UNSW Learning and Teaching Forum
Towards 2025: Inspiring Learning

Never Stand Still  PVC (Education) Portfolio
Introduction

The focus of the October 2016 Learning and Teaching Forum, “Towards 2025: Inspiring Students” is the UNSW 2025 Strategy and the Scientia educational experience. The 2016 Forum aims to bring together the university community to explore and engage with the strategic priority of teaching excellence. The 27 UNSW presenters and 37 poster authors at the 2016 Forum shared their practice, experience and wisdom on how they have approached improving the educational experience of students and ‘inspiring learning’ via:

- Assessment and feedback strategies
- Providing opportunities for students to solve grand challenges
- Developing partnerships with stakeholders
- Providing work integration opportunities
- Thoughtful curriculum, course and program design
- Engaging students through digital innovation
- Prioritising equity, diversity and inclusion

This publication brings together the posters presented at the Towards 2025: Inspiring Students, Learning and Teaching Forum, October 2016. Together they provide examples of how individuals and groups at UNSW have inspired students in a diverse range of contexts, to enhance learning and teaching practice.

I commend these to you.

Professor Geoff Crisp
Pro-Vice-Chancellor (Education)
As part of the 2016 Learning and Teaching Forum, staff were invited to develop a poster around the theme **Towards 2025: Inspiring Learning.**

**Foci for posters include:**

- Equity, diversity and inclusion
- Internationalisation
- Curriculum/program design
- Learning environments
- Research integration
- Empowering students
- Assessment and feedback strategies
- Work-integration
- Teaching excellence
- Digital innovation

**Criteria for Poster Presentations**

- The poster should be designed to provoke discussion but only needs to focus on one aspect of your teaching practice
- The poster should be visually appealing
- The poster should ideally include the voices of students (e.g. student feedback)
- The poster should be of appropriate publication quality for inclusion in the booklet, including appropriate referencing
- The size of the poster is A1
- The poster should include the logo of the Forum (to be provided)
- The text should be easily read from a distance of 1.5–2 meters
- The poster can be an electronic or multimedia presentation

Visit the Forum webpage to view further details about the 2016 Learning and Teaching Forum: [www.teaching.unsw.edu.au/forum](http://www.teaching.unsw.edu.au/forum)
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Tutorial-lecture Swapping to Enhance Students’ Learning

Furqan Hussain, Peter Neal, Christoph Arns
School of Petroleum Engineering

Until recently, a key strength of studying with UNSW Petroleum Engineering was the small class sizes. Classes of around 40 students enabled instructors to spend significant time in one-on-one and small group teaching as part of the conventional pattern of a lecture followed by a tutorial. However, the effectiveness of this pattern has decreased over the past five years as student numbers have increased by 300% to 400%. In response to this rapid shift from small to large classes and to facilitate active student learning, we modified the delivery of three courses by using tutorial-lecture swapping. The goal was to achieve sustainable improvement in the delivery of these courses and enhance our students’ learning experience. In this poster we present the methodology and lessons learnt from our experience. One of the main advantages is the embedded feedback loop. This dialogue enables common misconceptions to be efficiently replaced with discipline knowledge.

Methodology

Students discuss question with their peers and identify the problem.
Teaching staff get feedback from multiple groups.
Teaching staff guide students if their problem identification is incorrect.

Students identify possible solutions.
Lecturer summarises main conclusions from the tutorial.
Tutorial conclusions align with basic lecture topics.

Motivation
A rapid increase in the number of students has made existing lecturing style more passive and less effective. To overcome these issues the course delivery was modified using tutorial-lecture swapping: a tutorial question is given before the related topic is discussed in the lecture. In this poster we present the methodology and lessons learnt from our experience.

Increased class size!

40 in 2010
120 in 2016

Students Feedback
Anonymous surveys showed that more than 80% students prefer the new teaching method. Students commented that...

• “having the tutorials before lecture [makes the] theory more meaningful”
• “[this method] works well but [is] sometimes unnecessarily long [or] boring”
• “[this method] promotes learning of the material rather than memorisation”
• “interaction[ion] with students – the best feature of [the] method.”
• “[it’s] very structured… [it] allows me to participate…”

Lessons Learnt
• Redesigning course design encourages active participation and deeper learning by students.
• This teaching approach is highly suited to advanced level courses.
• Careful and targeted tutorial redesign leads to improved student satisfaction.
• After initially heavy workload, teacher satisfaction is improved with tutorial-lecture swapping.

Furqan Hussain, Peter Neal and Christoph Arns
School of Petroleum Engineering, Faculty of Engineering
Online Practical Examinations Using Adaptive Tutorial Technology

Gary Velan, Patrick de Permentier, Mark Hill, Stephanie Dowdell
School of Medical Sciences

Introduction

The UNSW Medicine program employs progressive practical examinations across multiple discipline groupings to drive learning of important practical skills. These examinations function as a barrier to progression for students in Phase 1 (years 1 and 2). The histology, embryology and pathology component of the examination has three iterations annually, employing whole slide images to test both diagnostic skills and feature identification. Ordering and interpretation of diagnostic investigations are also addressed. Marking these examinations previously required 30 hours for cohorts of 280 students. Moreover, provision of specific feedback to students is difficult and time-consuming.

Methods

We utilised the Adaptive eLearning Platform (Smart Sparrow™) to develop timed online practical examinations in histology, embryology and pathology. The exam incorporated: feature identification through drag and drop questions and dropdown lists; multiple response; and multiple choice items. Each examination took 5-10 hours to develop. Students accessed the assessments securely in a computer laboratory. Answers were automatically graded upon submission.

Results

The format was well accepted by students, with minimal technical difficulties. Mean grades were similar to paper-based examination methods. Analytics enabled constructive feedback to students, including heat maps showing common misidentifications. Items exhibiting greatest difficulty were referred to discipline coordinators to inform their teaching.

Conclusions

Online practical examinations are well accepted and efficient, saving approximately 20-25 hours of academics’ time per iteration. They also provide valuable and effective feedback on learning for the benefit of both students and teachers. Take-home message Online practical examinations may be the way of the future for image-based disciplines.
I developed and taught a new course, ZPEM2312 Fundamentals of Data Analysis (FDA), which is undertaken by all UNSW Canberra students, apart from those who have completed Maths 1A or Engineering Maths 1A. This requirement was initiated by our Rector to ensure that all graduates are exposed to key quantitative methods relevant to them in their military careers.

FDA aims to teach students to use data to answer questions and make informed, objective decisions, to evaluate information, to reason logically and evaluate the reasoning of others, to understand the methods of data analysis and to apply appropriate techniques to analyse data. It focuses on understanding the concepts of statistics without overemphasizing the mathematical detail. It introduces a computer software package, Excel, which is used for data exploration, presentation and analysis.

The two-hour weekly labs allow students to practise the techniques covered in lectures. The lab sheets include instructions which lead them through the theory and teach them to apply it to data from real-life scenarios, either “by hand” or using Excel. I identified a need for effective lab assessment that encourages students to stay on task and engage with the material, as well as providing them with immediate feedback. I wanted to avoid assigning attendance or participation marks, or requiring students to submit lab reports.

I adapted the “checkpoint” method of assessment used by my Physics colleagues (Low and Timmers, 2011). At two points on the lab sheet, I include a checkpoint symbol. When students reach a checkpoint, they ask a tutor to look over their work. Their mark for each lab is then the number of checkpoints successfully completed (i.e. 0, 1 or 2). This method of assessment which has been well received by students appears to be effective as almost all are fully engaged throughout the lab sessions.

Reference:
In science journals, commentaries are written to discuss major new findings reported in an article, making connections between the new findings and existing knowledge, and exploring the implications of these findings. In designing a scientific writing assignment for Introductory Pharmacology and Toxicology (PHAR2011), we developed an authentic assessment to mirror the process of a scientist goes through to publish a scientific paper i.e. submit an article for peer review, receive feedback, respond to feedback to produce the published article. In the same manner the commentary assignment is scaffolded with students having the following tasks (i) identify 3-4 key ideas from the scientific article provided and search for extra supporting sources (2-9 articles) that provide information in the context of the field, and submit their notes; (ii) write and submit a commentary article (< 1000 words); (iii) classmates peer review articles and provide feedback anonymously via Moodle; (iv) students revise the articles according to the feedback and write a response which outlines how feedback has been addressed; (v) the final version of the commentary article is submitted for grading. Prior to complete each task, it is practised and reviewed in tutorial classes. This assignment cultivates the students’ abilities in identifying key terms, ideas or concepts, organising the identified information in a commentary format. It develops students’ professional feedback skills, in both providing and responding to feedback. The scaffolded nature of the assignment and the need to respond and act upon feedback and thereby closing the feedback loop which has resulted in improved student writing. Students report that they felt that the whole process was challenging and the activities have promoted them to think critically, and to gain insight into the authentic processes of scholarly review and publication.

