The Changing the Face of Higher Education Through Digital Technologies: A Case Study

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ABSTRACT

Universities today face many challenges, brought about in part by changing needs in society, changing attitudes towards higher education, new research into adult learning and the introduction and use of new digital technologies to improve efficiencies and effectiveness in educational delivery and at the same time introducing new opportunities to change the curriculum and methods of teaching and learning. Each country and each university are seeking their own ongoing solutions though many can learn from what other universities are doing, few are able to merely adopt the same strategies. This paper, using a case study approach, explores how one university in Australia is seeking to find sustainable improvements in teaching and learning through a largescale introduction of digital technology solutions, accompanied by a shared and aligned curriculum framework and learning design models as well as capacity building opportunities for its staff and students. This paper first aims to highlight the many changes within this single university and to show how reform has been established through the adoption of a strategic and wholistic approach to change and second through sharing key changes to identify strategies that could be adapted to suit different university needs in their search for sustainable solutions to some of the big challenges we all face.

INTRODUCTION

Higher education across the world has expanded exponentially. Enrolment has exploded and student demographics has diversified. Universities no longer cater for the elite few, who will succeed no matter how good or bad their university education is. Universities have also become big business, bringing into cities and countries regular large sums of money that are ensuring the local population have continued employment in multiple service industry fields. At the University of New South Wales, Sydney (UNSW), for example, Deloitte Access Economics (2015) identified the University had contributed $1.58 billion to the State of New South Wales and had created almost 12,000 full-time jobs in 2014. At the national level, around 500,000 international students are enrolled in Australian universities, bringing into the country an additional $32 billion dollars per year. After iron and coal, international education is the third highest Australian export (Universities Australia, 2018).

With this expansion comes an imperative to maintain numbers and continue to diversify student groups, as insurance for the future, especially as local traditional student demographics starts to wane, the need to search for new student markets, predominantly overseas, expands. These changes require institutions themselves to become more business-oriented, with skills to run the institution not only as a successful research and teaching body but as an organization that can grow and be flexible to change to meet new demands and new initiatives, some of which are short-term markets, others require the institution to market-niche their products, that draws students, not only for the educational experience they will gain, but for the potential to migrate to the country, to gain a foothold for the family based overseas to call a second home and later, a permanent primary home.

At the same time, the expansion, the massification (Giannakis & Bullivant, 2016)) of higher education and the increased diversity requires multiple forms to educational design and delivery of accredited programs as well as the development of just-in-time boutique courses for professional groups living within and beyond the city limits of the institution, but also for those living overseas, that not only want the short courses, but courses that can be micro-credentialed and linked to formal award bearing programs that offer first, second and third awards, diplomas and degrees (Fox, 2015). For example, the New Zealand Qualifications Authority in August 2018 launched a stand-alone micro-credentialed education system that enables both employers, employees and continuing education learners to take short courses, cumulatively from multiple providers, which can act as credit towards varied formal qualifications from across institutions in the country (NZQA, 2018).

With this expansion comes complex new traits in society, perhaps the greatest is from the very professional bodies that have traditionally sought university educated graduates. Large companies such as Google, Apple, IBM, Ernst and Young and Random House (Daly & Bengali, 2014; Maltarich, Reilly & Nyberg, 2011) now search for young employees with no university degree. They ask for those with the right potential to grow into excellent employees of the company, not university graduates that have set theoretical knowledge. This places pressure on universities to re-imagine and re-design their awards and curricula to meet more precisely market needs, as well as provide students with the experiences necessary to work in ill-defined workplaces in the future, as work itself in the knowledge-based economies continues to rapidly change.

At the same time, technologies have created new opportunities for universities to develop and deliver their courses in new ways, through online, mobile and blended learning, including multiple mixes of technology-led solutions to supplement or take the place of face-to-face and traditional modes of teaching and learning (Fox, 2016). Massive Open Online Courses now number over 81 million cumulative learners and are offered across more than 800 universities as well as other organisations. An impressive student number, considering Massive Open Online Courses did not start operation until 2011 (Shah, 2018).

