



**UNSW**  
SYDNEY

Australia's  
Global  
University

SCIENTIA  
**EDUCATION**  
ACADEMY

**Annual Report**  
2018

*An integrated  
approach to  
Enhancing  
Educational  
Quality at UNSW*

## Welcome

Welcome to the second publication of the UNSW Scientia Education Academy! In our first publication, we provided an overview of the Academy and the work of its inaugural Fellows. That document helped to articulate the structure of the Academy and provided a basis to guide our work over the last 18 months.

In this second publication, we reflect on the work of the Academy and highlight the impact that this work has had on enhancing the quality of education at UNSW.

The publication consists of three key sections:

1. **Section 1: Formation, Structure and Development of the Academy:** this section provides an overview of the Academy and could be relevant to other institutions that are considering establishing similar academies of educational excellence.
2. **Section 2: An integrated approach to enhancing education at UNSW:** this section provides an overview of key exemplar projects that are being led by Scientia Education Fellows. The impact of these activities is discussed with references to four key themes that influence educational quality:
  1. Teaching and supporting learning
  2. Design and planning of learning resources, activities, assessment and feedback
  3. Content expertise, professional learning and development
  4. Educational leadership
3. **Section 3: The Scientia Education Academy Lecture Series:** this section provides an overview of the lecture series delivered by Fellows of the Academy and includes links to recordings of the lectures.

## Acknowledgements

The work of the Scientia Education Academy (SEA) has been strongly supported by Professor Merlin Crossley, Deputy Vice-Chancellor (Academic), Professor Geoffrey Crisp, Former Pro Vice-Chancellor (Education) and the staff of the PVCE Portfolio.

The contributions made by Professor Geoff Crisp to the formation and development of the Academy is gratefully acknowledged, along with the wonderful work of the inaugural Director of the Academy, Professor Chris Tisdell. The support provided by Remi Hatsumi and Dorota Wierzbica to all the activities of the Academy in general and to this publication, in particular, is greatly appreciated.

This report is based on the contributions made by all Fellows of the Scientia Education Academy. The compilation of the report was led by Chinthaka Balasooriya with significant input from Michelle Langford, Shirley Scott, Gary Velan, Isabella Dobrescu, Nalini Pather, Arianne Rourke, Alex Steel and Chris Tisdell.



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## Message from the Deputy Vice-Chancellor Academic

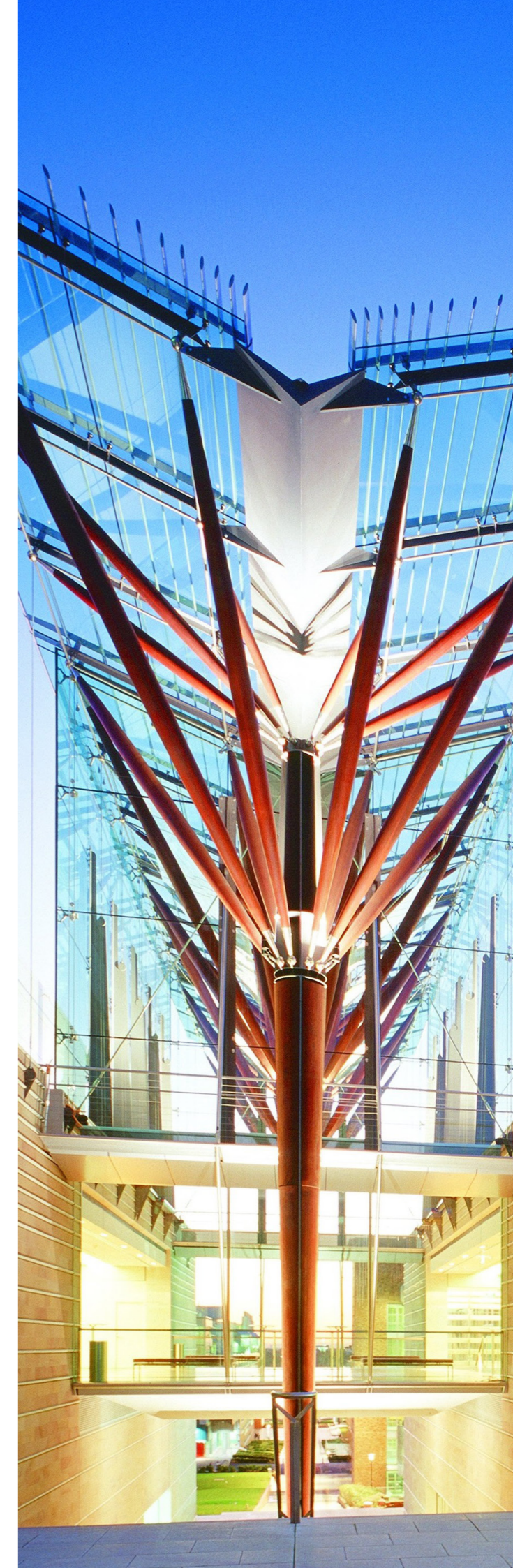
The Scientia Education Academy brings together some of the finest minds at UNSW. Fellows of the Academy work together to improve teaching and the student experience. But this is not an easy task. What makes it particularly challenging is not that nothing works, but that in education everything works. Usually human knowledge advances by trial and error and the errors inform us about what not to do and drive us to try new things. It is usually clear when it is necessary to try new things – if one has a cancer drug that doesn't work, or a plane that doesn't work, it's easy to get people to try something new. In education things are different. Universities have long histories and things work; students learn, graduate and go on to do great things.

Introducing change is the risk. When we try something new it can make people uncomfortable and this makes it difficult to complete educational initiatives and gather enough information to bring people along. On top of that most educators pride themselves on their originality and distinct qualities. They don't always want to fly in someone else's plane. They want to build their own plane and like a novelist or a song writer want to make a distinct contribution.

Nevertheless, we all learn from the collective experiences and innovative endeavours of our peers, especially if our colleagues are seasoned professionals. In this report Fellows of the Scientia Education Academy come together to document their activities and to record their achievements. The very act of producing the information brings the team together and the paper serves as a resource for others wishing to use and adapt the initiatives, as well as for those who just want to get to know the team and feel a part of the community.

**Professor Merlin Crossley**

Deputy Vice-Chancellor (Academic)  
July 2019





## SECTION 1:

# Formation, structure & development of the academy

### What is the Scientia Education Academy?

The UNSW Scientia Education Academy champions, inspires and celebrates excellence in education.

The Academy harnesses the expertise, drive and enthusiasm of the Scientia Education Fellows to enhance learning and teaching across UNSW.

Established in late 2016, the Academy is intrinsically linked to promoting the unique UNSW Scientia Education Experience.

The strategic vision of the Academy is to:

- > promote a scholarly, evidence-based approach to education
- > champion innovation
- > enhance the student experience
- > advise on policies and strategies
- > model a collegial community of leadership that drives educational excellence

### The role of the Academy and its Fellows

The Scientia Education Academy recognises outstanding educators for their leadership and contributions to enhancing education. The academy gives the Fellows a platform to influence the wider educational community through exemplary educational practice.

Appointed from across all UNSW faculties, the Scientia Education Fellows share a genuine passion for enhancing student learning experiences and outcomes.

The Fellows champion educational excellence by:

- > providing leadership and vision for learning and teaching across UNSW and in the higher education sector
- > enhancing the profile and quality of learning and teaching within UNSW, including innovation in curricular design and delivery
- > contributing to developing educational strategy, the Scientia Education Model and improvements to teaching practice within UNSW
- > contributing to positioning UNSW as an exemplar institution for student experience and outcomes
- > modelling high-quality educational practice and contributing to scholarly evaluation of learning and teaching

Further details of the UNSW Scientia Education Academy are available at:

[unsw.to/sea](https://unsw.to/sea)



## Founding leadership structure and subsequent changes

The Academy features a non-hierarchical structure. To assist with operations, in 2017 the Fellows created four leadership roles and elected the following Fellows to these roles



**Director**  
Chris Tisdell



**Deputy Director  
(Educational Scholarship)**  
Chinthaka Balasooriya



**Deputy Director  
(Teaching Practice)**  
Michelle Langford



**Deputy Director  
(Educational Policy)**  
Alex Steel

These roles include duties such as:

- > providing vision for the Academy
- > leading the mission and strategic intent of the Academy
- > advocating for the Academy and the Fellows
- > acting as spokespersons for the Academy.

## Changes to the leadership structure

The founding leadership team played a key role in defining the structure and role of the Academy, and established processes to guide the Academy into the future. This structure was articulated in the 2017 Annual Report.

Following one year of outstanding work, in December 2018, the Founding Director Chris Tisdell stepped down from his role as he accepted a leadership position within another university. The major contribution that Chris made to establishing the Academy and his strong leadership during the initial stages, is formally acknowledged.

In December 2018, Alex Steel was appointed as Acting Director. In March 2019, he was appointed as the Acting Pro Vice-Chancellor (Education), and

thus stepped down from his acting director role. The significant contributions that Alex made to the Academy, initially as the Deputy Director (Policy) and his contributions as Acting Director, are gratefully acknowledged.

In March 2019, the Academy called for nominations to form a new leadership team. Given that the number of Fellows had grown from 15 to 40, and with a view to accommodating the diversity within the expanded fellowship group, a proposal was made to enable Fellows to share the director role (as two co-directors), in addition to the three deputy director roles. The new team was elected in March 2019 and assumed duties on the 1st of July 2019. The new team consists of Shirley Scott and Gary Velan as Co-Directors, with Isabella Dobrescu, Nalini Pather and Arianne Rourke as Deputy Directors.

In the interim, Chinthaka Balasooriya and Michelle Langford were appointed as Acting Co-Directors of the Academy.



**Current and incoming leadership teams:** Gary Velan, Alex Steel, Isabella Dobrescu, Michelle Langford, Nalini Pather, Chinthaka Balasooriya, Arianne Rourke and Shirley Scott.