Peer Feedback and Scaffolding Student Learning: Developing an Authentic Assessment

Lu Liu, Trudie Binder, Angela Finch
School of Medical Sciences

Learning Objectives:
• To develop critical thinking and scientific writing skills
• To develop skills in providing and responding to feedback

Course: PHAR2011 Introductory Pharmacology and Toxicology (2012-2016), taken by ~ 250 2nd year students from Science, Advanced Science, Medical Science and Medicinal Chemistry programs

Peer Review Process for a Commentary Assignment

A. Scientist studies something
B. Scientist writes about the findings and sends an article to a Journal
C. Journal editor pre-reviews and assigns the article for peer review
D. Peer reviewers read the article and provide feedback
E. If an article finally meets editorial and peer standards, it is published in a Journal

Students identify 3-4 key ideas from a journal article introduced by their tutor, and conduct literature search for further extra supporting sources

Students prepare and submit a commentary style manuscript to Moodle ‘Workshop’

Each manuscript is assigned to two student reviewers randomly via Moodle ‘Workshop’

Students practice providing feedback in tutorial class

Each student reviews two manuscripts and provide constructive feedback anonymously via Moodle ‘Workshop’

The manuscript and peer feedback are returned to students

Students practice responding to feedback in tutorial class

The final version of the commentary assignment is submitted through Turnitin for grading

Students revise the manuscript according to the feedback and write a response outlining how feedback has been addressed

Students reported that they felt that the whole process was challenging and the activities have promoted them to think critically, and to gain insight into the authentic processes of scholarly review and publication. Staff have observed improvements in student’s writing and reviewing skills.
Using Learning Analytics to Close the Feedback Loop:
Personalised Assessment and Blended Feedback in Multilingual Courses

Stephen Doherty, Cath Ellis, Ludmila Stern, Ian Zucker
Faculty of Arts and Social Sciences

Consistency in assessment and feedback is paramount in traditional, blended, and online courses. The multilingual nature of translation courses poses a challenge to this consistency as assessment and feedback must account for the universal features of all languages as well as language-specific issues and ever-changing professional standards.

This project combines learning analytics with measures of self-efficacy to provide insights into how students can best make use of ‘blended feedback’ in translation courses and how their tutors can provide it in an effective and efficient way.

This project aligns with Strategic Priory A2, Educational Excellence, as its approach is to enrich the student experience using enhanced online assessment and feedback to integrate and improve standards-based assessment and the consistency and usefulness of blended feedback.

Focussing here on the student voice and the perspectives of their tutors, the findings from the project have enabled us to measure and improve:

1. the usefulness of all modes of feedback as reported by students across 14 language directions in 2 post-graduate courses;
2. the likelihood that this feedback will be understood and implemented by students;
3. student self-efficacy for using feedback to reach the courses’ learning outcomes;
4. the consistency and efficiency with which our 14 language-specific tutors provide blended feedback.

As part of the project’s deliverables, we have developed and validated a multilingual translation assessment rubric, an aligned QuickMark set, a best practice guide to blended feedback with accompanying online and face-to-face training materials, a reflective toolkit for translation students embedded in their formative assessment, and a template for online courses in our discipline.

We show how these findings are being used in the iterative development of our program, and to develop the School’s first multilingual and multimodal blended learning Capstone course. These initiatives have been supported two UNSW Learning and Teaching Innovation Grants.

I could reflect on my strengths and weaknesses
My tutors really cared about my development
Opened a dialogue on feedback
Gave me confidence to ask my tutor for specific feedback

Stephen Doherty, Cath Ellis, Ludmila Stern & Ian Zucker
Faculty of Arts & Social Sciences
To E-Test Or Not To E-Test?

Suzanne Schibeci¹, Jonathan Kress², Chris Tisdell³

Learning and Teaching, ¹School of Mathematics and Statistics, ²Faculty of Science

As the tertiary classroom shifts more into the digital space, educators are seeking on-line, flexible forms of assessment. While Moodle has the capacity to create quizzes useful for revision or formative assessment, these methods are not conducive to the controlled assessment of course content. The traditional pen-and-paper examination under invigilator control is difficult to replace in the on-line environment. Software which provides the capacity for this assessment integrity, and is supported by UNSW IT, is Maple TA.

Maple TA was designed for on-line testing in Mathematics (Maplesoft, 2015), and is used routinely by UNSW School of Mathematics and Statistics. It can be used for formative quizzes and summative assessments in a controlled, host-defined environment. Its use in language-based disciplines, however, is in its infancy. This trial aims to pave the way for its use in an array of disciplines, and may be of interest to a wide audience in the University.

To gauge its efficacy in written questions, Maple TA was trialed by the Faculty of Science in SCIF1111 in Semester 1 2016. A History and Philosophy of Science component in this course was tested twice during semester, using short answer questions.

From the examiner’s perspective, e-tests are more streamlined than paper/pen tests: time is saved photocopying, distributing and collecting papers and marking is more streamlined. However, student reaction was divided. A survey was given to the students at the end of semester, asking about different aspects of the testing system. While the poster shows results for specific questions, there was slight overall support for the e-tests (52:48 support:disapproval). The main criticism, in both formal and informal feedback, was the noise of the keyboards in the room, which added to students’ stress. They were also apprehensive about their typing ability under examination conditions.

If e-testing is going to compete with paper/pen tests, soft touch keyboards are needed for examination conditions.

Some solutions are:
- Computers with quieter keyboards
- More exposure to e-tests in low stake assessments
- Corralled work-spaces

Advantages for the examiner:
- Time saved photocopying, distributing and collecting papers
- Capacity to randomise questions
- Timing devices unnecessary
- Don’t need to spend time deciphering answers
- Marking questions is quicker
- Giving feedback is simpler

Students were asked 2 types of questions: agree/disagree and preference for computer/pen & paper. The chart keys are:

- Disagree
- Agree
- Equal

Easy to use
Reliable
Reduced cheating
Positive experience
Recommend

Write faster
More tiring for hands
Change, move & correct more

Prefer typing to handwriting
Computer should replace paper

More engaging
More stressed
Better performance

Advantages for the student:
- The only major problem for me was the NOISE...
- Better performance

The sound of everyone typing frantically... was extremely distracting and made me feel more stressed...

Don’t need to spend time deciphering writing

My mark didn’t depend on me reading the question and my handwriting was improved

The chart shows:

- 52% for e-tests
- 48% against e-tests

References:
This poster will address the transformation of a blended format distance education postgraduate program to a fully online innovative program that meets the 2025 strategy for global and digital engagement. The program has been positioned as the peak postgraduate pharmaceutical medicine program in the Asia-Pacific region, providing local perspectives that are not found in EU or US-based degrees. Linkages have been established with international pharmaceutical companies operating in China with the aim of attracting their employees to the program. The program complements many national initiatives such as the clinical trials initiatives and the National Innovation Agenda.

Thorough reviews of both the program and its international competitors, as well as a survey of students, alumni, tutors and industry stakeholders were conducted and the results used to inform changes in program design. In addition, graduates have helped develop learning activities for current students. The redesign is based on student-centred learning using authentic activities to equip students with appropriate industry-relevant skills (digital literacy, communicative, collaboration, critical thinking and problem-solving skills) and flows from both connectivist and constructivist epistemologies (Siemens, 2005; Helfand, 2013; Yuan and Kim, 2013; Jones, 2007; Ashworth, Brennan, Egan, Hamilton & Saenz, 2004; Biggs & Tang, 2011; McCluskey and Winter, 2012). The RASE model (Mirriahi, Alonzo & Fox, 2015) and the UNSW integrated curriculum framework have been applied to each course within the program to support student learning.

The redesign has led to an improvement in student learning and engagement. One example being the activity developed to encourage students to engage in understanding the legal basis underpinning medicines regulation. Students were paired to research and discuss specific questions, then post responses in a discussion forum, with active comments and questions from other students and tutors. This led to high numbers of posts in the forum, high engagement and students expressing their satisfaction with their learning.

References:
PlayTax® is a novel educational application which provides a unique learning platform for both undergraduate and postgraduate UNSW Business School students to explore and interact with sophisticated international business taxation concepts and decisions. Launched in 2016 in the course International Business Taxation (TABL2756/TABL5583), the conceptualisation and modelling underlying PlayTax commenced in 2015. Based on the highly successful educational platform Playeconomics, the three-fold foci of PlayTax are: internationalisation; research integration; and digital innovation.

PlayTax is a gamified platform that simulates how a hypothetical multinational enterprise ('MNE') structures its internal affairs in a tax-minimising manner. To do this, it applies a novel multi-purpose mathematical model developed as part of an ongoing doctoral thesis.

PlayTax provides an applied learning experience for students, who are made responsible for determining international business decisions. These decisions enable students to establish operations across multiple jurisdictions, make capital funding decisions, and determine their product pricing strategy – including the possibility of developing an e-commerce presence. Importantly, international tax rules overlay these business decisions, and act as decision-making parameters. This encourages students to explore various degrees of MNE tax-aggressiveness – and potentially to become the subject of a tax audit. Issues relating to global tax transparency, which have recently been earmarked by the OECD, are highlighted through this unique learning platform.

As such, PlayTax synthesises theory and practice through a technology-enhanced learning platform. In addition to the e-book built into PlayTax, which constitutes the most up-to-date 'textbook' available for this course, it also utilises Moodle forums to further encourage student engagement, which is supplemented by in-class discussion to develop a distinctive, challenging and applied experiential learning framework.

By integrating course content with a problem-solving narrative, PlayTax provides a unique learning platform which encourages playful exploration of sophisticated concepts to boost student engagement and improve academic performance.