ADDRESSING THE CHALLENGES; ONE UNIVERSITY PLANS AND SOLUTIONS

This paper adopts a case studies approach to explore how one university is meeting the challenges it faces to improve the quality of educational provision. Case studies in this paper are defined as a set of structured descriptions of bounded systems for the purpose of gaining in-depth insights into a particular site of practice, namely a single university (Tight, 2017). Within this changing climate, what are universities, often the bastions of traditional lecture-based institutions doing to meet multiple new challenges?

At UNSW, the knowledge-based economy factors, new technology solutions, multiple delivery pathways, changing and more flexible links to industries and macro and micro environmental scans were taken-into-account in the ten-year strategic plan, named UNSW 2025 Strategy (https://www.2025.unsw.edu.au/). The UNSW 2025 Strategy took 18 months to develop, canvassing opinions and input from as many stakeholders across and beyond the University as possible. The strategy priorities were divided into three key areas, namely academic excellence in terms of research and education; social engagement in terms of a just society, meeting social challenges and knowledge exchange; and global impact in terms of providing international education, establishing international partnerships and supporting disadvantaged communities. To fund this initiative, an extra Australian $3 billion (US $2.1 billion) over a ten-year period was identified. Within the academic excellence, education stream, key projects were funded including the support for capacity building for staff; development and implementation of shared learning designs and delivery frameworks; digital uplift of core courses and programs; development of new

blended and online learning initiatives; a reconceptualization of a university-led approach to student learning experiences; and major changes in both virtual and physical learning spaces. A keystone project was created, entitled 'Inspired Learning Initiative' as an ecological response to address the UNSW 2025. The Inspired Learning Initiative project received Australian $77 million for the first five years of the project and was sub-divided into seven initiatives, namely:

Digital Uplift: This project focuses on the design, development, delivery, and the evaluation of 660 online & blended core courses and programs to provide unique, personalised, and flexible learning experiences for students. To date 120 courses across all eight faculties have been completed. The general plan was to create courses that would be taken by around 75% of first year students across all disciplines as well as courses targeted to second, third, fourth year undergraduate and postgraduate students.

Students as Partners: This project focuses on partnerships with university students as change agents, who share responsibility for creating innovations and improvements to learning and teaching across the university, working closely with academic and professional staff in all faculties. To date, 434 students have been given formal paid and unpaid roles in this project.

1st Year Student Experience: A key to student success is how well students settle into university life and study in the first year. The project recognizes the major cultural, social and academic shift that students have to make when moving from a school setting to universities and from one country to another, often where the medium of instruction is in a second language. This project focuses on identifying student needs, issues, problems and developing first year educational and other support strategies and solutions.

Digital Assessment System: This project explores the potential of digital assessment software systems that can supplement and take the place of traditional assessment practices. The project is trialing a range of large and medium scale digital assessment platforms to inform digital assessment practices and policies for all faculties. In identifying digital assessment solutions comes many major institutional infrastructural changes, such as IT management, examinations systems and processes, training and capacity building of staff and students.

Scientia Education Academy: Has established an body to showcase and promote excellence in teaching, and to cultivate shared communities of practice to advance leadership and inspiration in learning and teaching across the University. Academy members, appointed from their faculties for several years as excellent teachers and educators are tasked with proactive engagement in promoting and supporting good practices. Their work includes running workshops and training sessions, initiating special projects and working with other academics and students to improve educational experiences. At present there are around 40 members of this academy.

Summative Peer Review Process: The aim of this summative peer review observation initiative is for teaching staff to demonstrate effective teaching practice in relation to nine Dimensions of Teaching. From 2019 this summative peer review process will be a requirement for all staff applying for academic promotion (excluding research only academics). New academic staff who engage in teaching will also be expected to have successfully completed the summative review process (https://teaching.unsw.edu.au/peerreview).