## Meet the fellows

### INAUGURAL FELLOWS (2016 – 2020)

Name	Faculty	School
Chinthaka Balasooriya	Medicine	Public Health & Community Medicine
Richard Buckland	Engineering	Computer science
Sami Kara	Engineering	Mechanical & Manufacturing
Michelle Langford	Arts & Social Sciences	Arts & Media
Benson Lim	Built Environment	Architecture & Design
Louise Lutze-Mann	Science	Biotechnology & Biomolecular Science
Simon McIntyre	Art & Design	
Emma Robertson	Art & Design	
Cathy Sherry	Law	
Alex Steel	Law	
Chihiro Thomson	Arts & Social Sciences	Humanities & Languages
Chris Tisdell	Science	Mathematics & Statistics
Gary Velan	Medicine	Medical Sciences



### 2017 FELLOWS (2017 – 2021)

Name	Faculty	School
Tania Bucic	Business	Marketing
Jacquelyn Cranney	Science	Psychology
Terry Cumming	Arts and Social Sciences	Education
Isabella Dobrescu	Business	Economics
Julien Epps	Engineering	Electrical Engineering and Telecommunications
Luke Hunter	Science	Chemistry
Lauren Kark	Engineering	Graduate School of Biomedical Engineering
Alberto Motta	Business	Economics
Philip Oldfield	Built Environment	
Nalini Pather	Medicine	Medical Sciences
Patsie Polly	Medicine	Medical Sciences
Arianne Rourke	Art & Design	
Shirley Scott	Canberra	Humanities and Social Sciences
Leesa Sidhu	Canberra	Physical Environmental and Mathematical Sciences
Prue Vines	Law	
Stephen Ward	Built Environment	
Karin Watson	Art & Design	
Kate Wilson	Canberra	Engineering and Information Technology



**INAUGURAL FELLOWS (2018 – 2022)**

	Faculty	School
Kim Snepvangers	Art & Design	
Melanie White	Arts and Social Sciences	Social Sciences
Dijana Alic	Built Environment	
Peter Heslin	Business School	Management
Natalie Cujes	Canberra	Business
May Lim	Engineering	Chemical Engineering
Marina Nehme	Law	
Silas Taylor	Medicine	Office of the Medical Education
Elizabeth Angstmann	Science	Physics



To find out more about their educational profiles, memberships and projects, please click their photo or visit the website: [education.unsw.edu.au/teaching/scientia-education-academy/fellows](https://education.unsw.edu.au/teaching/scientia-education-academy/fellows)

**Academy timeline – key highlights****Activity/ Events****2016**

- > Appointment of Inaugural Fellows (2016 – 2020) ([Fellows' profiles](#))

**2017**

- > SEIF Grant secured to develop an education portfolio for teaching staff at UNSW (Lead: Gary Velan)
- > Appointment of Director & Deputy Directors
- > Initiated collaboration with Wollongong Academy for Tertiary Teaching & Learning Excellence (WATTLE)
- > Appointment of 2017 - 2020 Fellows ([Fellows' profiles](#))
- > 2017 Annual Report produced
- > Monthly meetings & monthly lectures ([view lectures](#))

**2018**

- > Provided feedback to University's Program Design and Delivery Policy and Procedure
- > Involved in RE-COLLABORATE ([video available](#))
- > Initiated international collaboration with National University of Singapore Teaching Academy (NUS TA)
- > Launch of vox pops video ([video available](#))
- > Article published for International Women's Day ([read article](#))
- > Soft launch of prototype Education Portfolio for academic staff
- > Provided feedback to the University's Student Experience of Teaching Index (SEt-I)
- > Launch of pilot feedback scheme on promotion drafts
- > Formed a sub-group focused on Mental Wellness of the University's staff and students
- > Participated in "Evidenced-based Mentoring for Learning and Teaching" workshop
- > Appointment of 2018 – 2021 Fellows ([Fellows' profiles](#))
- > Established visual identity for the Academy
- > Academy Director Chris Tisdell invited to present at WATTLE
- > Prominently involved in the [2018 Learning and Teaching Forum](#)
- > Monthly meetings & monthly lectures ([view lectures](#))

For more activities, news and events, please visit the website: [unsw.to/sea](https://unsw.to/sea)



## Key activities, initiatives and projects – summary

### Pilot feedback scheme on promotional drafts

*One of the Academy’s strategic priorities for education at UNSW is to model a collegial community of mentoring.*

The Academy trialled a pilot mentoring scheme in 2018. This was designed for academics interested in submitting promotion applications and who needed to make a case about their educational contributions. The SEA scheme provided opportunities for individual feedback and personalised advice from Fellows on draft promotion applications. The feedback included exploring questions such as:

- > What does good teaching evidence look like?
- > How can I strengthen my case for promotion?

**Benefits of mentoring and feedback:** Effective mentoring brings positive outcomes for mentees, mentors and their organisations (Tisdell and Shekhawat 2019). There is a great need for academics at the University to have access to mentors who can help to develop their careers within academia. This initiative uniquely adds to current projects at UNSW, sending out a clear message to our community that UNSW is building a supportive culture - a community working together to collectively raise the quality of education.

Fellows of the SEA warmly took up the challenge of providing feedback under this pilot scheme. This scheme is particularly timely for University staff considering a future promotion along either Education Focussed or Teaching & Research lines – the program is relevant to all academics who need to make a case about their educational contributions.

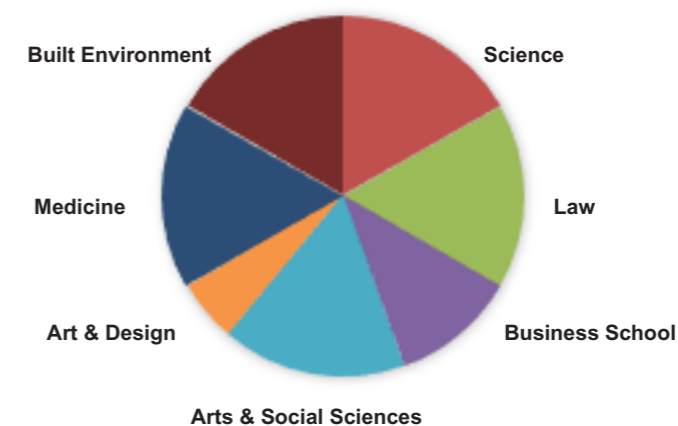
The opportunity: The Academy had the opportunity to play a role in career advancement and development of colleagues at UNSW through this scheme. Fellows critically analysed draft promotion applications and provided feedback to potential applicants. This included comments on appropriate forms of evidence and advice on how the promotion application may be improved.



**Table 1: Summary of the pilot scheme**

Levels	Number of mentees applying for promotion through the pilot scheme		
	Applied in 2018	Successfully promoted in 2018	Applying in 2019
A - Associate Lecturer			
B - Lecturer	2	1	
C- Senior Lecturer	1	1	
D - Associate Professor	2	2	3
E - Professor	7	4	3
<b>Total</b>	12	8	6

**Graph 1: Faculty representation of mentees (applied in 2018 and applying for 2019)**



**Summary:** As noted in Table 1, 8 out of 12 academics (66%) were successful in their promotion application in 2018. The wide representation of Faculties (7 of 9) indicates that the initiative was of interest to our broad community.

### International collaboration with national university of singapore teaching academy

The Academy hosted their first international collaboration meeting with Professor Kumaralingam Amirthalingam (Kumar), Chair of the Teaching Academy, from the National University of Singapore (NUS) in March 2018.

The purpose of Kumar's visit was to:

- > Provide an overview of the NUS Teaching Academy's overall vision and mission;
- > Share further insight into their current and future activities and projects;
- > Exchange knowledge between the two Academies;
- > Discuss and explore potential areas for collaborations

The NUS Teaching Academy (NUSTA) has a nearly decade-long history of engaging with their community in transforming the educational landscape of NUS. As both SEA and NUSTA focus on improving teaching and learning by sharing good practice and facilitating inquiry into educational practices, this was a great opportunity for the Academies to formally meet.

In addition to the group meeting, Kumar and our Fellows had a chance to meet individually and discuss their individual projects and activities. Plans for practical options for collaborations are now being considered at both Academies.

**In January 2019**, SEA Deputy Director Chinthaka Balasooriya had the opportunity to visit Kumar at NUS and discuss potential areas of collaboration related to educational innovation. This includes exploration of critically important aspects such as legal (and ethical) frameworks that will guide education as we enter an era dominated by automation and artificial intelligence.



### Collaboration with Wollongong Academy for Tertiary Teaching & Learning Excellence (WATTLE)

Three of Australia's leading universities have formed a new alliance to harness shared experience, global reach and excellence in innovation. The NUW Alliance, a commitment by the University of Newcastle (UON), the University of New South Wales (UNSW), and the University of Wollongong (UOW), aims to explore some of the short- and long-term challenges impacting NSW to generate benefits for the State as well as the Australian economy.

With a geographical reach from the Mid North Coast to the South Coast – home to 25% of Australia's population - this collaboration is the first grouping of its kind in Australia and is modelled on similar regionally-based research alliances in the United Kingdom and USA.

In 2017, Fellows discussed and endorsed a desire to reach out to members of the NUW Alliance to explore possibilities for collaboration through their respective Education Academies. The SEA has been particularly successful in engaging with UOW's WATTLE (Wollongong Academy of Tertiary Teaching and Learning Excellence). Recent activities include:

- > Meeting with WATTLE Chair – Associate Professor Sarah O' Shea who was a guest speaker at the UNSW L&T Forum 2017
- > Chris Tisdell was invited as a keynote speaker at UOW workshop on Assessment 2017
- > WATTLE representatives were invited by SEA to contribute to the UNSW's 2018 L&T Forum: Oct 2018 Chris Tisdell was invited as a keynote speaker at UOW symposium 2018 (see next page)

The sustained collaborations between our Academies are bringing a number of benefits. Firstly, they are ensuring collaborative advantage by creating opportunities that lead to outcomes of mutual advance, mutual learning, and positive transformations. Secondly, they are enabling the exploration of opportunities to deliver a range of benefits that the Academies could not obtain individually through their own efforts. Finally, they are creating opportunities for mutual learning between our institutions and opening the door for people to make connections that otherwise would not have happened.

