad scope of current ideas about learning technology adoption, written in simple, accessible language. To this end, specific concepts, terminology and principles are italicised in the text, with an accompanying explanation in the Glossary.
- Offer both printable and electronic publication options, where the latter included interactive links to multimedia resources, examples and web pages.





If learning technology is the answer, what was the question?

Some of the typically reported benefits to students, staff and stakeholders from eLearning include:

1. Meeting learner needs and expectations with self-paced, just-in-time knowledge, and anytime, anywhere learning.
2. Enhancing the quality of the student learning experience with interactive and collaborative learning.
3. Improving access and flexibility of study for students, while providing uniform training to a geographically dispersed student base.
4. Delivering teaching services more efficiently with reduced infrastructure costs.
5. Increasing enrolments by targeting new groups of potential students and growing a culture of effective and efficient lifelong learning – on demand.

Change, change, change!

While *ePosts* offers a summary of some of the most recent and influential ideas about learning technology adoption at the time of writing, we live in a world characterised by rapid advances in concepts, skills and technology. Readers are encouraged to maintain currency with developments by engaging with communities of practice, conferences, training opportunities and educational journals – both online and in person.

1. TERMS, DEFINITIONS AND TRENDS

eLearning is defined as any form of learning accessible by web technology, via computer or electronic device. eLearning can be considered along a continuum from enhancing face-to-face learning, to fully online learning, where learners and teachers only ever meet electronically. The method of delivery and the most appropriate blend is determined by student profile and the learning objectives for each programme/course.

Flexible learning

Flexible learning is a student-centred approach covering a range of pedagogies, delivery modes and strategies such as classroom-based, blended or online, aiming to offer the widest possible range of options to meet student needs or preferences.

Technology enhanced learning (TEL)

TEL is learning that is extended through the use of digital technologies, to add value and increase engagement compared to traditional learning methods. Specific technologies include *Cloud* computing, mobile technology, software and *Apps*, social media channels (such as class pages, *Chat rooms* and group lists) and the use of *Learning Analytics* (student-specific data) to customise curricula and resources. Communication channels also harness technology and may include institutional channels as well as *Social Media*, eg Facebook.

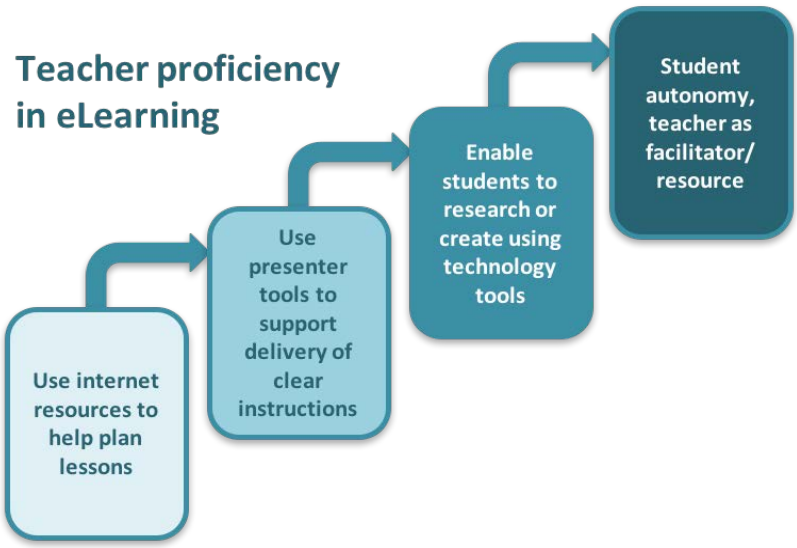


Image from public Wiki: http://slamdunknecc09.pbworks.com/

Blended learning

Blended learning uses more than one learning or teaching mode, inside or outside the classroom, comprising a considered blend of online, technology enhanced and classroom-based learning activities and assessment tasks. The intent of a blended learning approach is to carefully match the learning design to the desired learning outcomes. It can also be a blend of self-paced and collaborative learning, customised content and off-the-shelf content, and workplace and classroom learning.

Online learning

Online learning encompasses flexible, TEL and blended delivery. It also includes fully online learning, developed to provide education for those unable to attend a physical learning environment due to work, personal commitments, geographical or other restrictions. Students interact with the learning content, teacher and other students via the learning management system (*LMS*), utilising features such as *virtual classrooms*, discussion *forums*, electronic assessment, feedback and many other engagement tools to create and sustain strong learning communities.

Future focused pedagogy

Future focused pedagogy is a conceptual approach common to all the above variations of delivery, with an emphasis on embedding literacies, capabilities and skills alongside discipline knowledge. Examples might include sustainability, citizenship, enterprise, and globalisation, as well as leadership, team-work, problem-solving, communication and digital confidence. As students develop these abilities, the balance of a well-designed programme shifts from didactic instruction to independent inquiry and self-regulated learning (Andrade, 2015).

Focus question:
Who are your students and what type of learning technology will best support their learning?

2. NEW PEDAGOGY

Pedagogy determines how teachers plan, develop, deliver and evaluate curricular-based learning. Two key points are: (1) The essential purpose of meeting the course aim and Learning Outcomes is no different for eLearning than other delivery modes; and (2) The choice of eLearning tools should enhance, not determine, the *pedagogy*.

Computational thinking

A characteristic of 21st century life is the increasing automation of work and skills in many occupations, arising from advances in new information technologies and internet connectivity. Graduates need to develop computational thinking – a methodological process of describing and solving problems, and designing, building and evaluating systems that address these. This type of thinking uses technology to create, not just consume, and incorporates systems approaches, *learning analytics*, 'big data' analysis, logic models, and an open-ended inquiry mind-set, all enabled by *Web 3*.0 technology.

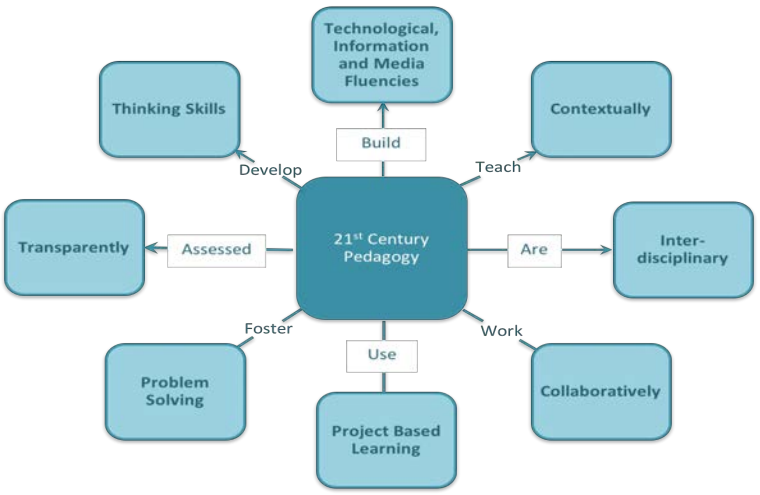


Image from testeach - lessons for free: https://www.tes.com/en-nz/

Information and digital literacies

An earlier focus on computer literacy - using word-processing, spreadsheet and presentation programmes, now includes the ability to locate, critically evaluate and utilise information from a range of digital sources. See NMC Horizon Project Strategic Brief Vol. 3.3 http://cdn.nmc.org/media/2016-nmc-horizon-strategic-brief-digital-literacy.pdf

Maker culture

Using technology for active creation includes areas such as 3D printing, electronics and robotics. Boundaries between vocational, trade-based education and disciplines such as health care and engineering are now more flexible. *Technology transfer* sees rapid movement of new knowledge across sectors, enabled by the file-sharing capacity of the Internet. The growing adoption of open-access, 'creative commons' publication (also known as the Open Education Resources (*OER*) movement) supports the globalisation of pedagogical resources.