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* PlayTax was developed in collaboration with LionsHeart Studios Pty Ltd.
Providing hands-on laboratory experience for undergraduate students is becoming increasingly difficult due to large class sizes, unavailability of equipment, exuberant costs, and stringent health and safety requirements. Virtual laboratories provide students with the opportunity for interactive, one-on-one learning, simulating real-laboratory experiences. Importantly, virtual laboratories are highly flexible in time and place.

Flow cytometry is a core technology, widely used in research and diagnostic laboratories. It is therefore essential that our students have an understanding of this tool. With no suitable flow cytometry simulations available in the education space, a virtual laboratory focused on flow cytometry was developed for undergraduate, honours and postgraduate research students. The simulation was developed using the Smart SparrowTM Adaptive eLearning Platform. The lesson was designed to be adaptable to multiple audiences, with several platform datasets incorporated into the simulation to cover the many scientific fields that use the technology.

The simulation provides students with a personal experience with the interface, very similar to the latest in flow cytometry technology. Students are in control of instrument parameters, most of which are not usually available to them in laboratory classes. It is accessible online, and allows students to repeat lessons in their own time and to their own satisfaction. After being deployed in undergraduate classes, students reported that the lesson improved their understanding, their confidence in their technical skills and was targeted to their level of understanding. The average amount of time students spent in the lesson was 47 minutes with some returning for further revision.

Our flow cytometry virtual laboratory facilitates the learning of technical skills in data collection and analysis. Such skills are important for both undergraduate and postgraduate students who require an understanding of the applicability of this technology in the real-world for future employment and/or research opportunities.

The tutorial is available at: https://www.best.edu.au/lesson/?id=49734.

Evaluation:

The resource helped build confidence in my technical skills:

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Conclusion:

The virtual laboratory facilitates the learning of technical skills in data collection and analysis.
Live streaming adds spontaneity and interactivity to video. This makes it an important part any online communication toolbox, especially suitable for large courses. The UNSW School of Mathematics and Statistics (the School) uses live streaming for class test and final exam revision, and together with our online tutorials this has improved the pass rates of our large first year service course Mathematics 1A by 6%. In addition, the School broadcasts public lectures live as a way to engage the wider community with UNSW research.

The School uses YouTube Live for live streaming, and previous streams can be viewed on our channel https://www.youtube.com/user/MathsStatsUNSW.

Over recent years, live streaming technology has become cheap and user friendly. This poster discusses when to use live streaming or regular video, and invites you to consider how you could use live streaming as a complement to your teaching.

Live Streaming in Mathematics and Beyond

What is live streaming?
Live streaming video is a way of delivering content as it is being created. In contrast, regular video content is edited and produced before being delivered to the viewer.

What content is suitable for live streaming
Since 2015, the School of Mathematics and Statistics has used live streaming on YouTube Live for exam revision across first and second year subjects. The School also live streams seminars and public lectures.

Live streaming is an important part of the suite of tools used by the School to deliver blended learning content.

The advantages of live streaming are the speed of delivery and the opportunity for audience participation. The disadvantages are that there is no visual/audio correction or editing. Consequently, live stream videos have a lower production value and shorter shelf-life compared to edited video.

This makes live streaming the preferred medium for long videos when speed and interaction are more important than production value and longevity.

Do students like it?
Live streamed videos are particularly popular with students. The 2016s1 Mathematics 1A exam revision live stream was watched for 100,000 minutes (4,600 views, 92 Likes and 400 comments), and the smaller class test streams were watched for about 40,000 minutes each.
Maps, for example concept maps, knowledge maps or mind maps, are at their essence, graphical representations of ideas or concepts. Concept maps (originally developed by Joseph D. Novak in 1972) are particularly interesting and potentially effective tools to facilitate integration between disciplines. These maps are visual representations of sequences and relationships designed to illustrate phenomena in any field of study (Novak and Canas, 2008). Use of concept maps has been shown to enhance integration of knowledge, critical thinking and clinical reasoning skills (Torre et al., 2007), while proving acceptable to students with a wide variety of learning styles (Laight, 2006). Moreover, in medical education such concept maps have been shown to enhance meaningful learning (Rendas et al., 2006), a finding that we have also confirmed in medical students (Kumar et al., 2011; Ho et al., 2014). This project employs knowledge maps. In contrast to concept maps, knowledge maps do not require a hierarchy of concepts, opening wider applications for learning and assessment (Hanewald & Ifenthaler, 2014). Knowledge maps have been shown to be an effective method of facilitating deep learning and integration between disciplines. However, there was no satisfactory method that enabled real-time automated assessment and feedback on students' knowledge maps. Utilising UNSW Innovation and Development funds, we modified, enhanced and implemented an existing knowledge mapping tool (Wu et al., 2012). The software tool (https://www.knowledgemaps.unsw.edu.au) has been implemented in Medicine and Medical Science courses, and is available to academics at UNSW. The tool enables automated assessment and feedback on students' knowledge maps. Further, it facilitates scaffolding of knowledge mapping activities, thereby enabling tailoring of tasks to students' prior knowledge and experience. Quantitative and qualitative evaluation of the educational impact of the tool will be presented.

Online Knowledge Maps: A Novel Automated Assessment and Feedback System to Enhance Learning
Gary Velan, Veronica Ho, Richard Vickery, Nalini Pather, Nicodemus Tedla
School of Medical Sciences

Online Knowledge Maps
A novel automated assessment and feedback system to enhance learning – https://knowledgemaps.unsw.edu.au

1. Why knowledge maps?
- Visual representations of knowledge
- Promote meaningful learning
- Enhance integrated understanding

5. Then students said...
"It's a perfect way to link the concepts from the lectures together and is a really efficient way to learn. It's really relevant and really good!!!"

6. Now what?
- Further refinements for ease-of-use
- Develop activity and assessment modes
- Activity mode provides a range of scaffolding and feedback options
- Assessment mode enables formative or summative testing of understanding

Fig 1. Teacher's knowledge map
Fig 2. Scaffolded knowledge map
Fig 3. Feedback on submitted map
Fig 4. Analysis of outcomes
Fig 5. Before After
Perceived Understanding of Students using IHD Knowledge Map

Maps, for example concept maps, knowledge maps or mind maps, are at their essence, graphical representations of ideas or concepts. Concept maps (originally developed by Joseph D. Novak in 1972) are particularly interesting and potentially effective tools to facilitate integration between disciplines. These maps are visual representations of sequences and relationships designed to illustrate phenomena in any field of study (Novak and Canas, 2008). Use of concept maps has been shown to enhance integration of knowledge, critical thinking and clinical reasoning skills (Torre et al., 2007), while proving acceptable to students with a wide variety of learning styles (Laight, 2006). Moreover, in medical education such concept maps have been shown to enhance meaningful learning (Rendas et al., 2006), a finding that we have also confirmed in medical students (Kumar et al., 2011; Ho et al., 2014). This project employs knowledge maps. In contrast to concept maps, knowledge maps do not require a hierarchy of concepts, opening wider applications for learning and assessment (Hanewald & Ifenthaler, 2014). Knowledge maps have been shown to be an effective method of facilitating deep learning and integration between disciplines. However, there was no satisfactory method that enabled real-time automated assessment and feedback on students' knowledge maps. Utilising UNSW Innovation and Development funds, we modified, enhanced and implemented an existing knowledge mapping tool (Wu et al., 2012). The software tool (https://www.knowledgemaps.unsw.edu.au) has been implemented in Medicine and Medical Science courses, and is available to academics at UNSW. The tool enables automated assessment and feedback on students' knowledge maps. Further, it facilitates scaffolding of knowledge mapping activities, thereby enabling tailoring of tasks to students' prior knowledge and experience. Quantitative and qualitative evaluation of the educational impact of the tool will be presented.

Online Knowledge Maps: A Novel Automated Assessment and Feedback System to Enhance Learning
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First year mathematics courses at UNSW aim to equip students with not only computational and problem solving abilities, but also an understanding of underlying principles and the ability to effectively communicate mathematical concepts and ideas. However, assessments have tended to focus on computational skills, where achievement is easier to quantify, to the detriment of deeper understanding and communication skills, which are needed more than ever in the modern technical workplace.

This year, MATH1031 Mathematics for Life Sciences incorporated some tasks aimed at refocusing the assessment and feedback to facilitated the development of mathematical communication skills. The first step was to free staff time spent on routine marking of computational skills so they could concentrate detailed feedback to students on conceptual errors and the structure and presentation of their writing. To this end, previously hand marked class tests were conducted using MapleTA and an e-exam environment developed by the School.

Students' mathematical communication skills were developed and assessed with assignments that were peer assessed using the Moodle workshop tool and tutor graded using the Turnitin's grademark interface. In one assignment, students wrote a short review of a video on how mathematics was used by a non-mathematician in a field of study close to their own interests. The second assignment involved traditional exam style questions. These not only gave students practice with including mathematics in typed documents, but also provided more detailed feedback on their writing and arguments than had previously been possible. The peer assessment of these assignments developed students' abilities to critically analyse their own and other students' work.