We also look forward to advancing connections with UON in the future.





### SEA Director Chris Tisdell invited to present at the UOW's WATTLE symposium

The "Transforming Assessments in Higher Education" WATTLE Hot Topic Group's aim is to promote collaboration between interested teaching and learning practitioners, as well as researchers involved in designing and administering assessment instruments, practices and policies.

In October 2018, Academy Director Chris Tisdell was invited to present at WATTLE's 'Symposium on contemporary assessment practice in higher education'. The main aim of the symposium was to highlight assessment practices that addressed the following themes:

- > Reduction in academic workloads for marking as well as providing effective feedback
- Improvements in student outcomes
- > Scalability of assessments, in terms of numbers and across different areas
- > Overall effectiveness
- > Improved academic integrity

The event was well received based on feedback from both post-event survey and comments posted on social media (hashtag used #assessmentHTG).

### THE ROLE OF THE ACADEMY IN INFLUENCING UNIVERSITY POLICY

The following policies were approved or discussed at Academic Board last year. SEA Fellows provided significant input into the final form of these policies. Academic Promotions Policy

- > Academic Promotions Procedure
- > Thesis Examination Procedure
- > Program Design and Delivery Policy
- > Program Design Procedure
- > Program Delivery Procedure
- > Early Career Academic Support Policy

In particular, the Academy co-ordinated submissions relating to the Program Delivery Procedure.





## SECTION 2:

# An integrate approach to enhancing educational quality at UNSW

Higher quality student learning is at the centre of all our efforts related to educational quality. Educational quality is influenced by numerous factors, including but not limited to teaching excellence. Supported by the UNSW Scientia Education Investment Fund (SEIF) grant awarded in 2017 (led by Professor Gary Velan), the Academy undertook an overarching project to develop a guiding framework to capture the multiple dimensions of effective teaching, and to develop standards by which to assess quality.

The four key dimensions that were identified through this process are used as themes to structure the discussion around education quality that is presented in this publication. The key themes are:



## Overarching project of the scientia education academy: developing an educational portfolio for UNSW

**Project lead:** Gary Velan

**Grant Team:** All inaugural Fellows of the Academy Introduction

Research has traditionally been rewarded and recognised more than teaching at leading universities such as UNSW. One reason for this disparity is that measures of research excellence are widely used and accepted. In contrast, there are no generally accepted measures of teaching excellence.

This project built on existing literature and evaluation tools to develop measures of educational excellence at UNSW that can be used to provide essential feedback to staff about their teaching performance. These measures can be used to evaluate and reward excellence via teaching awards and academic promotion. Members of the Scientia Education Academy collaborated with national and international experts in educational evaluation to develop appropriate measures for use at UNSW. These measures are standards-based, thereby providing transparency regarding the level required at UNSW to achieve educational excellence across a number of criteria. The measures and associated performance standards, guidelines and exemplars across a variety of disciplines have been refined following feedback from students and staff, including Heads of School and Associate Deans Education, in all Faculties at UNSW. The measures are now being piloted to support reflective practice in education and its recognition in teaching awards and academic promotion.

### Theoretical background

Attempts to evaluate teachers and teaching in higher education date back many years, and have always proved to be problematic (Marsh, 2007). Existing literature reveals controversy regarding the reliability and validity of student feedback surveys, peer review of teaching, education portfolios and student learning outcomes as measures of educational excellence

(Marsh, 2007; Gunn and Fisk, 2013). Even the concept of 'teaching excellence' in higher education is ill-defined and controversial (Gunn and Fisk, 2013; Wood and Su, 2017). Indeed, many academics consider educational excellence to be 'unmeasurable' (Wood and Su, 2017). Nevertheless, policy measures such as the UK Teaching Excellence Framework are intended to raise the standard of teaching across all universities. In the current global environment for higher education, it is appropriate that institutions such as UNSW develop rigorous measures to recognise and reward excellent teaching.

While we recognise the importance of this, we face a key practical question: how can the multi-dimensional concept of educational excellence be measured? Ideally, valid measures of the inputs (qualifications and professional development), process (teaching practice) and outputs (i.e. student learning) of education would all be incorporated. Evaluating student learning as a measure of teaching is clearly of great importance. However, many contextual and institutional factors affect students' learning, hence the influence of the teacher is difficult to isolate. Indeed, Gibbs (2016) asserts that measures of learning gains would be the most appropriate indicator of quality teaching, but such measures are not yet available. Furthermore, better measures of the learning and teaching process, such as student engagement surveys, require further development.

Marsh (1982) developed the SEEQ (Student Evaluations of Educational Quality) questionnaire, through which nine valid and reliable dimensions of effective teaching were characterised, and have since been demonstrated to be robust and stable across multiple disciplinary and cultural contexts (Marsh and Roche, 1994):

1. Learning/academic value;
2. Lecturer enthusiasm;
3. Organisation and clarity;
4. Group interaction;
5. Individual rapport;
6. Breadth of coverage;
7. Examinations/grading;
8. Assignment/reading; and
9. Workload/difficulty.



Marsh (2007) concludes that the SEEQ and other validated student surveys are the most robust metrics to evaluate teaching. However, the SEEQ instrument has now largely fallen out of use, with most universities having their own unit evaluation instruments (Boud 2017, personal communication), e.g. myExperience at UNSW. Furthermore, there are known issues with student ratings of teachers, for example gender bias. This phenomenon has been observed for many years, and was recently elegantly demonstrated in a controlled study by McNell and colleagues (2015) in the online environment, and more recently by Fan and colleagues (2019) at UNSW. Therefore, corroborating measures of educational excellence are required. Marsh (2007) contends that peer review of teaching is somewhat less reliable than student surveys as a measure of teaching excellence, unless there is direct observation of teaching behaviours utilising well-defined criteria. Such an approach has been developed by Crisp and colleagues (2009).

While student surveys and peer review of teachers have roles to play in evidencing educational excellence, they do not provide a comprehensive view of educational practice, either alone or in combination (Beckmann, 2016). More holistic measures of educational excellence are therefore required (Gibbs, 2008). In that regard, the SEEQ dimensions map well to the criteria for teaching excellence awards originated by the Australian Learning and Teaching Council (2008), except for the final criterion (Devlin and Samarawickrema, 2010). Interestingly, Marsh (2007) acknowledged that the dimension of scholarship would add to the valid assessment of effective teaching. Further, Devlin and Samarawickrema (2010) advocate modifying and expanding the criteria below to include measures of student engagement and educational leadership:

1. Approaches to teaching that influence, motivate and inspire students to learn;
2. Development of curricula and resources that reflect a command of the field;
3. Approaches to assessment and feedback that foster independent learning;

4. Respect and support for the development of students as individuals; and
5. Scholarly activities that have influenced and enhanced learning and teaching.

The above criteria also fit well with Ramsden and colleagues' (1995, p.24) listing of the qualities of good teachers:

- > Good teachers are also good learners; good teaching is therefore dynamic, reflective and constantly evolving.
- > Good teachers display enthusiasm for their subject, and a desire to share it with their students.
- > Good teachers recognise the importance of context and adapt their teaching accordingly; they know how to modify their teaching strategies according to the particular students, subject matter, and learning environment.
- > Good teachers encourage learning for understanding and are concerned with developing their students' critical thinking skills, problem-solving skills, and problem-approach behaviours.
- > Good teachers demonstrate an ability to transform and extend knowledge, rather than merely transmitting it.
- > Good teachers set clear goals, use valid and appropriate assessment methods, and provide high quality feedback to their students.
- > Good teachers show respect for their students; they are interested in their professional and personal growth, encourage their independence, and sustain high expectations of them.

The UK Higher Education Academy (2011) developed a [professional standards framework](#) for teaching and supporting learning in higher education. That framework distinguishes three dimensions for educators: areas of activity (e.g. designing and implementing learning activities and assessment); core knowledge (e.g. disciplinary and pedagogical understanding); and professional values (e.g. respect for learners and continuing professional development). Educators must demonstrate that they fulfil criteria within each of the dimensions in order to become a Fellow of the Higher Education Academy. Descriptors of the levels of attainment for each dimension enable





classification into Associate Fellow, Fellow, Senior Fellow and Principal Fellow. Movement between classifications requires evidence of progressively deeper and broader contributions to the institution and the higher education sector. This framework has been reported to support reward and recognition of teachers at UK universities, as well as impacting positively on institutional support for educational excellence (Turner et al., 2013).

Gunn and Fisk (2013), in their review of the literature for the UK Higher Education Academy, list the following dimensions of individual excellence in teaching practice, which differ somewhat from the professional standards framework:

<p><b>Planning and delivery</b></p> <ul style="list-style-type: none"> <li>&gt; Curriculum design</li> <li>&gt; Knowledge of the subject</li> <li>&gt; Ability to inspire and motivate</li> <li>&gt; Respect, care and kindness for students as individuals</li> <li>&gt; Active and group learning</li> </ul> <p style="text-align: right;">Critical and scholarly</p>	<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>&gt; Conscientious use of formative feedback</li> <li>&gt; Creative and innovative approaches to feedback</li> <li>&gt; Offering students a range of assessments to assess their mastery</li> </ul>
<p><b>Contributing to the profession</b></p> <ul style="list-style-type: none"> <li>&gt; Innovation in delivery, assessment, feedback, evaluation, technology</li> <li>&gt; Significant contribution to curriculum renewal and reform</li> <li>&gt; SoTL</li> <li>&gt; Participation in formal networks focused on teaching excellence</li> <li>&gt; Broader leadership in teaching</li> </ul>	<p><b>Reflection and evaluation</b></p> <ul style="list-style-type: none"> <li>&gt; Reflecting on inadequacies of own teaching</li> <li>&gt; Degree of diligence in actively engaging with and responding to student and peer feedback and evaluations</li> </ul>

Professor Denise Chalmers and colleagues (2014) developed the [Australian University Teaching Criteria and Standards](#), which have been adopted by a number of institutions. The AUTCAS criteria include:

1. [Design and planning of learning activities](#)
2. [Teaching and supporting student learning](#)
3. [Assessment and giving feedback to students on their learning](#)
4. [Developing effective learning environments, student support and guidance](#)
5. [Integration of scholarship, research and professional activities with teaching and in support of student learning](#)
6. [Evaluation of practice and continuing professional development](#)
7. [Professional and personal effectiveness](#)

Based on the literature cited above, the most appropriate method to evaluate dimensions of teaching excellence would be to utilise education portfolios, in which academic staff present evidence of achievement and reflection related to each dimension. Standards-based evaluation of teachers' education portfolios will utilise a consensus set of dimensions, selected from those generated by the Higher Education Academy (2011), Gunn and Fisk (2013), Ramsden (1995) and Devlin and Samarawickrema (2010). If metrics derived from student surveys of teaching quality and peer review of educational practice are incorporated within the portfolio, this could provide an acceptable measure of individual teaching quality at UNSW. Integrating student survey data and peer review outcomes into the education portfolio will help to ensure that no measure is viewed in isolation, as well as embedding the education portfolio within existing structures at UNSW.