Innovation and entrepreneurship

Globalisation, awareness of the finite nature of natural resources and environmental/sustainability factors are driving a knowledge economy, which demands future-focused solutions. Technology is a major enabler of innovative approaches to growth and progress, and educational design must ensure these values and skill sets are integral to learning and teaching to equip students as global citizens.

Student-centred and active learning pedagogy

Modern theory calls for a move to student-centred, active learning, where students develop both thinking strategies and domain knowledge (see *Goalposts* for an extended discussion). Typical strategies include work-based, co-curricular and experiential learning, group work, project based, and problem-solving activities. Learner autonomy can be grown in stages, as shown in Sponken-Smith et al.'s (2008) 'nested hierarchy' model:.

- First-stage entry level may be 'structured inquiry' where teachers provide an issue or problem and an outline for addressing it, often referred to as case-based learning (CBL).
- Second stage - 'guided inquiry' – problem-based learning (PBL) poses questions but allows learners to select how they will explore these.
- A third stage -'inquiry-based learning' (IBL) promotes independent research where topic and solutions are open, and new products and knowledge generated.

Focus question:
Why is it important to make students' thinking 'visible'? What does this mean and what strategies might be effective in raising awareness of the metacognitive elements of teaching and learning?

3. PLANNING CONSIDERATIONS

The team approach to planning

An important starting point is the recognition that where conventional classroom teaching is a one-person activity, eLearning requires a network of services in addition to planning, delivering, advising, assessing and administering student learning. Online learning requires the development of interactive eTeaching resources, management of an *LMS*, and technical support, with resources supplied by multiple teams beyond the subject teacher.

Teachers need to think about:

- New methods of interaction with students
- Strategies to encourage student performance and participation
- Any pedagogical skills and technical knowledge gaps they may need to fill to meet course outcomes
- How they will manage workload, time intensiveness and large class sizes
- Quality and rigour

Institutes need to consider:

- Programme accreditation
- Scalability
- Resourcing and expertise to enact developments (Andrade, 2015).

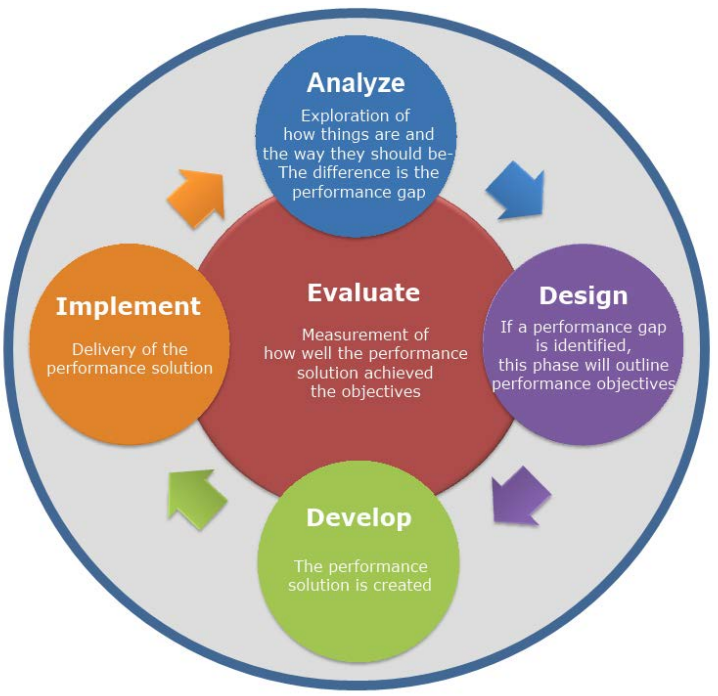
Define learning outcomes first, technology second

eLearning technologies, while offering a range of learning and communication tools, must be dictated by the programme and learners; indeed, eLearning may not suit every training option. Difficulties can arise when responsibility for eLearning strategies and decision-making about programme adoption and management is too separated from those who will deliver it (Higgins & Prebble, 2008). Another difficulty is when the use of educational technologies is left to the discretion of the individual teacher alone. The most effective implementation requires a strong commitment from the institute leadership team, and a shared vision supported by resourcing and professional development for steady uptake.

The top uses of technology by educators: Enabling personalised and individualised learning. (Image: Interface, 2016, p. 12. Reproduced with permission).

An instructional design model

Planning is the key to both addressing barriers and maximising user benefit. One approach is the 'ADDIE' model below, widely used as a systematic, continuous approach to developing, and re-developing educational programmes.



The 'ADDIE' model. (Image: ComLab. Reproduced with permission).

Focus question:
What roles should be involved in each phase of an ADDIE exercise? Are these specialist fields, or part of a teacher's business as usual?

4. DEVELOPING SOCIAL PRESENCE AND CONNECTEDNESS

Social learning theories (eg Vygotsky (Neff, 2015)) argue that learning occurs in, and cannot be separated from, a social context. Enabling students to collaborate and interact with their peers, both face to face and online, provides opportunities for greater self-learning (*heutagogy*), and remains a core challenge for eLearning.

The first few weeks

The first few weeks of the transition from school to higher education are a 'make or break' period for students (Stanley et al., 2011). First impressions count and students must be welcomed into the *virtual classroom* in a positive experience which encourages easy integration, participation and success. Communication and activities need to foster student-student, student-resources and teacher-student relationships. Early sessions also need to demonstrate that students are appreciated as individuals - a unique product of biology, environment, learning and cognitive styles, personality, culture and beliefs, world-views, experiences and memories, and relationships. Understanding the background of students and the experiences they bring to the classroom will assist the online teacher to identify and develop *personalisation* within programme delivery.

Synchronous and asynchronous activities

Early online courses were modelled on distance learning with course material made available to learners to then access at their own time, place and pace: *asynchronous* learning. For many eLearning students, this is still a preferred option as it does not affect their daily commitments. There are many advantages: learning is self-paced, uses technology which is likely already in place, and enables flexible enrolments throughout the teaching period. Delivery mediums include email, *blogs* and *vlogs*, online readings and closed group *forums*. *Synchronous* learning i.e. virtual live classrooms and audio tools that make it possible to do almost everything we do in campus classrooms including seeing and talking to peers, is gaining popularity with improved technology and Internet bandwidth capabilities (CommLab, 2017).

Collaborating through technology

Group activities, such as real-time interactive brainstorming and discussion can be recorded, archived and available for later review and revision. Continuous and immediate correction is possible. An additional advantage is that *synchronous* activities support teamwork and cooperative learning - an important graduate attribute in most disciplines. Delivery uses mediums such as *virtual classrooms*, audio and *video conferencing*, *chat*, *webinars*, application sharing and instant messaging.

Teachers need to:

- Show their presence (and interest!) frequently, through communication tools such as announcements, discussion board postings, and *forums* and feedback.
- Set clear expectations - as to when they will and won't be available, with regular times to meet in a *virtual classroom* or reply to emails or texts.
- Model good probing and follow- up questions (e.g. Why do you think that? What is your reasoning? Is there an alternative strategy?) to encourage sustained communication with timely feedback for optimal learning.