Online peer assessment and e-exams provide not only effective and timely feedback to students, but are scalable tools that can be applied to make similar reforms in larger courses. The materials, assessments and insights from the initial implementation will be presented.
Self-Directed Laboratory Learning via Hi-Def Multi-View Video Guidance

Julien Epps, Vidhyasaharan Sethu, Ray Eaton, Eliathamby Ambikairajah
School of Electrical Engineering and Telecommunications

Every year, more than 1200 first-year engineering students learn foundational hands-on skills in the electrical engineering laboratories. Large teams of sessional demonstrator staff are needed to guide laboratory learning, however their live explanations are not persistent, cannot be observed easily by large groups of students, are repetitive, and vary in quality even after training. Electrical circuits are small, challenging to build and highly detailed, and the use of complex lab equipment needs to be mastered in order to learn effectively and gain confidence. To address this problem, a suite of digital recordings of experimental electronics was designed, created and post-produced using five high-definition cameras by a team of staff and high-achieving students, and stringent production values were observed. The recordings were then integrated with the laboratory programs of five medium/large engineering courses, and an evaluation of their use across these courses strongly supports their use. Students viewed the multi-angle recordings often multiple times for lab preparation and/or laboratory exam preparation, empowered with this new means to learn, however their live explanations are not persistent, cannot be observed easily by large groups of students, are repetitive, and vary in quality even after training. Electrical circuits are small, challenging to build and highly detailed, and the use of complex lab equipment needs to be mastered in order to learn effectively and gain confidence. To address this problem, a suite of digital recordings of experimental electronics was designed, created and post-produced using five high-definition cameras by a team of staff and high-achieving students, and stringent production values were observed. The recordings were then integrated with the laboratory programs of five medium/large engineering courses, and an evaluation of their use across these courses strongly supports their use. Students viewed the multi-angle recordings often multiple times for lab preparation and/or laboratory exam preparation, empowered with this new means for self-study. The impact of this project has been 20-60min worth of enhanced learning opportunities for self-study. The digital recordings allowed students to completely reproduce experiment, (iii) address all relevant skills: best practice in circuit construction, conventions, debugging and precise note-taking, (iv) student presenters to engage the student audience.

Motivation

- 1200 first-year students in electronics laboratory each year
- Hundreds of demonstrator-hours per week, instruction quality varies
- Repetitive explanations, difficult for large group to observe

Related Work

Most similar existing lab resource was MIT’s Electronic Circuits course (shorter, lower quality, unclear explanation, no link to analytical or professional skills).

Mayer’s (2008) principles of multimedia instruction: reduce extraneous processing, manage essential processing, foster generative processing

Concept

(i) short, clear, reviewed reference explanations of key concepts, (ii) high-definition simultaneous recordings of multiple views - capture everything, allow students to completely reproduce experiment, (iii) address all relevant skills: best practice in circuit construction, conventions, debugging and precise note-taking, (iv) student presenters to engage the student audience.

Evaluation

Questionnaire across five medium-large Electrical Eng first year courses

Q: “The digital recordings changed what I did in the lab, or how I went about the lab”

Student comments: “allowed me to ask more specific questions. I could easily recognize if I was using anything improperly”, “[changed my questions] because I knew how the equipment was supposed to work”, “Reduced the number of questions I needed to ask”

Impact

- Significantly improved materials, providing 20-60min worth of enhanced laboratory learning per week per student, no extra space requirement
- Novel form of educational resource, internationally leading in EE
- Integration in 3 large courses to date, improved lab learning quality


Julien Epps, Vidhyasaharan Sethu, Ray Eaton, Eliathamby Ambikairajah
Electrical Engineering and Telecommunications, Faculty of Engineering
Online Personalised Adaptive Revision Tool

Hazel Bateman, Kevin Liu
School of Risk and Actuarial Studies

Students taking postgraduate professional business courses have diverse backgrounds. The conventional face-to-face and distance learning delivery format has inherent limitations to 1) address the different learning needs of students who have diverse backgrounds and differences in prior knowledge; and 2) provide timely feedback and direction to facilitate student learning.

To address this problem, we adopted a personalised adaptive learning approach in the course ACTL5401 Retirement Planning (Distance Learning). We developed an adaptive learning/revision tool in the context of a case study assessment where students were asked to develop a comprehensive financial plan for retirement. Students were required to take an online pre-test before gaining access to the case study. The online pre-test took the form of an adaptive revision quiz which provided instant feedback to students. Depending on their understanding of key topics and prior experience, students were then automatically directed to an online personalized revision path based on their demonstrated knowledge gaps. Only when students scored well enough in the pre-test would they be able to proceed to the case study assessment. This approach addresses the limitations of the existing delivery format for both face-to-face and distance learning cohorts by providing instant feedback and automated learning/revision pathways to meet the different learning needs of a diverse student body. Under the adaptive revision approach, students can advance at their own pace as they revise the knowledge necessary to complete the case study, and their revision focus is directed towards their particular needs.

The introduction of the adaptive revision tool led to significant improvement in student satisfaction of ‘feedback’ and ‘teaching method/activity’ and enhanced student performance in the assessment task. CATEI increased from S2 2015 to S1 2016 (particularly for Q2, Q9 and Q10). The average grade for the assessment ‘feedback’ and ‘teaching method/activity’ and enhanced student performance in the assessment task. CATEI

The conventional face-to-face and distance learning delivery format has inherent limitations to:

1) address the different learning needs of students who have diverse backgrounds and differences in prior knowledge, and

2) provide timely feedback and direction to facilitate student learning.

Using the Smart Sparrow Adaptive eLearning Platform, we designed an online personalised adaptive revision tool, which helps students to assess their understanding of the key topics in each learning module, and provides instant feedback and automatic personalized revision paths based on their demonstrated knowledge gaps.

1) Identified required level of understanding of key content and common misconceptions.

2) Developed online revision quizzes for each topic and corresponding automated feedback, adaptive learning/revision pathways, and directions to relevant online learning resources.

3) Demonstrated required knowledge in each quiz before students able to access to the major assignment.

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**The Design**

**The Outcome**

**The Challenge**

**The Solution**
Data suggest that students do not pay attention for more than 10-20 minutes during a lecture. Instead, their attention alternates between being engaged and non-engaged in ever-shortening cycles throughout the lecture segment (Bunce, 2010). Some other sources (Richardson, 2010) suggest a shorter span of 8-10 minutes.

We have taken an active learning approach in large classes to keep students engaged.

During some of our first and second year mathematics classes, we have engaged students in the lectures using online real time polling. Digital tools such as Google Forms or polltogo.com have proven to be simple and effective learning solutions. The questions on the short poll focus on one or two key topics in the lecture. The types of polling questions vary from simple multiple choice questions to solving some simple mathematical questions.

When compared with a traditional classroom response system such as “clickers” (Bruff, Martyn 2007), online polling is more cost effective and is easier to use while achieving additional benefits.

Our evaluation results show that students saw these opportunities as being valuable to their learning (98% agreement of 349 students) and many would like these methods used in future classes (99% agreement of 349 students). We also extracted common themes regarding student feedback, including comments regarding interactivity and engagement (Tisdell, 2016).

References:


Tisdell, C. “Interview questions for collecting good assessment practice”, 2016, interview transcript, Hong Kong University. 

References:

Briggs News http://news.bbc.co.uk/2/hi/uk_news/education/8449397.stm


Tisdell, C. “Interview questions for collecting good assessment practice”, 2016, interview transcript, Hong Kong University.
Useful learning resources are increasingly becoming available online through Massive Open Online Courses (MOOCs) and other sources. Multiple sources may cover the “same” subject matter, but from a variety of perspectives or in a variety of styles, and this provides an opportunity to personalise recommendations to individual students about which resources might best suit their own background, preferences and ambitions. Such personalisation is particularly important for our increasingly internationalised student body, with some students lacking background knowledge that would allow them to take maximum advantage of our courses (creating demand for supplementary learning resources), and many students being multilingual and so being keen to access resources that are presented in a variety of languages. This poster will illustrate and demonstrate a digital innovation, known as the StudyBuddy, that has been developed, in part with the aid of a UNSW Learning and Teaching Innovation Grant, to provide students a gateway to online learning resources that recommends, to individual students, particular resources that are best aligned with their needs and preferences. The StudyBuddy provides students with a web interface through which they can specify their preferences, track their progress through courses, and access personalised recommendations, which are generated from a database of mappings of topics and perspectives provided by online resources. The poster will detail our experiences in offering the StudyBuddy service to postgraduate and undergraduate students in the School of Electrical Engineering and Telecommunications (for courses TELE3118, TELE9751, TELE9752), who have made such comments as “I think the background revision was useful.” We are keen to collaborate further with others from across UNSW to make this resource available for courses in other schools across the university. The StudyBuddy can be accessed at studybuddy.unsw.edu.au.
Despite its collaborative possibilities, online forum postings can quickly become repetitive or perfunctory. This poster shows the implementation of and lessons learned from introducing a method of student-led instruction which reframes the typical forum posting task. The Rapid Quiz Method places students in the role of teacher, and thus increases participation and engagement. The goals are for students to improve critical thinking skills, to create a focus for content and to assess peer responses. To achieve these goals, eighteen students in a ten week University Entry English Course took on a series of content interrogation and assessment tasks. In this approach, pairs of students created and posted to Moodle a set of questions based on three discrete sections of an allocated short film. They then answered another set of questions created by other student partners. Since tasks are interdependent, students must work cooperatively within and across teams, and time limits introduce an element of competitive urgency. Follow-up activities include producing a summary of the critical aspects relating to a theme. Results of implementing this method were variable, but encouraging overall. Experimenting with different group sizes and longer film sequences showed that larger groups were more chaotic and less likely to complete tasks. The inadequacy of very small mobile devices, such as smart phones, was also highlighted. The activity worked better in class time, rather than asynchronously. Since the task was conducted in real time, student contributions and authenticity were readily verified. This immediately highlighted whether key issues were identified and categorised. Instances of problematic lexical and grammatical issues, such as topic comprehension and question formation, presented opportunities for immediate feedback. This approach could also be used as a flipped classroom activity across a range of disciplines. It would certainly help students to develop confidence and skills in undertaking preparatory tasks for leading seminar discussions. Finally, the completed series of Q & A postings provides an accessible, useful review site, created for and by the participants.
To increase student engagement and ensure proper retention of teaching material, a pilot was developed incorporating a flipped classroom model within the CEIC3004 Process Equipment Design course. An interactive online module entitled “Algal related taste and odor in water: source, identification and separation challenges” was developed using an eLearning authoring tool and incorporated into Moodle (presented at UNSW 2015 Learning and Teaching Forum). This module provided an introduction to the topic followed by a short quiz imbedded with feedback which tested students’ prior knowledge. This model was piloted in the same course in 2014 and 2015. In 2014, the online module was introduced to the 127 students and a reminder email was sent out to complete the task before the class. In 2015, an in class polling activity was also introduced to the 129 students alongside the pre-class online module. Also, in addition to the reminder emails, an extra 10 minutes was allocated prior to the start of the lecture to complete the activity. In 2014, 43% of students completed the module; while in 2015, 77% attempted which is significantly higher than previous year due to extra reminders and time allocation. In 2014 and 2015, 61% and 23% of students accessed the modules after the class, respectively, showing that they either wanted to review the material after the course or wanted to complete the module after it was covered in the class. The average completion time was 6.5 minutes. In conclusion, (a) online module and in class polling activity successfully increased students engagement with the content and helped them to see benefits and to complete the module after the class, (b) reminders and allocated time to complete the module increased the engagement & completion of the online module, and (c) using technology in the classroom helped the lecturer gage the level and understanding of students.