This project aimed to deliver the following outcomes:

1. Development of performance **standards, guidelines and exemplars** for an education portfolio for UNSW staff;
2. Development of **guidelines for the evaluation** of education portfolios, useful for reviewing applications for teaching awards and academic promotion.
3. An **integrated measure** of educational excellence at UNSW, with the education portfolio incorporating outcomes of student surveys of teaching quality and peer review of educational practice.
4. Establishment of a **community of practice** that enables and supports academic staff in standard-based evaluation of educational excellence at UNSW.

**Progress and outcomes**

Commencing in July 2017, the project team consulted with higher education experts in Australia and overseas, using a Delphi process to determine the dimensions of teaching practice to be incorporated in a UNSW education portfolio. This Delphi process incorporated academics (n=65) from a variety of disciplines at UNSW, across Australia and internationally, to ensure that institutional and disciplinary differences in conceptions of educational excellence are acknowledged and incorporated into design of the UNSW education portfolio. The first round of the Delphi process identified 13 dimensions of effective teaching practice in higher education. Respondents in the second round of the Delphi process (n=58) prioritised 4 of those dimensions for incorporation into an education portfolio. Already, a community of practice has been established by this process.



The first round of the Delphi process identified the following 13 dimensions of effective teaching practice in higher education:

1. Demonstrates up to date disciplinary knowledge, and applies teaching methods that display an understanding of how that knowledge can be effectively learned
2. Designs and plans effective curricula and learning activities
3. Designs and sequences appropriate assessment tasks together with constructive, actionable feedback
4. Inspires and engages students in learning
5. Promotes collaboration, active learning and critical thinking
6. Communicates effectively with students (listening, answering questions and explaining concepts)
7. Promotes reflection and self-regulation in learners
8. Creates inclusive, safe and positive learning environments
9. Uses technology innovatively and effectively to promote learning
10. Demonstrates educational scholarship
11. Demonstrates commitment to professional development in education
12. Demonstrates professional and ethical conduct in education
13. Demonstrates educational leadership

The second round of the Delphi process and further feedback from the project advisory group and peers at UNSW resulted in four dimensions of effective teaching practice, each associated with a number of criteria.

#### Dimensions of effective teaching practice in higher education

Dimension	Criteria for fulfilling the dimension
<b>Design and planning of learning resources, activities, assessment and feedback</b>	<ul style="list-style-type: none"> <li>&gt; Develops educational experiences with a range of learners in mind</li> <li>&gt; Designs and plans effective curricula, resources and learning activities in line with learning outcomes</li> <li>&gt; Effectively engages students as partners in development of curricula, resources and learning activities</li> <li>&gt; Designs learning activities that encourage critical thinking and self-directed learning</li> <li>&gt; Designs and sequences appropriate assessment tasks together with constructive, actionable feedback</li> <li>&gt; Analyses and interprets assessment results to inform teaching practice Links assessment tasks and feedback to specific learning outcomes</li> </ul>
<b>Teaching and supporting learning</b>	<ul style="list-style-type: none"> <li>&gt; Engages in a feedback dialogue with students to enhance learning</li> <li>&gt; Creates inclusive, safe, and positive learning environments Respects individual learners and diverse learning communities</li> <li>&gt; Effectively engages learners from different educational, cultural and language backgrounds</li> <li>&gt; Inspires and engages students in active learning</li> <li>&gt; Demonstrates support for students and seeks to engage all learners Promotes development of reflective capabilities in learners</li> <li>&gt; Communicates effectively with students (listening, answering questions and explaining concepts)</li> <li>&gt; Uses technology effectively to promote learning</li> <li>&gt; Uses evidence-informed teaching approaches and the outcomes from research</li> <li>&gt; Applies teaching methods that display an understanding of how the disciplinary content can be effectively learned</li> </ul>
<b>Content expertise, professional learning and development</b>	<ul style="list-style-type: none"> <li>&gt; Demonstrates up to date disciplinary knowledge</li> <li>&gt; Uses relevant evidence from literature for their own teaching</li> <li>&gt; Demonstrates knowledge of new developments in own subject/discipline as well as related pedagogies</li> <li>&gt; Reflects on and evaluates own teaching practices Adjusts own teaching practice based on feedback</li> <li>&gt; Demonstrates commitment to professional development in own subject/discipline and pedagogy</li> <li>&gt; Actively participates in professional development, implements new strategies and seeks out learning opportunities</li> <li>&gt; Engages in educational scholarship that informs own practice and that of other teachers</li> </ul>
<b>Educational leadership</b>	<ul style="list-style-type: none"> <li>&gt; Effectively addresses core values and standards in their educational activities Demonstrates professional and ethical conduct in education in line with that of the institution</li> <li>&gt; Promotes collaboration by creating and leading opportunities for colleagues to network and share experiences</li> <li>&gt; Contributes to the growth of others and creates resources for broader teaching and learning community</li> <li>&gt; Demonstrates characteristics of an effective / good mentor</li> </ul>



These dimensions and associated criteria have been benchmarked against existing institutional (UNSW Academic Expectations, Peer Review of Teaching), national (Australian University Teaching Criteria and Standards – AUTCAS; Australian Professional Tertiary Teaching Standards - APTTS) and international (UK Higher Education Academy Professional Standards and Universitas 21 Teaching Standards) frameworks for evaluating teaching effectiveness. A manuscript for publication in a peer-reviewed journal is being developed to disseminate the dimensions and criteria identified by this project.

**Progress**

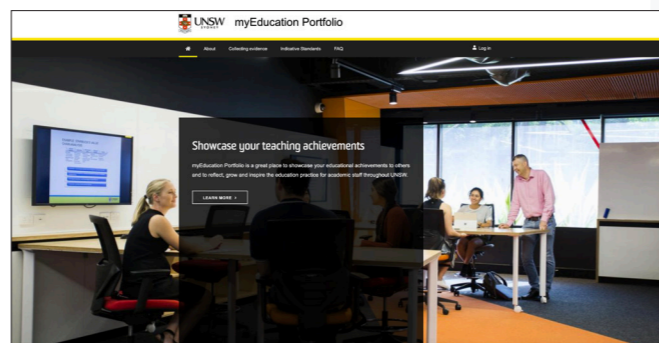
In 2018, the project team scanned the environment for existing ePortfolio tools that might be employed to implement the above-mentioned dimensions and criteria in an education portfolio for UNSW academic staff. No existing software met all the requirements for the proposed portfolio. The UNSW Engagement and Transformation team were subsequently engaged to develop a proof of concept (PoC) for the education portfolio. Members of the project team entered evidence against criteria to test usability and functionality of the PoC.

Subsequently, UNSW IT developed the [myEducation Portfolio](#) production website, which as of June 2019 is available for use by UNSW academic staff (login with zID and zPass is required to create a profile and to view profiles and evidence entered by others).

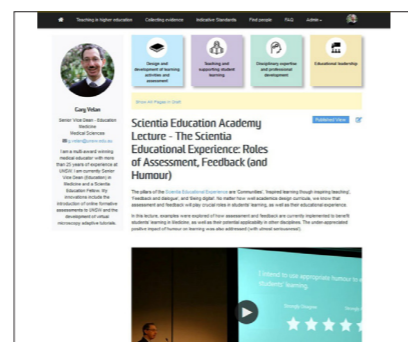
To assist academic staff in developing their education portfolios, the website contains resources on [collecting evidence](#). There is also a guide to [indicative standards](#) and associated evidence applicable to each academic level of promotion. The Scientia Education Academy are currently working with the PVCE, DVCA and Provost to align myEducation Portfolio with the UNSW Academic Expectations Framework, and to incorporate the portfolio into career development, teaching awards and academic promotion processes.

**The themes that emerged from this work form the guiding structure for the next sections of this publication.**

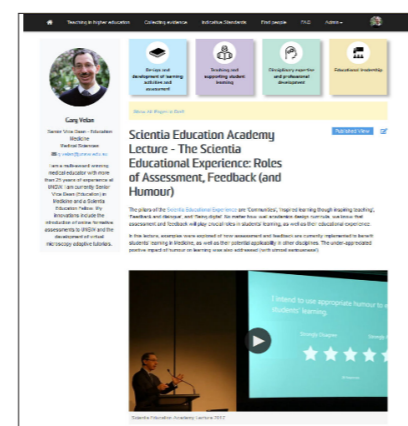
Please see screenshots from myEducation Portfolio below:



myEducation Portfolio welcome screen



myEducation Portfolio example profile screen



An example of evidence included in the dimension of Educational Leadership

**Theme 1: Design and development of learning resources, activities, assessment and feedback**

**Theme editor:** Michelle Langford

**Overview**

The [UNSW Integrated Curriculum Framework](#) promotes an outcomes-based approach to curriculum design and delivery that provides clear pathways for students as they work towards achieving learning outcomes. One challenge of the Integrated Curriculum Framework is to ensure not only that our students attain the relevant learning outcomes and graduate capabilities, but they be able to demonstrate attainment to a relevant standard.