Online Community App: This project has developed a socially driven student portal to instigate student-led learning digital space solutions (Notari, Hielscher & King, 2016).

As part of the educational excellence capacity and capability building across UNSW, the institution has created an alternate career path for its academic staff, which offers talented and passionate teachers the opportunity to place a greater focus on teaching and sharing pedagogical practices. Up to 450 academic staff (lecturers, senior lecturers, associate professors and full professors) out of a total of around 3,000 academic staff have chosen to take up education focussed positions, allowing them to teach more without the need to engage in research. This group of academic staff provides a stronger teacher leadership and mentoring perspective with associated benefits enriching the student learning experience at UNSW (https://teaching.unsw.edu.au/education-careers). Education focussed career pathway enables staff to gain promotion to full professor, based on the quality, impact and leadership they have provided in learning and teaching.

The University also provides a compulsory course for new academics who plan to teach, but who do not have a teacher qualification. This ten-week course needs to be completed in the first two years of employment at UNSW. Without successful completion of this course (Foundations of University Learning and Teaching), staff are unable to get a second contract or a continuing position at the university. 225 academic staff completed the Foundations of University Learning and Teaching in 2018, which is run twice per year, both in a blended and in an online mode and is offered also as a Massive Open Online Course. Additional courses offered to academic staff include a Graduate Certificate in University Learning and Teaching and a Master of Education (Higher Education). Staff taking the Graduate Certificate in University Learning and Teaching have their fees for the program paid for and up till 2018 those taking the Master of Education (Higher Education), on successful completion of the programs had their study fees reimbursed. For recently completed PhD students, who are keen to learn how to teach, a short course, Beginning-To-Teach is offered. UNSW also supports education focused staff taking the UK Higher Education Authority teaching fellowship award (https://www.heacademy.ac.uk/individuals/raising-the-quality-and-status-of-teaching-for-individuals-across-the-globe). In 2018, 20 academic staff started Higher Education Authority fellowships and 11 have, so far, completed the award.

SHARED PLATFORMS OF UNDERSTANDING

With the above major initiatives, shared platforms of understanding across the university are essential for curriculum, course design and student learning experiences. The following paragraphs outline these frameworks.

The University has developed its own Integrated Curriculum Framework, offering on an outcomes-based curriculum. The integrated components of the framework, include:

- **"UNSW Strategic Intent** that establishes the institution's aspirations, and broadly defines what students may expect to experience when undertaking an UNSW program or one of its courses (UNSW 2025).
- **Graduate Capabilities (GCs)** are the *generic* knowledge, skills and their applications, attributes and practices that students are required to develop and evidence during and on completion of their studies. They are common for all programs and are mapped with the Program Learning Outcomes.
- **Program Learning Outcomes (PLOs)** prescribe the specific knowledge, skills and their applications, attributes and practices, including GCs that students need to demonstrate in completing a program.
- **Course Learning Outcomes (CLOs)** prescribe the knowledge, skills and their applications, attributes and practices that students need to demonstrate to complete a specific course or courses within a designated program. CLOs articulate with PLOs.

- **Courses & Course Components** comprise a combination of Resources, Activities, Support, Evaluation and Feedback (RASE) required for the full achievement of the CLOs, the PLOs and the GCs.
- **Assessments** evidence learning outcomes and capabilities achieved by the student. Assessment methods can be both formative and summative and are designed to ensure progress in all learning outcomes can be demonstrated and verified.
- **Evaluation** reviews: the effectiveness of courses/programs in developing the graduate capabilities and PLOs; the level of coherence between the courses/program's educational design and the principles inherent in the outcomes-based Integrated Curriculum Framework; the quality of teaching in the courses/program; and students' learning outcomes and experiences".
- UNSW ICF is embedded in the University online academic and information management system or AIMS "as well as other relevant curriculum documents that communicate academic expectations to students. UNSW has adopted the standard terms used to describe key curriculum components, outlined above" (https://teaching.unsw.edu.au/integrated-curriculum-framework). The Integrated Curriculum Framework is also embedded in a new 2018 Program Design and Delivery Policy, requiring all new and revised award programs to comply (https://www.gs.unsw.edu.au/policy/documents/programdesignprocedure.pdf).