One model for designing a balanced course advocates three types of engagement, all of which are viewed as being equally important (Boettcher, 2013):

- Teacher to student, e.g. weekly coaching and reminder announcements; critical questions for response or to guide analysis.
- Student to student, e.g. online discussions, peer review.
- Student to resource, e.g. mini-lectures in text, video or audio *podcasts*.

Correspondence protocol

Establishing acceptable communication behaviour is important when body language and cues can't be seen. As well as *smartphone*-styled emoticons, tone and emotion can be conveyed through text and punctuation.

Focus question:
What types of *synchronous* and *asynchronous* elements could you use in your course?

5. MANAGING TEACHER/STUDENT ROLES AND EXPECTATIONS

Current perspectives view learning as co-constructed, facilitated to enable students to build on prior knowledge, with activities designed to increase autonomy and agency, resulting in greater ownership for their own learning (Core Trends, 2015), resulting in the need for less didactic instruction (Andrade, 2015).

Keep surprises to a minimum

Expectations about teacher/student roles, tasks and responsibilities need to be clearly stated, with an indication of time commitment for each aspect e.g. in-class time, online participation, tools, electronic assessment submission, Turnitin, etc.

IT skills are key skills

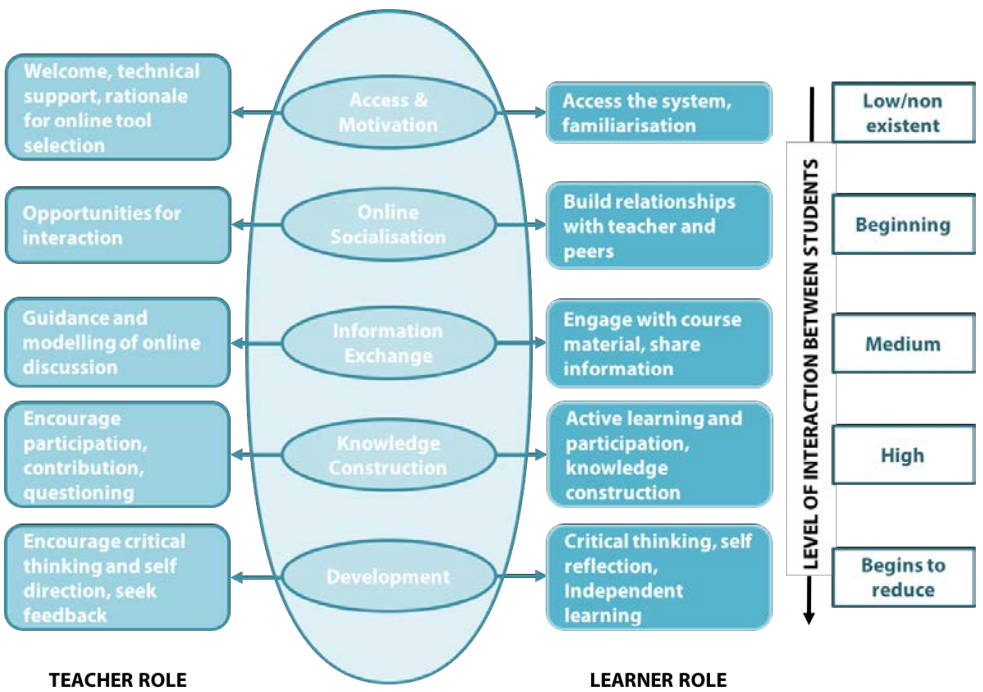
Many students are inadequately prepared for using learning technologies and critical to successful implementation is knowing your students' skill levels and experience. It is essential that a robust technology induction and integrated, ongoing support mechanisms are in place to support the development of these key skills. It is easy for students to respond negatively if their initial experiences with technology are not positive and trouble free (JISC, 2006). By developing these skills students will recognise the value of the *Internet of things* and how to apply technology use in any given situation.

Independent/self-directed learning

Self-directed learning, where students take the initiative and responsibility for what occurs, is an important element in developing intellectual independence and supporting lifelong learning - two desirable graduate attributes. Teachers facilitate increasing independent learning a stage at a time through a hierarchy of skills such as: initiative, formulation of own learning aims, identification of preferred learning strategies and self-evaluation of progress (Hofer, 2005).

Scaffolding

One mechanism for developing skills is scaffolding - supporting students to achieve more than they would have without assistance. Teachers gradually reduce the level of support, shifting more responsibility for the learning process to the student. Salmon's (2013) model below illustrates how to motivate online students, increase skill and comfort in networking - and what the teacher needs to do at each stage to help them achieve success. The interactivity bar on the right shows suggested start and end points with individual and small groups, broadening in the centre stages/activities, with the pace of movement dependent on prior knowledge, software familiarity, student aptitude, etc.



A five-phased model for online interaction (adapted from Salmon, 2013, P. 16)

Focus question:
How can the use of technology best promote self-management, discovery and independence for learners?

6. TEACHING STRATEGIES TO ENGAGE STUDENTS

Group or individual?

Whether online or face-to-face, learning can be more effective and enjoyable when students brainstorm and work through concepts and assignments with others. Teamwork skills are high on the list of desirable graduate attributes listed by employers (Scott, 2015). Yet group dynamics can be complex, and group formation and process need to be facilitated (see Clark & Baker, 2016 for a range of strategies). However, intellectual independence is another prized attribute, and some students work and learn best on their own. Therefore, an effective eLearning class community will include a variety of activities and experiences, including individual, pair and group work.

Inquiry-based learning (see also ePosts #2)

IBL, problem solving and student research projects are ideal for eLearning courses, where networked teams can share information, make decisions together, delegate tasks and review one another's work on file sharing platforms. Activities like this support opportunities for distributed leadership and democratic learning where members can contribute and value complementary expertise. Such approaches are seen as a much more authentic representation of how learning happens in life (Core Education, 2015).

Flipped classroom

This practice reverses the face-to-face classwork/homework elements of course design, using technology to provide online learning resources such as readings, *podcasts*, videos and resources produced using *web authoring* tools. Students view these prior to the in-class session which is devoted to practical exercises, projects, or discussions to embed learning (Berrett, 2012).

BYOD

'Bring Your Own Device' refers to students accessing their *Smartphones*, *Android* devices, tablets, laptops etc in class to increase engagement, participation and student-teacher interaction. Students can use these for research, fact checking, networking, notetaking and visually recording classroom activities and slide shows. However, studies report the potential for distraction and inappropriate uses - one study found: 81% of students reported using email; 68% instant messaging; 43% browsed the Internet; 25% played games (Gaudreau et al., 2013), impacting negatively on academic grades. Thus clear activities and self-monitoring processes are needed to support on-task behaviour.

Student response systems

There are a wide range of student response systems available, which enable students to respond anonymously to a range of question types displayed by the teacher. Students select their answers via mobile device or laptop, with results displayed in real time for the whole class to see (http://www.freetech4teachers.com/2014/03/seven-good-student-response-systems.html#.WcnbkJMjG9Y). This data gives immediate feedback about what is being learned, polls student opinions and preferences, and and can increase student participation (Martyn, 2007; TEP, 2017).