Several initiatives led by SEA fellows are contributing to the aims of this framework. Within this section on 'design and development of learning resources, activities, assessment and feedback', we examine some UNSW initiatives led by SEA Fellows:

- > Faculty of Engineering-Vertically Integrated project (VIP)
- > Faculty of Engineering Industry Engagement
- > A UNSW micro-credentialing ecosystem for recognising learning and skills attainment in capstone courses and internships
- > Understanding and addressing gender differences on STEM exams
- > Immersive technologies: developing evidence-based frameworks for design and implementation

SEA Fellow Sami Kara in the Faculty of Engineering has been developing a model for involving students at all levels of study in Vertically Integrated research projects and has also been working on an Industry Engagement project that aims to bridge the gap between study and work. This involves the mapping of industry requirements to the curriculum at all levels of study.

SEA Fellow Patsie Polly has led an inter-Faculty project to introduce micro-credentialing in capstone and internship courses with a focus on tracing teamwork skills. Micro-credentialing enables students to clearly

see how they are progressing gradually towards each learning outcome and as Polly proposes, the use of 'skills badges' has the potential to enhance curricular records of achievement so that employers may more clearly understand and recognise the competencies attained by graduates of UNSW. SEA Fellow Kate Wilson has been leading a project to better understand why there is a gender gap in achievement on STEM exams. Among the outcomes will be the development of an approach to exam design that is less gender biased and is ultimately aimed at supporting female students in STEM programs to develop greater confidence so that they may progress more equitably towards attaining learning outcomes and graduate capabilities in STEM disciplines.

Further details of these projects are provided below.





## Faculty of Engineering Vertically Integrated Project (VIP)

Led by Sami Kara (school of mechanical & manufacturing engineering, faculty of engineering)

### Faculty of Engineering-Vertically Integrated project (VIP)

UNSW Engineering is considering the introduction of a “Vertically Integrated Projects” Program to our curriculum. VIPs are team-based projects, led by an academic, usually in their area of research. The team comprises students from different year groups (2nd year to Postgrad) and is often interdisciplinary. The project is ongoing over multiple years – as senior students graduate and leave the team, more junior students are recruited in the discipline areas that are needed for the project. Vertically Integrated Projects (VIP) have the potential to significantly contribute to several faculty priorities for education and research, including:

- > Increased exposure of undergraduate students to research
- > Signature student experiences
- > Real-world application of engineering principles
- > Development of teamwork and leadership
- > Scaling up of undergraduate research activity and student-led projects

In the second half of the 2018, in order to operationalise the program, a working group has been set up under the leadership of SEA Fellow Sami Kara. A detail program, project structures and resource requirements have been detailed out and will be submitted to the next DEMC for approval of Head of Schools. In 2019, it is aimed to run a pilot of the program with a select few academic leads as a proof of concept in the UNSW context, with a view to expanding it faculty-wide (and ultimately, university-wide) in the future. As the majority of research projects are multi-disciplinary, there is a huge potential to extend the program university wide. In order to understand the implications, selected SEA fellows have also been invited to working group.

### Faculty of Engineering Industry Engagement

Industry has been the main employer of engineering graduates; therefore, employability of engineering graduates is a key concern. Training for technical skills required in industry has evolved over the years from an apprentice style to a structured university education system, which has created two separate worlds, as a result, university graduates, taught about fundamental knowledge during their university education, need to be retrained in industry so that they can function in industry. This separation has been further widened with the increased student numbers in the last decade, as a result industry readiness of university graduates is relatively poor. Therefore, there is a need to introduce a structured program across the faculty to increase the industry readiness of UNSW Engineering faculty graduates.

**Background:** UNSW Engineering currently has ongoing activities to increase the industry engagement of its students. This project will complement the existing activities in order to develop a structured program across the faculty to increase the industry readiness of UNSW Engineering faculty graduates. The aim of this project is to develop such a program based on worldwide university best practices and industry feedback to increase industry readiness of graduates by mapping out industry requirements in a structured manner along with the degree requirements into four years. The proposed program will be developed based on national and international best practices.

Read more about this project on [Sami Kara's profile page.](#)



## A UNSW micro-credentialing ecosystem for recognising learning and skills attainment in capstone courses and internships

Led by Patsie Polly (School of Medical Sciences, Faculty of Medicine)

**Introduction:** Polly and colleagues see development of a model micro-credentialing ecosystem for recognising skills and competencies in capstone courses and internships that can be longitudinally or transversely adapted and adopted by any UNSW undergraduate and postgraduate courses and programs. The benefit and value of this project is not the specific skills badges themselves but the process of designing such an ecosystem, the guidelines, the framework and the model of how to do it for a UNSW context. Most importantly, how these skills badges may gain global relevance for warranting foundational 21st century skill sets/strengths that have life-wide and life-long value for our learners.

### Aims

1. Engage colleagues across faculties at UNSW to form a community of practice for mapping pathways for graduates' readiness in employability and post-graduate programs.
2. Development and deployment of a badging system/process at UNSW for recognising attainment of graduate capabilities linked to professional skills.
3. Pilot how UNSW skills badges would be: a. issued within Moodle and b. be made visible as emerging skill sets and exportable to external platforms such as LinkedIn to raise student profiles and make graduates competitive for future employment.

Read more about this project on [Patsie Polly's profile page](#).

## Understanding and addressing gender differences on STEM exams

Led by Kate Wilson (School of Engineering and Information Technology, UNSW Canberra)

Women are under-represented in STEM degrees and careers worldwide. There are many reasons for this, including less exposure to science and mathematics at a young age, differences in the way teachers interact with girls and boys, lower self-efficacy and stereotype threat, as well as expectations of peers and family. There are also cultural issues within science that can make it less welcoming for women than for men. Performance gaps are also an important contributing factor, as even if a girl wants to pursue STEM she will not be able to if she cannot meet performance requirements. While girls perform better than boys in both STEM and non-STEM subjects at school, girls under-perform relative to boys on competitive examinations including the Australian Science Olympiad Examinations, the National Standard Examinations and university entrance examinations in India. In many countries, including the two most populous nations on Earth – India and China – it is not school grades that determine university access. It is these external competitive examinations.

This under-performance on competitive examinations contributes in two ways to maintaining the low participation rate of women in STEM. First, for girls taking the examinations, they are less likely to be able to access a STEM degree and hence career if they score poorly compared to their male counterparts. This is a direct effect. Indirectly, poor performance of girls on these types of examinations affects the self-esteem and self-efficacy not only of the girls themselves, but of younger peers who may note the lack of success of girls in accessing degrees and competitive programs.

Read more about this project on [Kate Wilson's profile page](#).

## Immersive technologies: developing evidence-based frameworks for design and implementation

Led by Nalini Pather (Faculty of Medicine)

The project aims to examine the effectiveness of immersive technologies on learning and its impact on the learner and learning communities. Immersive technologies are developing at a rapid pace and is becoming more accessible via hand-held devices. In this project, custom-built VR and AR applications have been developed in collaboration with Immersive Technologies Unit (PVCE), and the Epicentre (Art and Design), and the iCinema (Engineering); and PhD candidate, Nicolette Birbara. The overarching aim of this project is to develop frameworks for effective design and implementation of immersive technology learning experiences and to address challenges such as physical fidelity and visualisation. Collaboration in active learning is a particular challenge for virtual reality. Thomas (ref) explains how the use of technologies such as augmented reality (AR) can allow for effective collaboration in a shared space, where users can see and interact with virtual content that has been superimposed onto the real world while still being able to see each other and receive positional cues from their surroundings. The importance of the natural interaction and exchanging of cues that occurs in face-to-face collaboration became apparent. This project examines student learning in collaborative VR paradigms to enable the development of frameworks for implementation.

The project has delivered several important outcomes, including prototype immersive applications, and design frameworks. A defining feature of this project was its evidence-based focus. To this end, the project has achieved two publications in Q1 journals, and one book chapter. A few examples of the immersive applications include:

- > Fully immersive stereoscopic VR experience incorporating tactile elements, video, audio, and interaction
- > Integrated web-based VR for formative assessment
- > Integrated web-based VR for collaborative learning

### Theme summary

The projects outlined above illustrate how projects led by Scientia Education Fellows contribute to the theme of design and planning of learning resources, activities, assessment and feedback. They do so primarily by taking a holistic approach towards curriculum design, and assessment and by placing a focus on the professionalisation of the curriculum in ways that enable the achievement of learning outcomes to be better represented to potential employers. Kara's two project seeks to ensure graduates are industry ready. Polly aims to develop a platform that will recognise the student learning journey, achievement and emerging professional identity over time. Wilson's project has the potential to address the endemic issue of the low rate of enrolment and completion of STEM programs by females.

## Theme 2: Teaching and supporting student learning

**Theme editor:** Chinthaka Balasooriya

### Overview

Promotion of higher quality learning is, and must always be, the aim of efforts to enhance teaching. While few would disagree with this, some performance measures in higher education institutions may place a disproportionate emphasis on measures of teaching and instructional design, without sufficient triangulation with learning outcomes. An examination of educational theory (for example related to constructivism and instructional design) help us to understand the basis for this potential imbalance. The principles of constructive alignment introduced by John Biggs (2011) help us to develop frameworks to readdress this issue and take steps to ensure that institutional initiatives related to teaching, do in fact lead to higher quality student learning.

Within this section on ‘teaching and supporting learning’, we examine current UNSW initiatives including some key projects that are being led through Scientia Education Fellows:

- > Designing curricula to support student self-management and success
- > Supporting students in their transition to university studies
- > Student well-being in legal education

## Designing curricula to support student self-management and success

**Led by Jacquelyn Cranney (School of Psychology, Faculty of Science)**

This project aims to engage university teachers to learn how to better shape the curriculum environment to support student academic success and the development of self-management capacity. Self-management is the capacity to effectively work toward achieving meaningful goals, and to be flexible in the face of setbacks. Evidence-based self-management is one aspect of psychological literacy, which is the capacity to utilise psychological principles to meet personal, professional and societal needs (psychliteracy.com).