To guide staff in designing courses, a shared course design model has been developed, called the RASE, originally developed for use within the University of Hong Kong (Churchill, King & Fox, 2013). The RASE model takes into account factors required to ensure what is seen as quality learning and teaching. Key to the RASE model is that content and resources in teaching a course are insufficient for ensuring that the learning outcomes are fully achieved and that four integrated components must be included. These integrated components are entitled: Resources, Activities, Support and Evaluation (https://teaching.unsw.edu.au/course-design-model-rase). Within the RASE model Resources focus on the course content. Resources can include learning objects, web content, articles, slides and tools, textbooks, lectures notes, multimedia materials, and experiments that support the course curriculum (Churchill, Fox & King, 2016). Resources must be structured to assist students working through the course content towards achieving the learning outcomes of the course.

The second component is called Activities. The Activities component, arguably the most important, focuses on engaging students in active learning. Activities includes tasks that give students opportunities to work through exercises that lead to gaining the skills, the knowledge and the application of the skills and knowledge required to successfully complete the course. Frequently used types of activities include scientific investigations, case study work and problem-based learning. These activities get students to work to resolve issues, problems or tasks set where students demonstrate the process they have completed to come to the conclusions they make.

The next component of the RASE is called Support. Support can take multiple pathways but normally includes good communication, interaction and assistance from fellow students and tutors. This is notably important in technology-led courses where making effective use of the technology software and applications, including the platform and accompanying widgets and add-ons is essential. It should be noted that different students have different knowledge and skills and understandings of making good use of new technologies to support their learning (Kennedy & Fox, 2013) and therefore need support in gaining the application of the necessary knowledge and skills. Support also includes establishing networks that assist students to contact tutors and fellow students online to discuss course content, tasks set, ways to complete group activities, etc. The type and complexity of Support is particularly important when students are studying solely online.

Online students can easily feel isolated and disconnected and need multiple and frequent ways of feeling part of the course of study and part of a cohort of fellow students that they can contact.

Evaluation is the last but not least component of the RASE model. The Evaluation component focuses on structured regular formative feedback to students, which helps student identify how they are progressing through the course. This feedback can be done through for example the use of rubrics to assess student work that can be self- or peer-marked using Biggs' SOLO taxonomy to help give critical but friendly comment (Biggs & Tang, 2011). The Evaluation component of RASE is also designed to be used by tutors to monitor how well students progress through their studies and to identify misunderstandings or poor learning where extra tutorial support is required to enable student' progress. The RASE model has also been incorporated into the Integrated Curriculum Framework (Fox, 2016).

UNSW also draws attention to Universal Design for Learning or UDL. UDL is defined as:

> "UDL is a framework for instruction based on three principles that guides the design and development of curriculum that can accommodate individual learning differences. These principles are based on providing multiple means of: Representation - giving learners different ways of acquiring information, knowledge and skills; Action and Expression - encouraging students to use different ways of demonstrating what they know; Engagement - tapping into learners' interests, challenging and motivating them to learn (Rose & Meyer, 2002). UDL guides the design of learning goals, materials, methods, and assessment with the diversity of learners in mind. UDL emphasises equal access to curriculum by all students" (https://teaching.unsw.edu.au/universal-design-learning-udl).

A core component of educational excellence within the UNSW 2025 is to shift the focus of faculty offerings to students. To assist in sharing and promoting this shift, the University developed the Scientia Education Experience or SEE.