Screencasting

Multimedia *Screencasts* are excellent for creating instructional videos and can be edited to include additional video clips, photos, music, and animations, frequently used in eLearning for demonstrating a step-by-step process, or technical demonstration. Students access via *LMS* to review and learn material at their own pace, or catch up on missed sessions. There are many screencasting solutions such as Soapbox, a free Google Chrome extension. Ruffini (2012) suggests using PowerPoint slides as a starting point for teacher-created *Screencasts*.

Gamification

Applying game-based elements to learning is another way teachers can draw on concepts students may be familiar with, to motivate learners and make the experience more engaging, interesting and enjoyable (CommLab India, 2016). Gamification strategies include: badges; points; levels; leader boards and progress indicators e.g. infrographics.

Focus question:
What activities do your students like to do in class? How do you know?

7. TEACHING RESOURCES

eLearning technologies provide access to countless video tutorials, animations, *simulations* and more, freely available via the Internet. Many software providers offer free trial periods, or multi-user licences and special rates for students. There are also millions of *apps*, free or very low cost, offering great resources/tools. Effective eLearning design encourages students to make the best use of Internet resources such as:

- eText and reference material
- online databases and journals
- legislation, government sites, census data
- non-scholarly material including *blogs*, reviews, organisational websites and discussion lists

Teachers can also enlist students to identify and critique the quality of online content.

Learner generated content

Today's learners are likely to be highly capable of creating/using content on social media - including *blogs* and videos made by other Internet users. Learner Generated Content (LGC) leverages this familiarity to increase engagement and foster informal learning (Parker, 2016). One concern raised is a teacher's potential lack of control over the content; however, Parker suggests two applications in which this may be less of an issue:

- An internal *wiki* that anyone in the class can edit to encourage crowd-sourced information. A teacher might start by adding pages and then let students contribute information and links to interesting content.
- A class *newsfeed* to share content and trends from around nhe web as well as comments. Exemplars and templates for assignments can also be shared as links.

Online video resources

Often produced by experts covering a vast range of topics, e.g. TED Talks; YouTube; TeacherTube; Khan Academy; eTV; and Vimeo, videos support a range of educational uses, e.g. class discussion prompts, or quick review. Students can critique the content, compare with theory, prepare summaries, create quizzes for peers, or research speakers, all examples of active learning.

Online learning resource databanks and teaching programmes

Many educational institutes have online repositories of eLearning resources, based on material from conferences, *webinars*, or *MOOCs*. Some are free, some require subscription/membership. Three representative, well established and reputable examples are:

- ISTE (The International Society for Technology in Education), an international, non-profit organisation which has established standards for the technology skills and attitudes expected of students. https://www.iste.org/standards/for-students
- Lynda.com offers video courses in software, creative, and business skills, taught by industry experts, and widely used by educators for professional development. https://www.lynda.com/
- Kahn Academy is a non-profit educational organisation which produces short lectures in the form of YouTube videos as well as supplementary practice exercises and tools for educators. https://www.khanacademy.org/

Online activity generators

These tools, found with a simple search, are great for teachers making their own resources. Students can also be assigned topics to create learning activities, e.g. quizzes, templates, presentations, *blogs* and *vlogs*, *ePortfolios*, *podcasts*, etc.

Simulation software

Practice and work-based experience is integral for many vocational and professional qualifications, although it is not always easy to accommodate students in real-world workplaces. Sophisticated virtual reality multimedia packages can fill this gap, allowing users to experience the operational process, test solutions or respond to scenarios and variables in a risk-free environment.

Focus question:
How might you try something new in class where students are tasked with finding and analysing learning resources?

8. LEARNING SPACE DESIGN

Learning spaces, virtual and physical, should be designed to promote learning activities, supporting collaborative as well as formal practice, provide a personalised and inclusive environment, and be flexible to respond to changing needs. A growing area of study is producing strong evidence that the ways in which a space is designed shape the learning that happens in that space (JISC, 2006).

The reality!

How awesome would it be if we as teachers were involved in designing the learning environments for our students? The reality is that we are rarely afforded that privilege and use what we have as creatively as possible. This applies to both physical and virtual learning environments and it's what we do in those spaces that positively impacts the learning experience for our students.

Learner-centred

Effective learning spaces consider students' needs and preferences first, placing emphasis on social space as a central focal point. In a physical environment examples of social spaces could include: common rooms and cafés, with the most important requirements being wifi access and not set apart from more formal learning spaces but fully integrated with formal learning spaces. Ideally, Academic support services would also located close by. The challenge is to somehow replicate the opportunity for some 'sociai' spaces and interaction in an online learning environment, which with current techonology solutions, is very easy to incorporate. See Appendix A for a range of ideas.

It's also important to consider the design of your virtual learning space design, ensuring:

- students have spaces to work collaboratively
- formal and informal learning opportunities
- easy access to academic support services and networks

Net Gen students (Van Note Chism, 2006) are typically described as preferring a learning experience which includes, group work, tutor access and IT integration into all aspects of learning.

Multi-purpose

Groups of learners should be able to move from listening to a speaker (traditional lecture or demonstration) to working in groups (team or project-based activities) to working independently (reading, writing, or accessing print or electronic resources). A new open-space model with interconnected areas combining classroom areas with the studio concept, and other teaming, seminar, and assembly areas, is one solution. Pathways - spaces that normally function as hallways - can be expanded to support continued interaction, impromptu gatherings, and individual places for quiet reflection. Faculty offices immersed in the complex encourage further interaction (Dittoe, 2006). A second solution, say Gee and Miller (2006), is that soft and hard systems may need a rethink. New or renovated spaces must also be 'agile': capable of quick reconfiguration to support a range of activity.

Alternate Floor Plans for the Same Space: lecture, workshop/seminar, studio, collaboration (Gee & Miller, 2006)

Reflecting pedagogy

Curricula promoting autonomous, project oriented, student-driven learning, emphasising entrepreneurship and innovation, must be mirrored by built design. Increasingly campus remodelling embodies the concept that learning, discussion and study happen everywhere. There are no 'privileged' experts or spaces when co-learning and co-construction of knowledge is the main objective, interdisciplinary teaching is promoted, and the formality of student-faculty interactions is reconstructed (Dittoe, 2006). One practical example of this is the move away from fixed ceiling-mounted projectors to wireless environments with more flexible *plug-and-play* capabilities - changing not just how and where learning happens, but teaching too.

Focus question:
What different configurations are possible in your learning space? How often do you introduce some variation to re-energise your students?

9. ASSESSMENT OPTIONS

Assessment options

Assessment fits into two categories: *formative* and *summative*. It should be (a) timely, (b) objective, and (c) relevant to the learner (Core Education, 2015). Modern *pedagogy* places growing emphasis on assessment for learning, as well as assessment of learning (Terrell et al., 2016). All learners require feedback on 'how am I going?' at any time during the learning process. Organisations must ensure a robust, secure, reliable, fair and valid assessment environment - whether online or classroom-based (JISC, 2010). Learning technologies offer interactive assessment and feedback, efficiency and reduced workload, meet the needs of increasingly diverse learners, and provide opportunity to demonstrate new technical and pedagogical skills. Learning management systems (*LMS*) or *Cloud* based solutions offer a wide range of functionality for *formative* and *summative assessment*.

Assessment tool selection requires a series of judgements - a useful diagnostic tool to assist decision-making is the Online-Assessment-Tool Selector (OATS) at http://oats.net.nz/ (Terrell et al., 2016).