The theoretical framework underpinning the project is primarily self-determination theory, which has received empirical support in diverse contexts, including educational contexts (SelfDeterminationTheory.org). This theory also aligns with key educational theories regarding the design and delivery of the curriculum to increase student engagement and success, and with work engagement models emanating from organisational psychology. The project has had a wide impact across UNSW:

1. Several well-received UNSW, national and international presentations at higher education-conferences and workshops (to academics and student support staff) on the topic.
2. A UNSW Scientia Education Academy Lecture, and an in-depth discussion of this the topic at anAcademy meeting. As a result, PVC-E leadership has ensured that Foundations of University Learningand Teaching candidates are being exposed to the relevant training material; reportedly there has been significant positive feedback on this material.

3. Publication of an accessible book for university students on the topic of evidence-based self-management (“The Rubber Brain” aapbooks.com). Several universities are now adopting this book as arecommended text in their courses.

Read more about this project on [Jacquelyn Cranney’s profile page](#).

## Supporting students in their transition to university studies

**Led by Leesa Sidhu (School of Physical, Environmental and Mathematical Sciences, UNSW Canberra)**

This project focuses on supporting students to effectively deal with the many challenges that they may face in their transition to university learning. This project is of particular significance through its potential to provide the support that students may need, and to address any inequities that may arise due to background or socioeconomic status.

One important aspect of dealing with the difficulties which some students face in transitioning to university is reducing the students’ sense of isolation and helping them feel that they belong to a learning community. Other students find that they are lacking self-management capabilities and require additional support in this area in order to succeed at their university studies. This project will identify issues relating to first-year students’ transition to university studies that are detrimental to their learning and well-being (via a literature review and audit of existing strategies used across Schools at UNSW), as well as devising and trialling transition support strategies to improve their experience. Through an evidence-based approach, the project will examine the relevant literature review report; conduct staff interviews across UNSW Schools and design and trial transition support strategies. Based on the outcomes of these trials, the project will be able to share recommendations for designing successful strategies through “how to” guides for use in other UNSW Schools.

Read more about this project on [Leesa Sidhu’s profile page](#).

## Student well-being in legal education

**Led by Alex Steel and Prue Vines (Faculty of Law)**

This project examines students’ attitudes to legal education. This project is based on prior work by and explores the interplay between students’ attitudes to education, lifestyle pressures that they face, and any potential relationship with their mental well-being. In a first for legal education, students have been surveyed in the first weeks of their degree allowing an insight into students’ initial beliefs and attitudes to university. A second survey of later year students will provide a counterpoint to the views of beginning students. This longitudinal data will allow us to develop a more holistic view of students’ experience of education and allow us to develop strategies to address potential challenges.

The aim is to develop an understanding of law students’ attitudes to their legal education as a way of assisting our understanding of how students are likely to respond to particular methods of teaching and whether particular methods of teaching might aggravate or alleviate any tendency to depression or anxiety, and whether student behaviour outside of the classroom may be a factor. The survey will also provide insights into the intrinsic and extrinsic motivators of student behaviour, and the external life factors that affect that motivation.

**Theoretical Background:** The knowledge that lawyers are disproportionately affected by depression and anxiety compared with the rest of the community continues to confound legal educators who have difficulty determining what to do about it. This study seeks to determine the extent to which students’ attitudes may affect depression and anxiety by considering their attitudes in terms of whether they demonstrate autonomy and internal motivation or external motivation and lack of social connection. These factors are derived from the extensive psychological literature on factors contributing to depression.

Preliminary findings have been presented at a symposium on wellbeing of lawyers in a changing world. Further outcomes from this project will help



other faculties address similar problems within their disciplines and could feed into the larger Scientia Education Academy project on 'Healthy Universities'.

Read more about this project on [Alex Steel's profile page](#) and [Prue Vine's profile page](#).

## Theme summary

The projects outlined above illustrate how Scientia Education Fellows contribute to this important theme of 'teaching and supporting learning'. While we strongly support the UNSW focus on teaching quality, these projects illustrate how we can take a more holistic approach that ensures higher quality student learning. The literature that is highlighted in this section, particularly in relation to student well-being, deserves serious consideration. In a higher education environment which is experiencing an information explosion and is facing challenges through major technological disruption, we need to acknowledge the increased pressures that students face. The ever-present and growing financial challenges that students face, and the resultant competing demands on their time to work while studying, need to be considered. These factors need to be considered within a rapidly changing global higher education landscape. The need to consider the changing needs of the future workforce and the related changing needs of our students, has been highlighted in a number of reports. Key amongst these are reports from the World Economic Forum which highlights the challenges posed by the [4th Industrial revolution](#) and the [impact that this is likely to have on education](#).

The evidence that has been highlighted above, especially related to evidence-based self-management strategies (e.g., time and motivation management, emotional regulation, study strategies) are particularly relevant to our students. These strategies enable increased personal and professional success during both studies and careers, as well as broader positive societal impact, given the leadership potential of graduates. In addition, it is well documented nationally and internationally that the levels of distress experienced by university students is well above average, and this distress is associated with anxiety, depression and suicide. The evidence from legal education suggests that these levels may be even higher in law students (with high levels also reported in professions such as medicine).

The Healthy universities project proposed by the Scientia Education Academy could help integrate the learnings from these projects and develop holistic solutions for the university.

In summary, this section highlights how the work of the Scientia Education Academy is contributing to enhancing student learning through intersecting initiatives that address the multiple factors that influence the quality of the student learning experience.

## Theme 3: Disciplinary expertise and professional development

**Theme editor:** Chinthaka Balasooriya

### Overview

Effective teaching requires the maintenance of up-to-date content expertise by teachers, as well as development of their teaching skills. UNSW has introduced a range of initiatives to support the professional development of teaching staff. Key amongst these have been the professional development schemes that have been developed for Scientia Education Fellows and Education Focussed academics. These schemes support teaching staff to undertake training and development in their disciplinary areas, explore new and emerging areas, and attend relevant conferences.

The Scientia Education Investment Funding (SEIF) grants have also provided opportunities for academics to propose educational projects focusing on particular strategic areas. These grants have led to tangible outcomes, including many that are reported in this publication. The first project noted below (the UNSW Formative Peer Review of Teaching project) was funded by a SEIF grant. Details of this project are provided below:

## The UNSW formative peer review of teaching project

**Led by Chinthaka Balasooriya (Team members: Patrick Rawstone, Reema Harrison, Husna Razee and Lois Meyer) Faculty of Medicine**

This project focusses on collegial review of teaching practices, to foster a culture of feedback and iterative development within the UNSW education community. The Formative Peer Review of Teaching (FPRT) process has been designed with the support of a SEIF grant and was initially trialled at UNSW Medicine, with a view to extending across UNSW. Following its success in medicine, many other faculties (Built Environment, Engineering, FASS) have invited the project team to expand the project to their faculties. Additionally, the EF community has requested that this be widely introduced across the UNSW community – a workshop for this purpose was held on the 29th April 2019.

The FPRT project has delivered many important outcomes, including the opportunity for academics to experience a variety of teaching styles across disciplines. It has also provided a very valuable structure through which to engage in self-assessment, reflection and collegial conversations around teaching practice.

A defining feature of the FPRT process was its well-designed reviewer training component. This included a calibration activity that is conducted through a real-time online rating system, that enables reviewers to independently rate their observations and subsequently allows instant collation of de-identified results to reveal the ratings of the group. This was trialled with a small group of senior colleagues within medicine, refined and implemented more widely across the university.

The relatively simple but targeted innovation that was introduced in this training program – the online rating system that enables instant collation of ratings for discussion within the group – had a significant impact on reviewers. The confidential nature of the online system enabled reviewers to rate within a safe environment and enabled them to see how similar or different their ratings were to those of other reviewers.

This provided a basis for rich discussion amongst reviewers, on the reasons for rating a dimension as high or low. The discussions also allowed exploration of how each dimension was interpreted by each reviewer. That discussion often led to a discussion around teaching quality and what defines good teaching. These discussions were immensely beneficial to all participants as it shone a spotlight on teaching quality. This is a benefit that extends beyond the more traditional benefits expected from the FPRT process.

Training programs have now been conducted for academics at the faculties of Medicine, Engineering, Built Environment and FASS and over 70 reviewers have been trained. The project lead has also been invited by overseas universities to conduct staff development workshops on reviewer training and was also invited to present a symposium on this topic at the Asian Medical Education Conference in April 2019.

This project has therefore had a significant impact on the teaching environment at UNSW. The exponential growth and rapid uptake across disciplines and faculties is particularly heartening. The next step is to ensure that these enhanced teaching practices do in fact translate to higher quality learning. The possibility of seeking student input into the formative peer review process is worthy of discussion.

More detail on the FPRT project can be found at [UNSW Medicine's Formative Peer Review of Teaching page](#).

## Extension of the FPRT project to other faculties: An exemplar case study from built environment

### Led by Stephen Ward and Dijana Alic (Faculty of Built Environment)

Scientia Education Fellows Stephen Ward and Dijana Alic initiated a project at the faculty of Built Environment, to extend the above FPRT project to their faculty. Following consultations with the team at Medicine, the first reviewer training session was conducted in June 2018 and fourteen BE reviewers were trained. The session was led by Chinthaka Balasooriya from Faculty of Medicine under a project funded with a grant from the Scientia Educational Investment Fund. The BE system and procedures largely follow the pattern established by colleagues in Medicine. A BE web page has been created on the staff intranet site – with provision of links for staff to request a review of their teaching and to express interest in being trained as a reviewer: <https://intranet.be.unsw.edu.au/staff/formative-peer-review-teaching-process> (log-in required)

An admin staff member from the AD/E area has been appointed to maintain the system and its records.

**Next steps:** The program was trialled in Term 1, 2019. Following this trial, we will launch a campaign to promote the scheme more widely – seeking both requests for review and expressions of interest in becoming a reviewer. Another reviewer training/ refresher session will be planned for mid 2019.

Read more about this project on [Stephen Ward's profile page](#) and [Dijana Alic's profile page](#).