Reference:
Integration of technology into teaching and personalized learning are two elements of the theme of educational excellence of UNSW 2025 Strategy. They are in alignment with UNSW Institute of Languages (UNSWIL) mission to create flexible learning environments to empower students to realize their academic potential. The primary focus of English language courses offered at UNSWIL is to improve international students’ language skills prior to the commencement of tertiary studies at UNSW thus boosting their linguistic confidence.

Considerable research evidence shows many benefits of extensive reading to build students language proficiency. Among these is an opportunity to increase students’ vocabulary, grammatical awareness, critical thinking and build positive attitudes to reading. However, many English language students do not read much outside the classroom and often struggle with challenging concepts presented in their core texts (Macalister 2010). Motivating students to engage in voluntary reading has, therefore, been a common challenge for many language teachers.

This poster showcases how 18 students enrolled in University English Language Course at UNSWIL engaged in extensive reading during their 5-week course in April 2016. The project combined voluntary reading at home with follow-up activities in class. Students made their own choice from a selection of online reading material and each week they were asked to complete various while- and post-reading tasks, e.g. vocabulary lists, summaries, reviews etc. These were shared in small groups in class sessions in a relaxed and supportive environment. Student engagement and progress could be tracked through an online progress reporting system which included text length and difficulty level as well as comprehension quiz completion. In their reflective journals, many students commented favourably on the project and expressed their intention to continue using the resources after completion of the course.

Reference:
Video Driven Assessments For Inspiring Shared and Personalised Learning

Dean Utian, Imriya Kamardeen, Graham Hannah
UNSW Built Environment

Video driven assessment provides a range of learning benefits beyond the development of students' skills in digital literacy. It allows for creativity of individual approaches and students finding their own pathways to outcomes, thereby enabling personalised learning. The video assessment can be collaborative and social, involving both private and public sharing of learning output. It encompasses intrinsic motivation where the assessment production is enjoyable, challenging and highly satisfying to students. Most importantly, it can inspire students.

The video approach to assessment closely corresponds to objectives of the UNSW 2025 Strategy and principles of the Scientia Educational Experience, particularly: highly focused on attainment; built on ensuring a personalised student experience; focused on building and supporting learning communities. This poster explores the impact of video assessment within two Built Environment courses around the themes of collaborative learning, creativity and enthusiasm. Construction & Property Economics uses ‘Digi Explanations,’ requiring students to create short videos that demonstrate critical evaluation of design and construction methods in relation to cost and value. Cinematic Space explores the architectural theme of space, place and time through the creation of short films that tell a spatial story and communicate a researched topic. Students learn not simply by doing but by explaining their ideas and research to their peers as well as through organising, planning, collaborating, giving and receiving feedback (Boud 2014).

Personalised learning recognises the diversity of students’ needs, interests and aptitudes and strives to ensure that every learner can achieve to their highest potential. Embedding subject matter and placing students at the centre of the experience further drives personalised learning (Grant & Basye, 2014). Such situated experiences create opportunities for “learners to live subject matter in the context of real-world challenges, knowledge is acquired and learning transfers from the classroom to the realm of practice” (Stein, 1998).

The poster illustrates outcomes and voice of students engaging in video assessment in varied ways, reflecting the collaboration, creativity and enthusiasm in learning. The video accompanying the printed work illustrates the output of students and their inspired learning, and can be seen at: https://thebox.unsw.edu.au/video/video-driven-assessment

References:
**Inspiring UNSW Medicine Student Learning Through the Use of The Reading Game**

Fiona Britton1, Trevor Lewis1, Suzanne Mobbs2, Robert Parker3
1School of Medical Sciences, 2Office of Medical Education, 3School of Public Health and Community Medicine

The Reading Game is an online and answer game played by a class of students based on the course curriculum. We trialled this Moodle-based activity in the Beginnings Growth and Development-B (BGD-B) course in the UNSW Medicine program. The game challenges students to create interesting questions on BGD-B course content so that other students can learn from and improve upon.

Of the 271 BGD-B enrolments, 147 students engaged in this peer-led activity. At the end of the 7 week course, this student cohort wrote 562 questions and answered these questions 14,697 times. Students took the opportunity to also participate in the rating system that is incorporated into the game design, to evaluate questions and provide online collaborative feedback to their peers.

We found the inclusion of the Reading Game into the BGD-B course lifted assessment performance in the end of course exam compared with previous years. Student feedback of the Reading Game was very positive as assessed by course evaluation comments (CATEI) and use of an online survey. Students considered the Reading Game an enjoyable online collaborative activity and reported that their understanding of BGD-B topics before and after using the Reading Game resource was enhanced from 4.1 to 7.4 (on a 10 point scale), respectively.

Overall, the introduction of the Reading Game to BGD-B increased student engagement in course content, enhanced student understanding of BGD-B topics and improved assessment performance. It is viewed as a valuable resource to inspire student learning and improve the student educational experience.

U-Connect builds on something that already happens naturally within student communities by providing experienced students who want to make a difference to their fellow students with formal training and ongoing support.

In times of adjustment, transition, high stress (such as around major deadlines & exams), or personal difficulty, being able to share our concerns with someone who listens fully and gives us a sense of being understood can help us restore our sense of being able to manage the situation for ourselves. This is what peer support is about, and this is what Peer Advisors hope to provide for students they connect with.

U-Connect Peer Advisors are later year students providing individual support and guidance to their peers. Unlike traditional Peer Mentoring programs U-Connect has a greater educational / study support focus and runs throughout the academic year. Students at all levels of study can link up with a Peer Advisor for support, not just commencing students. Peer Advisors have received training to enable them to listen effectively, communicate sensitively, maintain confidentiality, respect boundaries and recognise when and how to encourage referral to professional support services.

The program commenced in semester 1 2016 and attracted volunteers from Business, Engineering, Science, Law, Medicine and Arts. In first semester we trained 25 volunteers and an additional 15 in second semester. As well as one on one contact between Peer Advisors and students we conducted twice weekly Pop-Up sessions at various points on campus. In our first semester Peer Advisors had 360 consultations with students.

As we promote the program more we expect to increase our individual engagement with students. We also plan to conduct faculty specific group study sessions facilitated by the Peer Advisors to enhance study skills and academic confidence in the students who take part.

Students can often be more comfortable talking to a fellow student than a professional. By providing a structure and a context and acknowledging the breadth of knowledge and experience students have to offer we can provide a service to students, a conduit to more formal support services and also provide the volunteers with valuable skills and experience.
Empowering Online Learners Using Assessment and Feedback

Orin Chisholm¹, Lincoln Gomes², Thuan Thai³, Sheri Nixdorf⁴, Rachel Williams⁵, Andrew Clayphan², Lorenzo Vigentini², Lisa Zhang², Catherine Zhao², Mark King², Caroline Ford⁶

School of Medical Sciences, ¹Office of the Pro-Vice Chancellor (Education), ²School of Education, University of Notre Dame, ³Prince of Wales Clinical School, ⁴Hereditary Cancer Clinic, Prince of Wales Hospital, Sydney, Australia; ⁵School of Medical Sciences, ⁶School of Women’s and Children’s Health, Faculty of Medicine, UNSW Australia, Sydney, Australia

The MOOC “Myths and Realities of Personalised Medicine: The Genetic Revolution” was first released on the Coursera platform in May, 2015. This MOOC was designed to deliver flexible and personalised learning using a variety of activities with real-time feedback to empower participant learning.