Constructive alignment of delivery, learning activities, and learning environment is important in eLearning; i.e. all aspects of the programme - learning outcomes, content, teaching and evaluation – should be deliberately designed to support one another (Biggs, 2003).

Creativity

Enabling students to creatively demonstrate knowledge and understanding of their learning is achieved in a way that is flexible enough to meet diverse learner needs, often referred to as 'alternative assessment'. Incorporating alternative assessment strategies also makes the assessment process engaging and fun. Check out this link for 10 great ideas for alternative assessment: http://www.techinpedagogy.com/archives/990

ePortfolios

Digitised collections of student work showcase learning that can be accessed and shared beyond graduation, found to be especially useful in vocational education and training (e.g. Keys, Fraser & Abbott, 2014).

*ePortfolio*s, also referred to as 'digital portfolios', enable students to demonstrate and develop a range of skills eg problem solving, collaborative learning, creativity and digital literacy, which are all key employment skills. These portfolios can be produced using a range of software solutions, e.g. Mahara, Google Sites. See Appendix A for more Digital Portfolio solutions.

Other effective assessment tools that integrate well with digital portfolios include:

- Video - in its many forms
- *Blog*s and *vlog*s
- *Wiki*s
- Web *apps*
- Quizzes - learner generated

See Appendix A for more information and examples, together with a range software tools.

Summative online tests/examinations

These can be scheduled for set times, set for access on completion of certain tasks (conditional) or on demand by the student.

Turnitin – Technology to improve student writing

Turnitin is probably the best known and most widely used tool which identifies source material and similar text to the submitted assignment http://turnitin.com/. It can be used for both *formative* and *summative* feedback and assessment, enabling students to self-evaluate their prowess with citations and paraphrasing, as well as for a final check of originality by the teacher as part of the grading process.

Focus question:
What new assessment options would suit your teaching context? What impact could these have on learning or student and teacher workload?

10. INCORPORATING FEEDBACK, EVALUATION AND REFLECTION

A key consideration of eLearning is how delivery mechanisms optimise student achievement.

Course surveys

- Need to occur early and throughout the course for continuous modification – the anonymous surveys within an *LMS* are an easy way to do this.
- Asking students what is working well and what might improve their course experience is particularly important in an eLearning environment which cannot rely on the teacher observations and informal before-and-after class discussions of a physical campus (Boettcher, 2013).

The end-of-programme experience

- Provides opportunities for reflection and integration of useful knowledge to inform the next offering.
- Wraps up positive social and cognitive experiences for teachers and students.
- Student presentations, summaries and reports can be turned into celebrations of achievement, and shared with other stakeholders - family and whanau, industry and employer groups, organisational management - for reach and impact.
- Can be face-to-face or online, via video-conferencing, *forums*, websites and email distribution lists.

Learning analytics

Online educational activities offer the opportunity to gather data about learner progress. This includes both large scale analyses for evidence-based decision-making in programme design, and more personalised tracking of individual, at risk students, for early intervention.

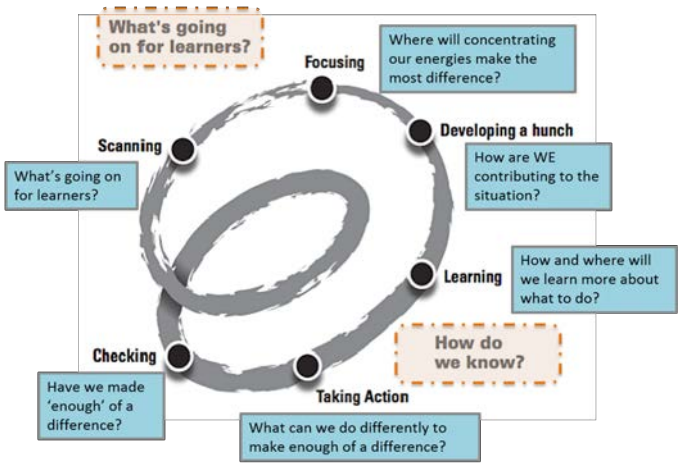
Evaluation models

There are multitudes of evaluation models arranged around inputs (resourcing, curriculum), teaching and learning activities, and outputs (evidence of learning) against the desired outcomes (including graduate skills and employability).

Example 1: The '5 E's' learning cycle

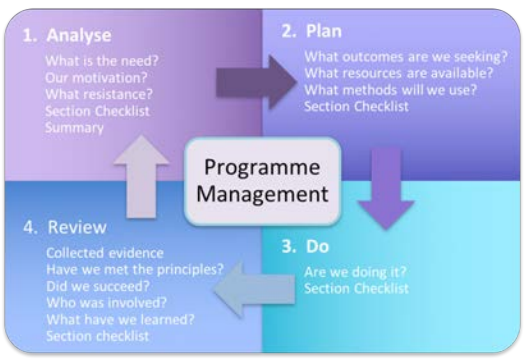
In Roe's (2015) interpretation of the well-known 'learning cycle' concept, inquiry and self-monitoring skills - by both teacher and students - are at the heart of every phase. Emphasis is placed on evaluating the entire process, not just the answer or outcome, ideal for the introduction of new technology-assisted delivery.

Example 2: The spiral of inquiry



This model expands on the more traditional 'cycle of inquiry' as a self-improvement and professional development tool for teachers. (Timperley et al., 2014).

Example 3: The LEAP Framework - project and programme management



The LEAP Framework (Learning, Evaluation and Planning) A four-step model for thinking about change and development – useful in tertiary education for project and programme management (SCDC, n. d. Image reproduced with permission).

Focus question:
What student feedback, evaluation and reflective opportunities would provide the best outcomes for your course?

APPENDIX A: Case studies and examples

The case studies and examples in this Appendix relate to each of the ten primer pages.

1. TERMS, DEFINITIONS AND TRENDS

- Each year CORE Education staff investigate and collate the ways that digital technologies are influencing all aspects of education. The result of this investigation is CORE's list of the ten trends that are expected to make a growing impact on education in New Zealand in the coming year. Here's the link to CORE Ed's 10 Trends from 2007 - 2017: http://www.core-ed.org/research-and-innovation/ten-trends/. If you have time to compare a couple of years, you will see some consistencies year on year, as well as a range of new trends year on year.
- What's next for blended learning? Three universities provide an inside look at how they are evolving their blended learning strategies to drive student engagement and improve learning outcomes Charles Sturt, Monash and University of Sydney.
- Improving student engagement through blended learning. A flipped learning model has been implemented by the University of Melbourne to drive engagement through all stages of the learning cycle
- "Let's use video to reinvent education". In this 2011 TED Talk, Salman Khan, founder of the Khan Academy, talks about the rationale for using technology in education and introduces some of the underpinning concepts: https://www.ted.com/talks/salman_khan_let_s_use_video_to_reinvent_education#t-242979
- The International Society for Technology in Education (ITSE) is a worldwide educator network of collaborators sharing information and resources to empower educators and students: https://www.iste.org/. In particular, check out some of the 'new' Tools to Support Digital Learning
- This EdTech report highlight the six key trends that will shape the coming years for educational technology: https://edtechmagazine.com/higher/article/2016/02/report-6-tech-trends-embody-future-higher-ed

2. NEW PEDAGOGY

- The shift from traditional style teaching pedagogy to the use of new pedagogies enables deep learning to occur. Deep learning focuses on approaches to enhance student retention and retrieval of information and the creation and use of new knowledge in real world contexts through teacher guided learning, facilitated by learning partnerships and collaboration resulting in co-constructed knowledge and application. The use of technology increases the depth and level of success of deep learning through the use of a range of tools which support communication, collaboration and teacher guidance. http://blog.core-ed.org/blog/2015/11/the-power-of-collaboration-in-the-new-pedagogies-for-deep-learning-project.html
- Learning through e-tivities (Salmon, 2013) uses structured online networking to promote student-centred, inquiry-based learning and teaching. Two examples are:
  - "Escapology" (p. 140) – escape route design and human behaviour in emergencies (psychology, sociology, design, built environment, engineering).