## Theme 4: Educational leadership

**Theme editor:** Arianne Rourke

### Overview

Leadership in learning and teaching is a collaborative and generative practice that relies for its success on both the individual and the collective, taking action to work effectively towards improving the educational culture within the university environment. This relies on both effective leadership and academics that are willing and prepared to provide quality learning and teaching outcomes (Bryman, 2007). This can be achieved through adopting sound educational scholarship, valuing teacher case-based knowledge, and by supporting students, academics and administrators to work collegially towards achieving educational excellence.

Leaders are acknowledged as people who are trusted, insightful, have empathy and who influence others (Dashborough, 2006). This requires highly developed emotional intelligence, a trait that has been linked to effective academic leadership (Parrish, 2015). Academic leaders also have knowledge, understandings and self-awareness and can effectively use this to influence success in higher education (Scott et al., 2008), while creating a positive working environment for both students and staff.

Amongst the key factors underpinning leadership activities are the leaders themselves, who enthusiastically support, value and nurture both students and staff while building harmony (Johnson, 2002). Leaders promote educational success through mentoring and facilitating educational activities that are aimed at positively encouraging others to succeed within the institution. Bryman (2007) identified that leaders also need: “vision, integrity, consideration and sense of direction” (p.697), along with a firm understanding of the ‘big picture’, while considering the learning and teaching communities’ aptitude, roles and responsibilities.

The SEA at UNSW is a fellowship where educational leadership is recognised, developed and supported through members actively participating in collaborative educational activities where the main goal is to ignite positive developments in learning, teaching, scholarship and policy that benefit the university community as a whole.

Within this section on ‘educational leadership’, we examine current UNSW initiatives including some key projects that are being led through Scientia Education Fellows. These projects demonstrate in action many of the trait, visions and goals discussed above.

- > Evolving leadership, administration, professional development, and culture to establish a substantial, scalable, blended learning strategy at UNSW Art & Design
- > Teaching International Students (TIS) and the Distributed Facilitator Framework (DFF): capturing educators’ Career Development Learning (CDL).
- > Learning in the dirt: university food gardens as teaching tools



## Evolving leadership, administration, professional development, and culture to establish a substantial, scalable, blended learning strategy at UNSW Art & Design

Led by Karin Watson  
(Faculty of Art & Design)

**Introduction & Aims:** The Inspired Learning Initiative (ILI) has been an important catalyst for kick-starting Blended Learning and the wider discussion about digital uplift at UNSW Art & Design. However future funding is limited, and as such ILI will only impact a maximum of 40 courses and falls short of addressing cultural change and the associated implications of blended learning on other operational areas of the Faculty.

This SEIF2 project aims to complement and extend upon ILI by developing a cohesive Blended Learning Strategy that informs all operational areas of the Faculty, including executive, administration, teaching and resources. The masterplan serves as an impetus for widespread culture change across all areas to facilitate the uptake of digital pedagogies to be effective, efficient, scalable and sustainable. This will expand the impact and capability of staff and faculty well beyond these selected ILI courses and help improve the quality, personalisation and flexibility of the student learning experience.

**Background:** This project builds on and develops strategies to action the UNSW Scientia Education Model, in particular 'Being Digital' and 'Inspired Learning Through Inspiring Teaching'. Prior to 2002, a lack of institutional strategy was regarded as one of the main barriers to the implementation and embedding of eLearning in tertiary institutions. (Smith, 2002). Since then, many institutions have included eLearning into their Learning and Teaching Strategies, however most address the introduction and/or implementation of eLearning but fail to address how these might become embedded in institutional practice (DfES, 2003, Stiles, 2003) in order to remain sustainable and scalable. The successful embedding of

eLearning in institutions is often impeded by the failure to effectively introduce culture change or to address change management. Critical issues such as 'one off' staff development training, irregular consolidation of progress, little or no evaluation, and lack of follow through serve as further obstructions (Stiles, 2004).

Consistently applied, truly innovative Blended Learning fundamentally changes the practice of teaching. If all aspects of faculty operations do not evolve considering this, then it becomes difficult to effectively scale and embed blended learning across the faculty in a consistent and sustainable manner.

Read more about this project on [Karin Watson's profile page](#).

## Teaching International Students (TIS) and the Distributed Facilitator Framework (DFF); capturing educators' Career Development Learning (CDL).

Led by Arianne Rourke and Kim Snepvangers (Faculty of Art & Design)

**Introduction:** In 2018 an 'Inspired Learning and Teaching' project in the Faculty of Art and Design was initiated on 'Teaching International Students' (TIS). This initiative included planning and facilitating Faculty-wide Forums for academic staff. At the first TIS Forum in February 2018 at the Australian Museum, Professor Georgina Barton from the University of Southern Queensland presented the keynote, the event was attended by 35 Sessional staff, 7 Educational Developers, 34 Faculty academics, academics from UNSW Faculties FASS, Science & Law and 16 International students participated as Student Ambassadors. There were seven films produced that captured the Forum 1 event, which are being edited into 5 minute short films to be used as digital resources on the TIS Moodle site. Visual and survey data from the Forum was collected and analysed and was used to inform the planning of other 2018 TIS events.

**The aim** of the Teaching International Students (TIS) Distributed Facilitator Framework (DFF) is to enhance teacher knowledge about how to teach International students and increase engagement with their learning. Rather than providing general advice or formulas about teaching for FT/PT and sessional staff, the aim is to impact educational quality at UNSW by focusing on place-based educator driven mentoring, and collaborative events that activate ecosystems and Students as Partners projects. Impact can be gauged through high-level positive educator-led evidence and feedback about new insights and practical strategies that they will now be using as a result of participation in TIS activities in 2018 and 2019.

The DFF models and portrays:

1. Educator-led 'ecologies of practice' that promote new transformative practice-based architectures to address gaps in quality outcomes through 'Inspired learning through Inspired teaching'.
2. Deeper understanding of TIS through active strategies, resources, events and project-based outcomes that value teacher case-based knowledge.
3. Practical application of context-driven content knowledge and pedagogy focused on the primacy of relationships as an enhanced quality measures, in the current techno-driven environment of higher education.

This has been achieved by:

1. Designing a non-hierarchical, generative, interconnected and inclusive Career Development Learning (CDL) model for encapsulating Action Practitioner Research (APR) and Reflective Practice of educators.
2. Facilitating staged and scaffold professional development activities that support and encourage educators in their teaching practice and that provides a framework for documenting teacher case-based knowledge.
3. Develop and produce creative visual learning artefacts as online teaching resources to assist educators in Teaching International Students (TIS) with the focus of improving the International student experience at UNSW.

**Progress / Outcomes / Next steps:** The TIS DFF was presented at The Image 2018 Conference in Hong Kong and the 2018 Australian Association for Research in Education (AARE) at Sydney University. A paper about the TIS initiative was published and presented at the ACEN 2018 conference, which Kim and Arianne co-authored with their PhD student Meg Lomm. Papers on the TIS project have been accepted for the InSea Conference in 2019 in Canada and the Asian Conference on Education and International Development (AEID 2019) in Japan. We are currently working as a Community of Practice (CoP) designing and building a Moodle TIS DFF that will have all the learning artefacts collected so far. The TIS CDL CoP will be further built upon in 2019 by inviting editors and authors from the book series



that Arianne Co-Curated on: 'Transformative Pedagogy in the Visual Domain', which published eight books in 2018 that included 18 Editors; 163 Authors from 25 Disciplines; 21 Countries and 98 Educational Institutions. In 2019 the Moodle TIS DFF will be built with the aim of showcasing UNSW and other invited academics worldwide, peer-reviewed innovative teaching resources that utilise visual learning artefacts. The main outcome will be to provide a variety of multi-disciplinary online creative resources to assist educators towards improving International student learning and to improve the overall learning experience of students at UNSW and beyond.

Read more about this project on [Arianne Rourke's profile page](#) and [Kim Snepvanger's profile page](#).



## Learning in the dirt: university food gardens as teaching tools

Led by Cathy Sherry (Faculty of Law)

One of the most significant effects of urbanisation is the loss of connection between populations and food production. By definition, to be a city dweller means having insufficient space to be food self-sufficient. 50% of the world's population now lives in cities, while in Australia that figure is over 90%. Fewer than 350,000 Australians are currently employed in agriculture. The result is that millions of Australians have no experience or knowledge of growing food. Without an understanding of food production, it is difficult to recognise, let alone address the social, health and environmental problems created by modern food systems (Springmann et al, 2018).

Some city dwellers have always maintained an active role in their own food production. There is a long tradition of allotment gardening in the UK and Europe (Crouch 1998; Lohrberg 2016), and many Australians, particularly within migrant communities, cultivated productive home gardens throughout the 20th century (Gaynor 2006). In recent years, urban agriculture has undergone a renaissance, with young people eager to actively engage with the food system, including rising to the challenge of growing food in limited urban space. While urban agriculture can never make cities self-sufficient, it can supplement other food sources, and perhaps most crucially, it can educate people about food production.

Universities have unparalleled opportunities to capitalise on this enthusiasm for critical engagement with food systems. We can do so, not just through traditional academic work but through hands on, experiential learning. To really understand food, we need to get our hands dirty.

The aim of this project was two-fold. First, to experiment with an experiential component of an existing elective, and second to investigate the ways other universities already use food gardens.



1. ***People, Land and Community LAWS3115/ JURD7515***: This course is a later year law elective that examines the role of private law in urban development. A focus of the course is how we can construct high density cities that are healthy, happy and liveable. One class is devoted to food in cities, and a number of students elect to write 5000-word research essays on urban agriculture. In the final class in s2 2018, with the assistance of Scientia Education Academy Funding, we extended the Law School's existing food garden
2. Research trip to United States: university food gardens were visited in Washington, Oregon and California. Meetings with academics and sustainability officers at eight universities.

Read more about this project on [Cathy Sherry's profile page](#).



### Theme summary

According to Hofmeyer, Sheingold, Klopper & Warland (2015) academic leadership in learning and teaching is evidenced by:

1. Coordinating large courses;
2. Leading teaching teams;
3. Influencing quality learning experiences for students and colleagues;
4. All forms of scholarship;
5. Leading the practical application of new knowledge to solve problems;
6. Influencing work culture & productivity;
7. Embracing a diversity of views;
8. Mentoring others;
9. Cultivating civility and cooperative networks.