One of the drivers of the MOOC was to enable participants to follow their own interests by providing a flexible learning environment. Students were able to choose one or more of three different disease streams: cancer, neuroscience or infectious diseases, to focus on in their exploration of personalised medicine. This is a feature unique to this MOOC.

Participants were provided with an array of activities such as a poll on genetics versus environment where they could re-consider their responses after they had completed the course and then compare their answers with those of other participants. Ethical scenarios were developed using Qualtrics for participants to work through. They could review their choices at each step of the scenario compared with others once they had completed the activity. A major emphasis was placed on the discussion forums and students sharing their own knowledge and experience with others in the class. These discussion forums provided students with choice as they could focus on topics that were relevant and of interest to them.

The main assessment task was a short opinion piece that was marked by peer assessment. Participants were provided with a carefully-constructed rubric and clear explanations regarding the peer feedback process. This process ran extremely smoothly, especially given the large number of participants in the MOOC.

Overall, empowerment of participants was a major focus in the development of this MOOC and the varied assessment tasks, activities and feedback options enabled participants to craft their own learning outcomes from their experiences in the MOOC.

Outcomes:
- Participants’ understanding of subject matter before and after completing the course,
- Their overall rating of the course.

<table>
<thead>
<tr>
<th>Top 5 countries:</th>
<th>Male</th>
<th>Female</th>
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<tr>
<td>1. USA - 28.96%</td>
<td></td>
<td></td>
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<tr>
<td>2. Canada - 4.66%</td>
<td></td>
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<td>3. India - 4.09%</td>
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<td>4. Spain - 3.94%</td>
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<td>5. Russian Federation - 3.66%</td>
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**Age data base on Coursera Demographic Survey from 1,433 users.**

**Gender data based on Coursera Demographic Survey from 1,444 users.**
French & Spanish Revamped: No More Back Rows!

Valerie Combe-Germes, Henar Vicente Cristobal
School of Humanities and Languages

The major idea behind the evolution of our French and Spanish language courses has been to shift our classroom-centered teaching into student-centered personalized learning in order to address issues linked with student disengagement from traditional lectures i.e. dwindling attendance, disengaged back rows, unwillingness to ask questions in front of the whole class, abstract complex grammatical presentations and subsequent feelings of powerlessness...

We have managed to solve these issues by integrating what is available in our immediate environment into our teaching:

- Mobile learning with existing online applications on the go is free, easy to access and allows students to apply their knowledge whenever they want;
- Digital technology enables the educators to create course material compatible with blended learning: quizzes, forums, etc. We have used Camtasia to record video lectures for 3 years and can now flip this precious teaching time for group work; it not only promotes flexibility and adaptability (anytime, anywhere, at my own pace) but also facilitates problem-solving;
- New learning spaces such as the Sanako language labs and PALS rooms have enabled us to broaden the scope of our in-class activities: students can connect their own electronic devices and interact with any single group in class. This allows for constant participation while increasing small task-based activities based on actual individual needs: some groups practice listening while others work on their writing skills.
- The Double robot introduces an opportunity to bring the international world to the classroom with international guests directly interacting with some groups.

Peer collaboration has promoted student involvement and sharing of ideas.

- We work faster and we cover more material than previously.
- Students are more engaged because they participate more.
- Each lecture is a big tutorial!

Online apps on the go and learning platforms are used to apply knowledge and practise skills: Voicethread, Study Blue, etc.

PALS rooms enable peer interactive collaboration

"Every student achieves their full potential!" CATBI 2016

"Great way to learn fast and effectively." CATBI 2016

The Double robot brings the world to the classroom.

Flipped lectures with online embedded videos allow students to study at their own pace and provide more useful class time for group work.
Enhancing Equivalency of Distance and Face-to-Face Learning Outcomes Within the Masters of Environmental Management

Alex Baumber, Graciela Metternicht, Daniel Robinson
School of Biological, Earth and Environmental Sciences

The Master of Environmental Management (MEM) Program at UNSW has traditionally tailored its courses to meet the needs of a diverse group of students, including many who work full-time or have other commitments that make it difficult to attend classes on campus. Responses to these challenges have included scheduling classes for weekday evenings, running intensive short courses on campus and offering distance teaching modes for most courses.

Over time, the numbers of students enrolling in distance learning modes has increased, from 22% of all enrolments in 2013 to 37% in 2015. Furthermore, there is evidence that some courses that do not offer a distance learning option have suffered from falling numbers and a concern has arisen amongst teaching staff that distance students are “missing out” on the learning opportunities afforded to on-campus students in various ways.

A Learning and Teaching Innovation project carried out in 2015/16 found the MEM Program to be meeting learning demands, but identified some key areas that require attention. In particular:

- A student survey found distance students had lower levels of satisfaction, especially around the provision of course materials.

- Students and staff both perceived that there were fewer opportunities for distance students to interact closely with staff and other students at present.

- The project found evidence that distance students may be disadvantaged by assessment tasks that are modified or unique.

While the discrepancies identified in these key areas could be seen as evidence that some distance students are “missing out” at present, this is not an inevitable outcome for distance learning. The project identified a range of learning and teaching practices that have been successfully applied by MEM teaching staff, trialled a number of innovative practices, developed recommendations for strategic planning and produced a guide for MEM teaching.

Do distance students have to “miss out”? Ensuring the equivalence of distance and face-to-face learning outcomes within the Master of Environmental Management (MEM) program

In 2015/16 the MEM program at UNSW was undergoing a period of transition, being moved from the Faculty of Science to the Faculty of Arts and Social Sciences. This presented an opportunity to rethink how the MEM is delivered, but also created the risk of losing some institutional knowledge.

One of the key MEM trends of recent years has been the rise in distance enrolments, from 22% of all course enrolments in 2013 to 37% in 2015. This project sought to better understand the needs of distance students, capture knowledge that has been built up over time and identify future strategies for ensuring distance and on-campus students received an equivalent learning experience.

Why do MEM students choose distance learning?

One of the project tasks was a student survey. This survey highlighted that the characterisation of students as either “distance” or “campus” can be simplistic, as around 50% of students utilise a mix of distance and on-campus modes over the course of the MEM program (see Figure 1).

The survey also showed that “distance” can be a bit of a misnomer, as our distance students actually valued flexibility in the timing of their study (due to work and other commitments) slightly more than they valued flexibility in the location of their study (due to physical distance from campus).

![Figure 1: How do you undertake your courses?](Image)

<table>
<thead>
<tr>
<th>Distance</th>
<th>On-campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mostly by distance (75% or more) 9%</td>
<td>Mostly on-campus (75% or more) 19%</td>
</tr>
<tr>
<td>No dominant mode (25-75% by each) 25%</td>
<td>No dominant mode (25-75% by each) 25%</td>
</tr>
</tbody>
</table>

What did we learn from MEM teaching staff?

An MEM teaching guide was produced that highlighted successful strategies from teaching staff, including:

- Effective use of Echo360, online videos, pre- and post-class exercises and course notes
- Online formats for presentations and group tasks
- Encouraging participation in online forums & blogs
- Applying, testing and refining innovative teaching strategies in an adaptive manner

![Figure 2: Campus & Distance marks 2015](Image)

<table>
<thead>
<tr>
<th>Average mark</th>
<th>Campus</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>85%</td>
<td>75%</td>
<td>70%</td>
</tr>
<tr>
<td>80%</td>
<td>70%</td>
<td>65%</td>
</tr>
<tr>
<td>75%</td>
<td>65%</td>
<td>60%</td>
</tr>
<tr>
<td>70%</td>
<td>60%</td>
<td>55%</td>
</tr>
</tbody>
</table>

Do distance students “miss out”? A concern amongst some teaching staff was that distance students “miss out” on some learning opportunities afforded to on-campus students. The project found that such an outcome was not inevitable, but that there were some areas of concern for distance students, such as:

- Lower satisfaction levels amongst surveyed distance students around the quality of learning materials (e.g. recorded lectures).
- Fewer opportunities for interaction with other students and teaching staff.
- Potentially being disadvantaged by assessment tasks that are modified or unique to distance mode (see Figure 2). These are often presentation, group or discussion-based tasks.

Alex Baumber1, Graciela Metternicht1 and Daniel Robinson2

1Faculty of Science
2Faculty of Arts and Social Sciences
We all have a daily connection with franchising – be it as a buyer of juice, fitness services, or fuel, or as a provider such as an accountant, marketing manager, landlord, tax adviser or lawyer. At the international level, franchising is an exciting aspect of global commerce.

This poster will present some interesting and informative data from the first UNSW Business School Massive Open Online Course (MOOC), International Franchising: The World is Yours, that demonstrates: (1) the extensive outreach of online learning (in this case, by way of a MOOC); (2) online learning can create global learning opportunities for diverse groups of learners and in doing so, breaks down cultural, gender and educational boundaries.

International Franchising: The World is Yours was attended by approximately 3,500 learners from 98 countries. Gender balance overall was fairly even, however, the data indicates an imbalance in age groups. For example, this particular MOOC appealed to a greater number of young females (18-25 years of age) than to older males (36-45 years of age). Interestingly, in many countries where a gender imbalance was expected due to gender segregation, there were often similar, if not higher, numbers of female learners actively participating in the MOOC.