    Step 1. Teacher posts videos of successful rescues, news footage, or movie clips.
    Step 2. Students photograph or video signage of escape routes and post to a class wiki with a description of where found.
    Step 3. Students post questions and comments for at least three others' videos and photos. Small group discussion of core similarities, differences, surprises. Groups develop guidelines and post examples of good and poor practice.
    Step 4. Feedback from the teacher.
    Step 5. Revision and 'publication' of final conclusions.
  - "Back to the future" (p. 144) – understanding foresight and trends (education, IT, politics, conflict, business, transport, medicine and health science.)

    Step 1. Students review readings about trends and examples of timelines. Students download timeline software and practise.
    Step 2. Students select one relevant technology from the last 1000 years and create a timeline with at least 10 critical events. Post to the class wiki.
    Step 3. Groups discuss insights and attributes from viewing each other's timelines, select an example and develop as a forecast.
    Step 4. Create a presentation (using Prezi) and upload for sharing, review, critique, and assessment.

3. PLANNING CONSIDERATIONS

- COFA Online (College of Fine Arts) at the University of New South Wales, offers a series of video tutorials for programme designers and teachers (http://online.cofa.unsw.edu.au/). The following suggestions come from

"Planning your online class":
  - » Start with one course, run, analyse, evaluate – then extend to other courses.
  - » Start with blended learning – what are the key activities where having people together online is important?
  - » What tasks which can be completed individually and placed online?
  - » Focus on how students learn: the cognitive development of skill sets and the cumulative development of competence and capability. This might include digital literacy. Build scaffolded pathways into your planning.
  - » Start with the main assessment task, then develop the supplementary tasks, and how to get students involved, discussing and engaging with the topic and with each other to develop ideas.
- "Your main challenge is not going to be the technology, but rather adapting your teaching to a different learning environment" (Bates, 2012, p. 7). Bates' paper What faculty need to know about teaching online: Nine key steps suggests a planning programme for consideration about exploit the unique features of online learning.
- TPACK (Technological Pedagogical and Content Knowledge) is a framework for understanding the three essential fields of teacher knowledge required for technology integration in teaching. See the YouTube video "TPACK in 2 minutes" at https://www.youtube.com/watch?v=FagVSQIZELY

4. DEVELOPING SOCIAL PRESENCE AND CONNECTEDNESS

- Launch the class with a personal introduction posting so that students can get to know you and one another - interests, experiences, circumstances.
- Create a general open student forum for students to post and request help and assistance from each other. Problem-solving and Q and A forums or discussions boards can be assigned to students or student teams to monitor and support.
- Set up small (study) groups where students can assume responsibility for different roles and tasks, and peer mentoring, including encouraging others who are less active online participants.
- "High touch is more important than high-tech". When students are struggling, make a phone call, rather than conducting all communication via the LMS.
- Digital storytelling to share who the others in the virtual classroom are – whether a life story, goals and aspirations, or a critical incident or experience. Options might include web-based stories, interactive stories, hypertexts, film making and narrative computer games, images and music with a narrator's voice recorded over the top etc.
- Class Facebook pages offer a way to discuss coursework, assignments and field trips and to contact peers. Appropriate privacy conventions are important, as with any social media.
- An alternative to Facebook is Edmodo, an international social learning network for sharing content and managing communication. Originally developed for college students, it is now widely used in higher education overseas. www.edmodo.com

5. MANAGING TEACHER/STUDENT ROLES AND EXPECTATIONS

- Check out this list of student and teacher expectations in an online learning environment to help you set expectations and practices: https://teacherrogers.wordpress.com/2017/01/12/list-of-student-and-teacher-expectations-for-online-courses/
- Why we should have high expectations of our students: https://www.youtube.com/watch?v=Ib9DUTL34Pc
- Salmon (2013) shares an example of an e-tivity "Slices of pies" (p. 131) which outlines clearly the roles of both parties. The task is a business management group activity to critically evaluate ideas and impacts for cost saving.
  - » The teacher (1) creates a scenario of a large organisation needing to reduce costs, but not desirous of downsizing the workforce (2) posts a list of pairs who will work together, task guidelines, marking rubric and timeline for different phases of the e-tivity, adding dates and reminders to students' e-diaries (3) manages access/closure of the online tables in which students review one another's work and contribute comments (4) offers set 'chat-box' hours for Q and As and feedback (5) marks and publishes grades by an agreed date (6) summarises and posts key learning points from the whole exercise.
  - » The students (1) research cost reduction initiatives and examples (2) develop and post 5 proposals each (10 per pair), (3) negotiate the pair's top five to take through to the next level and develop three supporting strategies for each, then post (4) review and numerically score other pairs' proposals against a supplied viability/feasibility/creativity rubric (5) participate in a plenary session in a virtual classroom (6) incorporate feedback, finalise and submit their proposals for the organisation.

6. TEACHING STRATEGIES TO ENGAGE STUDENTS

- The glossary activity in your LMS can be used for students to contribute to an evolving list of course-related terms and definitions, and to comment on/critique one another's postings.
- Harness students' interest in the 'Internet of Things' for real-world application of learning to life beyond the programme. Students can conduct inquiries and undertake projects using items with embedded electronics, such as the GPS functions in 'Google Earth' or the biometric monitoring of 'FitBit' watches.
- Animoto is an easy to use web based solution to harness the power of video to 'share what matters'.
- The app Unidoodle is a free classroom response system, allowing students to sketch quick answers and submit via their own devices, which can then be projected and shared, or stored for later viewing.
- Screencasts: Philip Guo's blog offers evidence from several million video watching sessions to show that the optimal video length is 6 minutes or shorter, with advice on how to break up lectures into small, bite-sized pieces: http://blog.edx.org/optimal-video-length-student-engagement

7. TEACHING RESOURCES

- There is a great variety of apps available which are either designed, or easily adapted for tertiary education

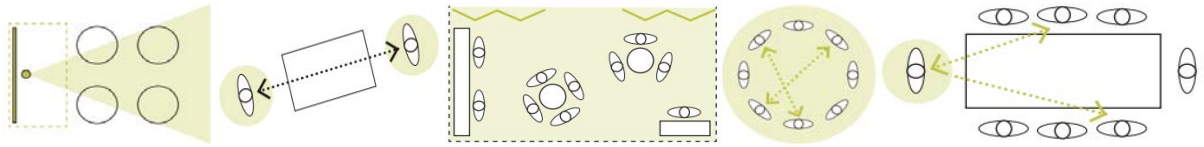
purposes. The following are just some examples (visit the websites by clicking each of the logos below):