> "The SEE combines educational and experiential domains that takes advantage of UNSW's unique strengths in curriculum design, delivery and evaluation. The Scientia Education Experience has four interconnected domains, namely: Communities; Feedback and dialogue; Inspired Learning through Inspired Teaching; and Being Digital" (https://teaching.unsw.edu.au/scientia-education-experience).

The Scientia Education Experience's four domains are circled by an outer ring that draws attention to the significance of Inspiring Teaching and Students-As-Partners. See Figure 1 below.

The domain Communities focuses on the importance of creating a sense of belonging to and be expected to contribute to both internal and external communities of scholars, learners, global groups, industry and alumni within the discipline. Examples of communities include discipline-based communities of practice, co-designing courses and training programs with industry partners, establishing and maintaining professional networks and Students-As-Partner groups.

The Feedback and Dialogue domain focuses on scholarly engagement and giving feedback on experiences between students and students and between teachers and students. Examples include early formative or summative assessment tasks with feedback, focus groups and feedback loops, formal and informal points in courses when reflection opportunities are provided.

The Inspired Learning Through Inspiring Teaching domain focuses on good experiences for students in formal programs via excellence in the design of courses and programs that align with the Integrated Curriculum Framework, UNSW graduate capabilities and course design models such as the RASE. Examples of this domain include programs that incorporate opportunities for

Work Integrated Learning and programs designed with leading research and industry partners and their needs.

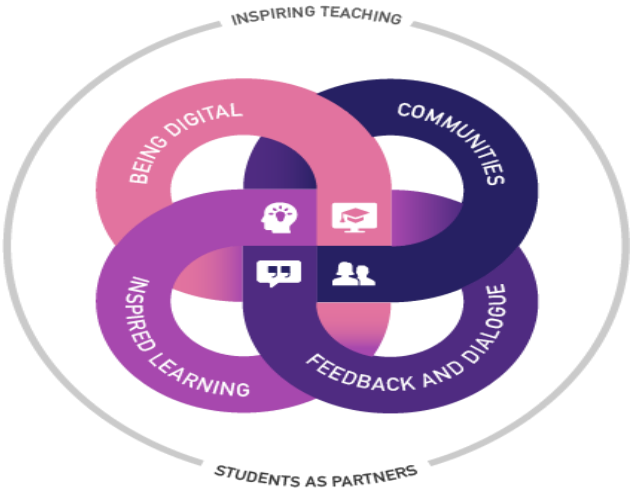

Figure 1: *Scientia Education Experience or SEE*

The final domain is Being Digital. This domain does not focus on the transfer of courses and programs to online teaching per se, but on the transformative nature of using digital resources and in teaching and learning through and with technology. Effective use of technology in teaching and learning requires many new knowledge and skills sets that go well beyond the mere 'shovelware' mentality of transferring lecture materials and placing them within a learning management system (Fraser, 1999). Examples of this domain include using digital technology, based on evidence of enhancements to student learning and outcomes. The adoption of the Scientia Education Experience for the UNSW educational experience, in conjunction with the Integrated Curriculum Framework and RASE aims to promote UNSW values and ensure that programs offered across the University have consistency and a quality not previously attained.

CONCLUSION

This paper aimed to highlight key changes within a single university and to show how reform has been established through the adoption of a strategic and wholistic approach to change. The purpose of the paper was to outline key approaches and projects initiated and to identify strategies that could stimulate discussion towards meeting university needs in their search for sustainable solutions to some of the big challenges we all face. At the same time this paper acknowledges that all university situations are different and that no wholescale adoption of strategies described could be adopted.

UNSW is now in the third year of implementation of the ten-year strategy. Initial reports to-date indicate major changes have occurred across the University, brought on by the Inspired Learning Initiative project and the creation of the 450 education-focussed staff. The role of blended learning and the digital uplift have played a major part in this change. Whether this change is sustainable in the long term is yet to be confirmed. What is clear is that digital technologies are playing a major part in effecting change in this university as well as others around the world.

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