In line with the research findings of Adham and Lundqvist (2015), who believe that MOOCs can help remove cultural and social limitations, the data from this MOOC indicates that MOOCs can be attractive to women, especially in conservative nations, because it allows them a freedom of expression in real world settings (such as through participation in online mixed gender classes) and the ability to pursue an education while continuing to maintain the home (as MOOCs can eliminate additional expenses associated with seeking to pursue an education). Additionally, MOOCs can be especially helpful for students (irrespective of gender or cultural background) in countries rocked by instability and where the opportunity to engage in learning might otherwise not be present.

To this end, this poster will demonstrate how online learning using MOOCs such as International Franchising: The World is Yours, can empower participants from diverse backgrounds who face cultural and social challenges of one kind or another.

References:
Developing an Educational Forum with Chinese Neurologists

Yue Huang1, Hong-Quan Jiang1, Ernest Somerville1, Jin-Con Wang2, Zhu-Yi Li3

1Faculty of Medicine, 2Harbin Medical University, China, 3Prince of Wales Hospital, 4Xijing Hospital Affiliated to the 4th Military Medical University, China, 5Tangdu Hospital Affiliated to the 4th Military Medical University

Continuing education in neurology is a challenge, as the field is complex and evolving rapidly, while neurologists have little time to keep abreast of current advances. Our mobile learning forum is a WeChat based platform that offers lectures, discussions, and clinical cases. Our first forum discussion group began on Nov. 29, 2015, and had over 10,000 participants. By 2016 April, we had about 1000 members, 90% of whom were Chinese neurologists. By 2016 July, it had about 140 members forming group 3.

Acknowledgement:

We’d like to thank Drs. Haixia Fan, Chenguang Zhou, Zhiyou Cai, Shenwen He, Xudong Zhang, and other eight volunteers from other eight Chinese universities running the forum together. We’d like to thank Drs. Richard Vickery and John Power, and Prof. Margaret Morris from UNSW Australia for consultation.

References:

CONCLUSION: Through WeChat, groups can form without restrictions of time and cost. The interactions among members, teachers, and with other content provides a system that is learner-centered, knowledge-centered and community-centered. Therein, it generates an effective learning environment for neurological education.
MOOCs Increasing Global Capabilities: PLuS Alliance, Universitas 21 and UNSW Courses

Leonie Ligertwood
Student Life and Learning

MOOCs (Massive Online Open Courses) are open, participatory, and distributed (Baturay, 2015), and offer students the opportunity to develop knowledge and skills including subject-specific content, global understanding, academic and employment-related capabilities.

UNSW has a co-curricular program entitled “Advantage” which has over 450 professional development activities accredited through AHEGS (Australian Higher Education Graduation Statement). Completion of any of the listed programs will be acknowledged with a separate testamur on conclusion of formal studies. UNSW students clearly have an appetite for short courses to develop and extend competencies, as shown by the participation rate in the first MOOC accredited in 2015.

“Critical Thinking in Global Challenges” was developed by University of Edinburgh for students from 17 partner universities involved in Universitas 21 (a global network of research universities). UNSW students comprised 39% of the 1,455 students (the highest participation level) with an exceptional completion rate of 41%. All Faculties were represented, with the largest cohorts from Engineering, Business and Science. Consistent with research (Lui, et al 2015, Velentsianos & Shepherdson, 2015) motivating factors for participation included: to learn new things, try online education, achieve statement of accomplishment, improve career prospects, and meet other students from around the world. For most of the students it was the first time they had studied online. Students found the course structure and delivery beneficial for learning, helpful for current academic studies, and useful in everyday life.

With an increasing number of outstanding and quality MOOCs offered through UNSW, the new Universitas 21 MOOC set to be delivered this year, and our new partnership PLuS Alliance (with UNSW, Arizona State University, and Kings College London), many more MOOCs will be accredited enabling increased co-curricular learning and improved graduate employment outcomes.

References:

Student Feedback: U21 Critical Thinking in Global Challenges MOOC

“Actually putting the skills into practice – I notice myself using the skills when I research for assignments now.” “Writing better arguments, thinking critically about problems on a global scale”
“I really enjoyed the experience of learning online and alongside students from around the world! It was also really helpful to be able to work at your own pace to fit around other commitments”
“The level of global engagement was also interesting as I enjoyed reading the opinions of students from other countries…providing different perspectives from UNSW Students.”
“It improved my career prospects”
According to David Sadler (2010, p. 541), no matter how “expertly and conscientiously constructed”, feedback cannot be the “primary instrument for improvement”. Sadler suggests that feedback is usually a one-way message from teacher to student and questions how well students are able to interpret and learn from this (p. 539). Rather, learners need to actually acquire appraisal experience – the ability to recognise quality and explain their judgements, and develop concepts of task compliance, quality, and criteria (p. 542).

This poster shows how students of TABL5512 Legal Foundations for Accountants were provided with appraisal experience through a purposefully-created peer review activity – a transactional writing activity related to a specific case study that was completed and submitted prior to class. The anonymised, completed sheets were distributed randomly in class and during class discussion of that case study, each student peer-reviewed their allocated paper. At the end of class papers were returned to their authors. No assessment marks were allocated for the activity, and it was repeated four times over the semester.

This poster will highlight some of the outcomes from research done over a number of semesters on this learning design such as the extent to which the activity increased students’ preparation for class and their engagement in the class discussion and related material; and whether the activity helped engender a sense of community.

Reference:
Learning Environments

The Piloting Active Learning Spaces (PALS) initiative aims to develop world-class learning environments at UNSW. These learning environments facilitate and optimise active, collaborative and blended learning, which encourage pedagogical practices that are conducive to an interactive learning experience for students. The PALS initiative addresses two predominant needs in learning and teaching. Firstly, the generational shift, which has produced technologically literate students, who are learning in a conventional classroom environment that doesn’t incorporate or address these literacy skills. Secondly, the PALS initiative promotes successful collaborative learning experiences by modifying the environment to encourage peer interaction, group work and class discussion. This approach enables students to develop their communication skills and cultivate stronger relationships with their peers.

In 2016, SCIF1121 volunteered to use the PALS rooms to implement its new work-integration course, which focused on providing students with the skills to become excellent communicators, collaborators, innovators and leaders. The motivation for using the PALS room was to provide students with a learning environment, which supported and aligned with the pedagogical needs of the course, including direct instruction, group work and technology-based learning.

The 13-week course consisted of 2 contact hours per week in the PALS room, with class sizes ranging from 35-42 students per class. Students participated in a range of activities, which included an introduction to networking, scientific writing skills, public speaking skills, creating a LinkedIn profile, resume and cover letter writing, an introduction to teamwork, leadership and mentoring, interviewing a scientist, discussions on ethics in science and mock interviews.

The current poster will present an overview of the structure and layout of the PALS room, which has informed pedagogical approaches for SCIF1121. The poster will also provide examples of how the PALS room has enabled students to engage in collaborative learning. Finally, the poster will also contain some student feedback about the course and the PALS-focused teaching methodology that has been implemented.

93% of 375 students agreed that SCIF in PALS provided effective opportunities for active student participation in learning.

Changing How We Think About Teaching - A Reflection of the PALS Initiative

Ananthan Ambikairajah, Chris Tisdell
School of Education, Learning and Teaching Unit, Science

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What do the students think?

“It’s super interactive”
“More of these rooms please”
“Very active, much learning”
“I would love more classes in a space like this”
The dilemma in today's academic environments calls for approaches that foster an intrinsic motivation rather than a traditional force majeure. Faced with all the gadgets the fast-moving world has equipped students with, teachers might feel the need to meet their students' aspirations through these gadgets and somehow use this double-edged sword in a way that not only reduces its destructive and distractive effects to the minimum but to maximize its incorporation in the construction of knowledge. This will consequently aid instructors in appreciating the ways in which today's learners think, learn and get motivated and in designing teaching methods which are more compatible with learners' expectations.

The 21st digital natives seem to be grappling with such issues as constant task-switching, short attention span, and relatively high threshold of motivation (Palfrey & Gasser, 2013), which are apparently overlooked in today's classes. In an attempt to resolve these issues, a game-based teaching approach was adopted (in CRIM1010) and some reflections are provided as follows.

Different educational digital games (e.g., Socrative), with specific features such as interactive engagement, competitiveness, teamwork, indirect assessment, instant feedback and incidental learning were applied. The flexibility and diversity of these games offered students the opportunity to bring in their voice into the learning environment and learners' critical thinking ability was capitalized on through the implementation of Problem-Based Learning (PBL) as a compatible and complementary component in game-based methods. This combination posed surmountable challenges whose accomplishment gave learners a sense of achievement while using the tools they are glued to, i.e. cell-phones, pads and laptops. The students' satisfaction in this course, therefore, calls for further studies. This approach can also be employed as a complementary phase to flipped classrooms.

Reference:
Problem-based learning (PBL) requires students to identify the nature and scope of a client-centered problem; gather the information needed to tackle it; and synthesize a solution (Ramsden 2005: 141). These three components of PBL are also necessary in the process of legal problem-solving, which requires the identification of a legal problem or issue(s) relevant to a fact-based situation, the identification of the relevant law to be applied in resolving the problem, and the application of the law to the facts in order to reach a probable solution (Douglas, 2012: 36).

Taxation law is widely regarded as a complex and complicated area of law. It involves a large amount of content which makes it hard to teach and difficult for students to understand. A particular challenge for academics is to engage students with a legal methodology and to provide meaningful and relevant contexts in which to situate the legal content. Context and methodology becomes even more important for those students studying taxation law in isolation from their chosen field of study (Douglas, 2012: 37-38).