  - » Geospike – the Social Travel Journal is a low cost app which captures and stores GPS locations, and can be linked to photos, maps and to collate data. In tertiary education contexts it has been used by students on field trips and conducting field research, to create a visual and geo-tagged record of observations e.g. biodiversity, socio-cultural sites, event attendance
  - » Pocket Anatomy and First Aid are two examples of apps for students who need some level of medical knowledge – generic or specific. Many have interactive features, or can be used to create quizzes for home revision, or class work.
  - » Socrative can be used by teachers to create quick formative assessments with quizzes and polls, which are instantly graded and aggregated for immediate feedback. Step by step sub-questions build confidence and familiarity as a preparation for exams, or the app can be used to manage tutorials and distribute tasks.
  - » Desmos is an online graphing calculator which visually displays students' computational work for a wide range of maths functions. As equations and values are changed, students can see the effect of differentiation.
  - » Other apps suggested by *ePosts* reviewers include: GoSoapBox for class responses; Duolingo for language learning; GooseChase for scavenger hunts; Quizlet for flashcards.
- TED Ed: Lessons worth sharing (https://ed.ted.com/) offers short video lessons aimed at educators and students which can be easily customised and adapted.
- Digital story-telling as an example of Learner-generated resources that can be based on the design sequence: Pre-production – Production – Post-production – Distribution, where each stage has distinct resource and support requirements, and task assignments. See Kearney, (2009) for a planning matrix, also reproduced at http://uq.edu.au/teach/video-teach-learn/docs/lds-table.pdf.
- EDpuzzle (https://edpuzzle.com/) is a fantastic, easy to use resource, free for teachers and students. Turn any video into an interactive lesson, engage your students and access analytics, to check student understanding and more. Save yourself time by using existing videos from Youtube, Khan Academy, Crash Course, or make your own.

8. LEARNING SPACE DESIGN

- How can we adapt traditional learning spaces to enable active and engaged learning and teaching? The following link offers a range of ideas: https://www.hermanmiller.com/research/categories/white-papers/rethinking-the-classroom/
- Vanderbilt University has collected ideas and tips for those thinking about innovative learning environments and how to achieve to maximise the potential for learning and teaching (https://cft.vanderbilt.edu/guides-

sub- pages/learning-spaces/).



- The ways that different kinds of learning activities benefit from different kind of learning spaces (or different configurations of an open plan area with multiple functionality).
  Linking pedagogical activities to spatial settings.

  (Wenmoth, 2009, Slide 7. Reproduced under a Creative Commons Licence, from https://www.slideshare.net/dwenmoth/e-principals2009-presentation).
- In this YouTube video, Dr. Lennie Scott-Webber talks about evidenced-based design methodologies to empower learning: https://www.youtube.com/watch?v=8JQMimJvKIw.

9. ASSESSMENT OPTIONS

- Getting it right: Guidelines for online assessment in New Zealand tertiary contexts is a project by Terrell et al. (2016) which provides a practical resource for teachers to develop varied and appropriate online assessment practices that are valid, reliable and transparent (https://akoaotearoa.ac.nz/download/ng/file/group-4/getting-it-right-guidelines-for-online-assessment.pdf). Twelve case studies describe the applied use of a range of technologies.
- Moodle (https://moodle.org/) is a commonly used LMS, containing a range of features for formative and summative assessment opportunities.
- Cloud solutions: Cloud-based file management and storage systems provide similar functions to an LMS, eg G Suite for Education (https://edu.google.com/intl/en_nz/products/productivity-tools/) (http://www.edudemic.com/best-ways-to-use-google/)
- Turnitin: Most commonly referred to as an anti-plagiarism tool however, it is primarily a teaching and learning tool, enabling students to improve their academic writing in terms of citations, paraphrasing, referencing and bibliography skills.Two other great functions are online marking (via custom sets of comments and rubrics) and peer marking, where students can review each other's work, which can also be incorporated in summative assessment tasks. (http://turnitin.com/)
- Alternative Assessment strategies: http://www.spencerauthor.com/ten-alternative-assessment-strategies/
- PeerWise: An online tool to support the construction, display and organisation of student-contributed assessment questions. (peerwise@cs.auckland.ac.nz) Students develop multiple-choice questions with associated explanations and contribute them to PeerWise. Other students can then answer these for revision purposes, critique and discuss, and rate for difficulty and quality. An example of PeerWise in use at The University of Auckland is available in the training videos at https://peerwise.cs.auckland.ac.nz/docs/
- Creativity tools: Replace essay and report formats with screen plays and script writing to reflect the multimedia environment, encourage creativity and incorporate assessment of digital literacy skills alongside content. Video is a fantastic strategy, enabling students to demonstrate their learning and skills development in many ways: https://www.edutopia.org/blog/5-fast-formative-assessment-tools-vicki-davis
- ePortfolio tools: Google Sites https://sites.google.com/; Mahara https://mahara.org/; WordPress http://wordpress.com/; Weebly https://www.weebly.com/; Wikispaces https://www.wikispaces.com/;
- ePortfolio integration tools, which can be used as additional evidence of learning:
  - » Videos - ranging from curated video eg YouTube and TED Talks. Video is a powerful teaching and learning tool and has great value as a method of assessment
  - » Forums and eLists - Participation in online discussion forums, which are graded on quantity and quality of postings.
  - » Quizzes - provide an instant snapshot of student understanding, with Interactive options providing students with instant results.
  - » Blogs and Vlogs - Blogs (web logs) and vlogs (video logs) allow for a series of entries in text, image or video forms, eg a reflective journal or learning diary, for feedback and assessment.
  - » Wikis - Individually or collaboratively created multimedia wikis can also measure participation and engagement. Terrell et al. (2016) offer a case study of how wikis can be used to measure the interpersonal

skills of teamwork for very large multi-disciplinary classes.

- Web apps: A wide range of web apps are increasingly being used, many of which facilitate a gamification approach to assessment. They can also be used to record practical demonstrations of learning, provide annotated comments and cross reference these to a marking rubric. In class, they can be used to create learning games, exercises or tests, with outcomes recorded and shared.
- Elements of gamification can be harnessed for educational purposes: https://www.knewton.com/infographics/gamification-education/
- The opportunities are limitless. To help you get started here's is a link to the latest gamification trends: https://www.elearninglearning.com/2017/gamification/trends/
- Check out this link to the gamification predictions for 2020: http://www.growthengineering.co.uk/future-of-gamification-gartner/
- Here are a few of the most popular web apps, which can be used in conjunction with alternative assessment strategies:
  - » Feedback tools: Socrative https://www.socrative.com/; Formative https://goformative.com/
  - » Video tools eg iMovie, Windows Movie Maker, Screencasts, Mobile devices.
  - » Quiz tools: Kahoot 'Kahoot' https://kahoot.it/; Soap Box https://wistia.com/soapbox; Quizizz https://quizizz.com/; Quizlet https://quizlet.com/
  - » Integrated presentation and quiz tools: SMART Lab https://classlab.com/; Nearpod https://nearpod.com/
  - » Collaboration tools: G Suite for Education https://edu.google.com/