This poster outlines how the principles of a learning design, such as problem-based learning, combined with the processes of an adaptive eLearning environment, such as Smart Sparrow, have been used successfully to assist in the understanding of a complex area of Taxation Law by both law students and accounting students. The poster shows how the choice of learning design has informed the choice of learning environment as well as the positive impact it has had on students’ learning outcomes.

References:
Introduction

Students can come unprepared to class and engagement with the content can often be restricted only to the class face-to-face time. Students would be more “ready” if some of the concepts and terms from the class could be provided in a quick and easily accessible manner. The UNSW Medicine program includes courses in Beginnings, Growth and Development (BGD) in both first (BGDA) and second (BGDB) years. Embryology lectures are a key component of these 2 courses and introduces specialised terminology and concepts in human development.

Methods

A set of very brief introductory videos “1 minute embryology” were prepared and made available online before each of the lectures. Moodle links to the videos as well as at the beginning of their online lectures (for example, http://tiny.cc/BGD-GIT). To increase visibility, these videos were also posted in two separate locations, theBox (search for “embryology”) and UNSW Embryology (http://tiny.cc/One_Minute_Embryology). Note that actually preparing and editing a 1 minute video takes substantially longer that simply recording the entire content (Echo360).

Results

TheBox video view logs show student “1 minute embryology” views ranged between 50 to more than 700. Student feedback was that videos helped get them “set” for class. In particular: very brief, easy to access, related to class concepts, introduced new terminology. Second year students made greater use than first year students, but this may also relate to the position of the links on Moodle and lecture pages.

Conclusion

These “trigger” videos engaged students before the actual lecture and also introduced new terms that they would encounter during the deeper learning process within the 50 minute lecture. Reducing the content to a few key concepts also helped the presenter shape the final lecture presentation. The surprise was that students asked questions from the videos and also re-viewed them after the lectures.
Experiential learning in the laboratory: Teaching Complex Biophysical Concepts Using Pain

Stewart Head, Ingvars Birznieks
School of Medical Sciences

Experiential learning is the process of learning through experience, and is more specifically defined as “learning through reflection on doing” (Felicia 2011). As higher education adapts to new expectations from students, experiential learning has become more important. Traditionally third year science students have struggled with the complex biophysical concepts and equations which form the core of our understanding of how excitable tissues, such as nerves and muscles work. We have developed a third year science practical which demonstrates these concepts by active learning. Using a hand grip force recording device attached to the ADI power lab system students perform repetitive comfortable 50% maximum voluntary contractions. Once baseline data has been collected a blood pressure cuff is inflated to cut off blood supply to the hand. The students record their pain score and muscle force is recorded on the computer. Very soon muscle force falls to zero and students experience increasing levels of discomfort and pain. The symptoms resolve a few seconds after cuff deflation. Students learn the reason for the loss of force in the hand and the pain is a consequence of a potassium ion build up in tissues resulting in activation of pain receptors and failure of muscle contraction. Deflating the cuff restores the potassium ion balance and symptoms resolve within a few seconds. Students calculate the magnitude of the effect using the Nernst equation. These biophysical equations and concepts are covered in lectures to enable students to relate the didactic content to their pain experience. There has been a marked improvement of student understanding of these concepts demonstrated by improvement in examination results. Qualitatively students demonstrate high levels of involvement and commonly all members of each group will request the opportunity to act as an experimental subject.

Reference:
Undergraduate students are generally unaware that they are developing professional skills related to graduate capabilities. Development of co-curricular professional skills and capabilities by undergraduates that are linked to formal academic, curricular learning is difficult to capture at the institutional and program levels. The issue that this UNSW Teaching Fellowship project has been addressing is: ‘how do professional skills that underpin graduate capabilities get captured, tracked and recognised for future employability in a research intensive university?’ Use of standards-based, aligned assessment of academic achievement that underpin graduate capabilities has been tracked longitudinally across three science-based degree programs within medicine and science faculties at UNSW Australia. Complementarily to this, a system of professional skills recognition has been developed that can be translated into a simple open badging ecosystem.

A cross-disciplinary process on ‘skills capture’ using ‘ePortfolio blogging’ was developed in the Bachelor degree programs for Medical Science (BMedSci), Exercise Physiology (BExPhys) and Optometry/Bachelor of Science (BOptom/BSc) at UNSW. The BMedSci represents a non-clinical, ‘pre-professional’ degree program that can prepare medical science undergraduates for many pathways including postgraduate studies in medicine, dentistry and research based masters and PhD programs. In contrast BExPhys and BOptom/ BSc degree programs are clinically based, externally accredited and professional in their own right with an obvious pathway to future employability. These programs were deliberately chosen as they can be compared and contrasted for effects, including identity development, across diverse science student cohorts.

Integrating ePortfolios pedagogy with authentic assessment tasks facilitates close coupling of academic/curricular knowledge and professional co-curricular skills development. A focus on reflective practice explicitly raises awareness of co-curricular skills that underpin graduate capabilities at UNSW and links learning outcomes as part of how students prepare for meeting graduate employability standards. Reflective practice has been scaffolded within the reflective OU blog in Moodle. This has also had the effect on infusing co-curricular pedagogy, habit of mind and thinking across context and discipline to facilitate self-directed student learning and reflection on skills development. Skills development will be recognised in ePortfolios with evidence of learning linked to a badging system. These badges of achievement are not necessarily discipline content based, but complement the discipline.

A rubric system has been developed and implemented as a mechanism for capturing and extracting data in order to quantify skills development that can be recognised and badged and that link back to student reflections on learning within ePortfolios. This rubric system is applied to assessment tasks that have been aligned with graduate capabilities and reflective practice. Program-wide tracking of student achievement in professional skills such as teamwork, research communication, critical thinking and knowledge acquisition has been addressed across BMedSci, BExPhys and BOptom/BSc as anecdotal evidence from colleagues and students suggested that these graduate capabilities are highly sought after by stakeholders such as future employers. The mechanism of capturing and quantifying and recognising these skills in the sciences at UNSW Australia and beyond will be discussed.
The thoughtful integration of teaching technology into practice requires aligning course pedagogy and design, with technology and tools to best enhance learning. This can be a daunting task for new as well as experienced course designers, and is compounded by the many ways in which technology and face-to-face learning can be blended. The School of Medical Sciences (SoMS) has a long tradition of teaching innovation, many of which target specific requirements of medical science disciplines e.g. capacity to facilitate interaction with rich media, enhance laboratory sessions, etc. While learning technologies are widely adopted, they are often deployed by individuals across the School, often without visibility to other academics. This project supports the development of a community of practice that enables the use of technology in teaching by leveraging the innovation pockets in the SoMS and providing visibility to other academics thus providing a platform to build staff capability through dissemination, and facilitating further adoption and innovation.

Utilising UNSW Innovation and Development funds (SEF 4), we surveyed the staff in SoMS on their teaching practice, used the data collected to correlate technology with teaching and learning strategies, and built a step-by-step decision tool to aid the selection of teaching technology. The comprehensive toolkit is found at http://www.teachingtools.med.unsw.edu.au. This toolkit further also provides a repository of practice that describes the implementation and evaluation of technology in current teaching practice. Data on the use of toolkit will be presented.
The School of Public Health and Community Medicine's internship course (6UOC) aims to provide students enrolled in the school's Master's programs with the opportunity to gain real-world experience in a relevant health organisation through a workplace internship of 6 weeks full-time equivalent duration (168 hours). The course is run as a capstone program with students required to have completed 24 credit points to be eligible (with a credit point average or above). They are also required to submit a written application and attend an interview.

The aim of the placements is to provide interns with the opportunity to make valuable contributions to healthcare initiatives that may involve areas such as policy, planning, and evaluation associated with the delivery of healthcare services, or the preparation, appraisal, implementation or evaluation of health related projects. The activities and focus of the internship placement will be relevant to the organization and student and can be either project or normal operations-based.

The course has been running since 2013 and has successfully had 63 students complete. As part of the implementation process, guidelines were developed to support organisations and workplace supervisors in hosting students, as well as guidelines for academic supervisors around their roles and responsibilities. It was decided that students would be assessed on their performance in the workplace (20%) as well as on a report aligned with the work that they undertook (80%).

Ensuring that there are sufficient placements that are aligned with the different masters programs (and which also cover the range of specializations on offer) can be challenging. We have three intakes each year and can interview up to 15 students at each time point so we need to have at least 10 placements available. Also ensuring that there are sufficient academic supervisors can be a daunting task (especially as the supervision of interns is not recognized in workload calculations). From the feedback received, students are grateful for the opportunity to undertake the program (see poster for examples). From a student's perspective, there have been trials around organizing international travel/working visa's (especially for our international students) and with workload requirements. Many of our students undertake the program over summer school as they are able to get long service leave from their current position. Unlike undergraduate interns, our students are already working full time, studying part time and will have other commitments.

Looking forward, if we are going to increase the number of postgraduate students going on mobility placements, working with our Alumni will assist with bolstering the number of opportunities. We will also need to focus on educating academics about the value of supervising interns versus supervising coursework students doing semester long research projects. Lastly, if we shift to a different semester pattern, we will need to review how we will offer placements (especially to those students doing placements at a part time workload).

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