10. INCORPORATING FEEDBACK, EVALUATION AND REFLECTION

- Use audio-video options when providing significant feedback rather than typed comments, especially where students are underperforming. A more personal presence from the teacher has been found to emphasise the positive, constructive strategies suggested as a way forward to assist students act on feedback.
- COFA Online (College of Fine Arts) at the University of New South Wales, offers a series of video case studies http://online.cofa.unsw.edu.au/. "Using ePortfolios as a reflective teaching tool - Case study" describes post-graduate education students using blogs as reflective journals, and incorporating these in a submitted ePortfolio using a platform called PebblePad. In the first semester, students use these as the basis of a discussion with their personal tutor. Later, they customise a supplied template that can be exported to match the career trajectory. At the same site, from a different programme, there is "An example of an excellent ePortfolio" which could be used as a resource for students.
- Google Forms are a free online tool which can be used to create surveys and quizzes, and can also allow students to provide anonymous feedback about a course. A step-by-step guide is available at https://support.google.com/docs/answer/6281888?co=GENIE.Platform%3DDesktop&hl=en.
- Google docs provide functionality to record teacher feedback via software such as Voice Notes, Kaizena, etc.
- Turnitin has both text and voice feedback options to assist students improve their understanding of feed-forward

APPENDIX B: Glossary

Term	Definition	Page
Android	A mobile operating system developed by Google, primarily for touchscreen mobile devices.	6
Apps	Short for 'Applications'. Computer programmes, commonly downloaded and used on mobile devices.	1, 7, 9
Asynchronous	Electronic communication which is not restricted to a specific time	5
Authoring tools	Used to create eLearning courses - three popular ones are Articulate (360) 'Studio/ Storyline', 'Adobe Captivate', and 'Lectora Inspire'.	6
Big data	Huge sets of electronic data that is available for analysing, e.g. census data.	2
Blog	A regularly updated website or web page, usually run by individuals or groups to share ideas. Blogs can also be used to monitor distance students or those out on work placements.	4, 7, 9
BYOD	Bring Your Own Device (BYOD). Learners bring their own tablet, laptop or *Smartphone* to class with them. Rationale: having access to the device both at home and in class has the potential to create a seamless and ubiquitous learning environment.	6
Chat	An online, (a)*Synchronous* conversation carried out by writing messages e.g. texting.	4
Chat room	Any form of *Synchronous* conferencing, occasionally even A*synchronous* conferencing, to share information via text with a group of other users. Can be open - Chat with strangers, or a closed membership. Chat rooms are often located in a *LMS*, but can also use shared *Cloud*-based files, where class members send, read and reply to messages in chronological order, or as threaded (topic-based) discussions.	1, 9
Cloud	Cloud computing is a type of internet-based computing that provides shared computer processing resources and data to computers and other devices on demand, enabling ubiquitous, on demand access.	
Distribution list, eList, List serve	Electronic mailing list enabling widespread distribution of information.	10
ePortfolio	Digitalised evidence of student achievement can include demonstrations, resources, and records, and may contain documents, databases, slide shows, video and audio files, graphic images and weblinks.	9
Flipped classroom	Content learning (e.g. previewing text, videos, *Podcast*s, etc) is completed at home thereby creating more time in class for discussion and collaboration to cement the learning.	6
Formatve assessment	Formative assessment occurs during the programme, monitors learning, providing ongoing feedback for teacher and student.	9
Forum	An online bulletin board where information can be posted and responses received.	1, 4
Heutagogy	The study of self-determined learning, including knowledge sharing, and emphasises both competencies and capabilities. Knowing how to learn is as important as subject knowledge.	4
Internet of things	The inter-networking of physical and virtual worlds through devices with electronic components – buildings, vehicles, security systems, appliances	A-ii
Learning nalytics	The collection, analysis and reporting of large datasets relating to learners and their contexts. Investigating, identifying, collating and reporting on meaningful patterns in data. Student analytics: including survey results, success and completion data - especially to identify where targeted support is needed and guide responses. Data-driven organisations use analysed data to predict future behaviour, plan interventions and optimise outcomes. Data is often reported through infographics (information graphs) or dashboards (often used to depict the performance of an enterprise, or business units). Both provide visual representation of facts, events or numbers using icons, illustrations and brief text.	1, 2, 10

LMS	Learning management system – a software application for the administration and delivery of e-Learning and blended learning courses. Two widely used examples are Moodle (Modular object-oriented dynamic learning environment), and BlackBoard.	1, 3, 6, 9, 10
mLearning	Mobile learning allows learners to access learning on a mobile device of their choice.	1
MOOC	Massive, open, online course, which is free to enrol and offers a certificate of completion or 'badge' on completion.	1, 7
Net Gen	The classification of 'Net Generation' is applied to people born between 1982-1991 who have grown up in a world where they have experienced constant exposure to technology.	8
Newsfeed	Newsfeed or rich site summary (RSS) integrates latest news from selected websites.	7
OER	The Open Education Resources (OER) movement provides a library of digital resources that support teaching and learning with educators freely sharing resources, Pedagogy and materials for other teachers and students to use and modify at no cost. An example is the Creative Commons licensing of publications as Non-commercial, Share Alike licences.	2
Pedagogy	Higher level thinking, including philosophy, of the theory and practice of teaching.	1, 2, 9
Personalisation	A commitment to delivering teaching and learning that is responsive to students' individual and unique circumstances	4
Plug and play	A Plug and play device is one that automatically discovers a new device, enabling its use without the need for physical device configuration.	8
Podcast	A digital audio file, usually made available online.	4, 5, 6, 7
Screencast	A digital video and audio recording of what occurs on a teacher's computer screen that can be used for tutorials, demonstrations, digital storytelling, and narrated PowerPoint presentations.	6
Simulation	A representation of the real world on a computer. Simulation software is computer software that represents real-world situations and experiences in a computer environment for study, entertainment, projections, increasing efficiency, modelling possible alternatives in advance of a strategic choice, and other reasons.	7
Smartphone, smart device	A smart device is an electronic device that can connect, share and interact with other smart devices	4, 6
Social Media	An online platform that is used by people to build social networks or social relations with other people who share similar interests or activities. In general, content is user-generated. Examples: Facebook, Twitter, LinkedIn, YouTube, Google+, Instagram, Pinterest, Tumblr.	1
Summative assessment	Summative assessment processes occur at the end of a period of learning, evaluates outcomes, records grades and provides feedback.	9
Synchronous	Real time electronic communication or interaction - just like classroom learning except that the instructor and all the learners could each be in an entirely different location. Even though they are separated by distance, they can communicate with each other via Chats, IMs and real-time video.	5
Technology transfer	Also referred to as transfer of technology (TOT), is the process of transferring (disseminating) technology from the places and groups of its origination to wider distribution to more people and places.	2
UDL	Universal design for learning is the idea that instructional goals, methods, materials, and assessments must work for everyone —not a single, one-size-fits-all solution but rather a customised and flexible approach to curricular design.	4
Video conferencing	Electronic facilitation of face to face meetings with people who are geographically distant. Example of VC software: Scopia via KAREN Bridge (Kiwi Advanced Research and Education Network).	4
Virtual classroom	A learning environment which can be accessed by students without the need to physically attend a programme of study.	1, 4

Vlog	A video Blog or video log is a form of Blog using video.	4, 9
Web 3.0	Web 1.0 technology was about information provision; Web 2.0 introduced the two-way web, with interactive facility – Wikis, videos, *SNS* etc for sharing, and internet purchasing. Web 3.0 is about connectivity: access from anywhere, integrated virtual worlds and education, business and entertainment, and the Internet of things.	2
Webinar	An online, real time seminar, which can be attended and viewed worldwide.	4, 7
Wiki	A website or database developed by a community of users, with no restrictions on editing or adding content. Wikis can be continually re-edited, with a record of who has contributed what to the page. Images, videos, links and other forms of multimedia content can be added.	9

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