Many of the activities listed have been put into practice in the educational leadership exemplar projects discussed above, where the leadership trait of generosity of spirit is applied to promote and support others, while working diligently and collaboratively towards achieving the common goals of improving the student and teaching experience at UNSW.

Marron and Cunniff argue that: "Today's educational leader is dealing with complex issues on a daily basis and economic realities are forcing the educational leadership to become more creative and innovative" (p.145). The SEA fellows work innovatively as a community of leaders discussing the many complexities of achieving quality educational outcomes at UNSW and beyond, while supporting and inspiring others in their educational pursuits and encouraging excellence in all sectors of the university community. In promoting educational success for the university and more importantly the people working tirelessly to ensure this success, SEA provides leadership and vision for not just the current university community but also into the future.

## Other defining projects by fellows

- > Evaluating the opportunities e-portfolios provide for UNSW Canberra
- > Remote Mentoring
- > Culture, Diversity and Community Engagement in Learning and Teaching Discipline
- > Postgraduate Workshop at the International Conference of Japanese Language Education

## Evaluating the opportunities e-portfolios provide for UNSW Canberra

### Led by Shirley Scott (School of Humanities and Social Sciences, UNSW Canberra)

**Introduction:** E-portfolios are increasingly being used in higher education. The majority of Australian universities have now selected one of the off-the-shelf e-portfolio programs for use; there is an annual conference; and in the ACT there is a new community of practice to discuss e-portfolios.

UNSW Canberra was discussing potential strategic and large-scale educational innovations and in response to a comment I made during a meeting of the College Strategy Group, the Rector expressed an interest in our investigating e-portfolios.

I was aware that the Faculty of Medicine and School of Education have been amongst the leaders in the use of e-portfolios at UNSW. Given my interest in them, although no direct experience, I have taken a leading role in the conversation at UNSW Canberra during 2018.

**Aims:** The primary aim was to lead the exploration of e-portfolio use at UNSW Canberra. Although my initial disposition was positive, I was not acting as an advocate so much as a leader in exploring what e-portfolios had to offer, particularly so as to enhance the student experience.

Read more about the project on [Shirley Scott's profile page](#).

## Remote mentoring

### Led by Julien Epps (School of Electrical Engineering and Telecommunications, Faculty of Engineering)

**Introduction:** Videoconferencing has been previously used in teaching extensively for many different purposes. This project has investigated (i) applying it to highly analytical individual electrical engineering problem-solving (which is an unusual context) and (ii) videoconferencing as out-of-hours remote guidance, where the student uses their camera to share exactly their view of the problem they are working on at the time they are undertaking self-directed study, while the mentor advises remotely. Remote guidance of this kind can be seen as an emerging opportunity area for the novel use of technology in education, and will be strongly enabled by both a new generation of wearable devices with 'world-view'/'egocentric' networked cameras, and by the peer-to-peer economy that is disrupting many other businesses.

**Background:** Videoconferencing has been used extensively in online and distance learning. Perhaps not surprisingly, in that context researchers have found that online students supported by synchronous tutorials (Skype) achieved higher results than those with asynchronous tutorials (Strang, 2012). In terms of the requirements for technology support of these synchronous tutorials, application sharing and audio appear to be the most critical elements (Böhne et al., 2004). Telecollaboration in language learning (tandem) is also well-established, and has brought about overwhelmingly positive student experiences, reported for example by Schenker (2017). In STEM disciplines, screencasts in mathematics courses were found to have a positive effect on student performance, although students may not be able to verify their understanding easily (Dunleavy and Dede, 2013). However, there does seem to be considerable potential to meet students' demands for support out of hours (Tisdell, 2017)

**Aims:** To investigate how technology can support students outside of regular hours (e.g. when they are at home engaged in self-directed learning), and allow educators to see what students are doing; point; annotate; share content; share explanations; and share the above with any student who wants to join.

Read more about the project on [Julien Epp's profile page](#).



## Culture, diversity and community engagement in learning and teaching discipline

Led by Benson Lim  
(Faculty of Built Environment)

Culture, diversity and social awareness and responsibility are necessary considerations in the developmental processes of university learning and teaching. In recognising these, several projects and initiatives have been undertaken in 2018.

### Project 1: Personal protective clothing and equipment for women in construction

*Dr. Benson Lim and Dr. Bee Oo*

This project is an extension of the two projects undertaken in 2017, namely: (1) an Investigation of Early Career Women in the Construction Industry: Career Choice, Expectation and Barriers; and (2) Tradeswomen in the Australian Construction Industry. Of these, we have recently received the best paper award for a conference paper developed based on the findings on Early Career Women.

Turning to the current research, the aim is to provide an overview of the accessibility of women to properly fitting PPE in the Australian construction industry. The specific objectives are to: (i) explore the difficulties that women in construction experience in getting properly-fitting PPE, and (ii) examine the relationship between their satisfaction with PPE, self-efficacy and job satisfaction. The targeted respondents for this research include:

1. Women labourers in the construction industry
2. Tradeswomen in the construction industry
3. Professional women in the construction industry (for e.g., Project Manager, Site Engineer, Architect, QuantitySurveyor).

Together with the previous studies, the findings will help informing company management and professional bodies about the current status of PPE issues for women in construction, and thus enable them to develop better targeted strategies to improve their well-being and job satisfaction.

### Initiative 1: CMP Peer Mentoring Program

*Dr. Benson Lim*

Indeed, the CMP peer mentoring program has been going through continuous cycle of development and review since 2017. Of late, the program has been approved by the Head of School from the Faculty of Built Environment and will be ready for official launch in March 2019. Generally, the program involves three types of mentorship (i.e. junior-senior students, senior students-recent alumni, and recent-senior alumni) and one-to-one and group mentoring.

Read more about the projects on [Benson Lim's profile page](#).

## Culture, diversity and community engagement in learning and teaching discipline

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Read more about the projects on [Benson Lim's profile page](#).



## Postgraduate workshop at the international conference of Japanese language education

Led by Chihiro Thomson (School of Humanities and Languages, Faculty of Arts & Social Sciences)

**Introduction:** UNSW postgrad students planned and delivered a PG workshop at the International Conference of Japanese Language Education (ICJLE) in Venice, Italy in August 2018. ICJLE is the most prominent international conference on Japanese language education which attracts participants from all over the world. ICJLE in Italy had about 700 participants. The PG workshop was attended by 32 PGs and 20 academics. PGs presented their 3-minute theses and received feedback, while 4 academics from Japan, Thailand, Sweden, and Italy shared their passages to their current academic positions.

My role was three-fold. First, I supervised my UNSW PGs in planning and delivering the workshop. Second, I liaised with the conference organisers in Italy and the supporting association in Japan in coordinating the workshop. Third, I secured the funds for the UNSW PGs to travel to Italy, and the funds for 25 international PGs to receive registration fee waiver to participate in the workshop.

PGs in the field of Japanese language and linguistics, other than those in Japan, are scattered around the world and it is unlikely for one institution to have multiple PGs in the same field. The PGs are often isolated. The PG workshop provided a venue for the PGs to get to know with each other and share their research to receive feedback. It also provided them with opportunities to think about their future by listening to the talks and chatting with academics from all over the world.

**Background:** The Japanese studies program at UNSW hosts a vibrant Community of Practice (CoP) of its PG students, which has opened its door to PG students and their supervisors in the same field in other institutions. (ref. <http://thebox.unsw.edu.au/video/scientia-education-academy-lecture-professor-chihiro-thomson-march-2018>) Communities of Practice are a theoretical platform that enhances participatory learning by its members who share similar concerns and passion, through their regular interactions. The PG workshop is an attempt to extend our UNSW CoP into an international CoP network.

### Aims:

1. Enrich the life of PGs by offering opportunities to become members of the CoP network. By close association with like-minded PGs, they can enhance each other's research and meet the needs for socialisation.
2. Support the PGs in their pursuit for future careers by offering talks by academics from different regions.
3. Offer a chance to our UNSW PGs to manage and host a PG Workshop at an international conference. They had to contact a variety of organisations, academics and other PGs to do this successfully, through the process they created a valuable network of key persons in the field, world-wide.

Read more about the project on [Chihiro Thomson's profile page](#).

## And back to the future: immersion, uncompromised

**Theme editor:** Isabella Dobrescu

### Overview

As I write this, people around the world are cumulatively spending millions of hours playing videogames. What if we could 'trick' them to take a university course instead, while they still feel they are playing a game?

Research shows that transforming a course into a videogame generates a remarkable increase in engagement and academic achievements across the board, particularly for students at risk (see Dobrescu et al., 2015; 2018; 2019). The mechanism is simple. If learning is indistinguishable from fun, leisure time becomes productive and procrastination is less of a concern.

Seven years of research and software development in the making, Playconomics a technology-enabled learning platform that allows educators to transform traditional course materials into videogames. This is not just gamification (a game layer on top of traditional instructions) nor the addition of small mini-games. We make videogames and courses that are one and the same: immersive, virtual experiences that seamlessly integrate traditional instructions without ever losing the videogame-feel.

But there's more. Playconomics does what Minecraft and Facebook do. It allows students to generate videogame/academic content, so the more students the better. It flips the conventional wisdom: Large Class = Poor Learning. 'The less is more' no longer applies, as more students make for a richer, more meaningful and productive learning experience.

feedback delivery. We dubbed it a "Social Experiment in Learning". To understand why, join the 25,000+ students and 32 innovative instructors from several disciplines (Business, Medicine, Engineering and UNSW Student Experience), using it across various universities and teaching undergraduate and MBA courses ranging from Economics and International Tax to Pediatrics, Renewable Energy and Campus Orientation.

Rooted in research, Playconomics continues to innovate through research and is already influencing the national debate on online learning in Australia (see The Australian, Sydney Morning Herald, 'ABC Economy 2017' TV show). Its impact has also been recognised via:

- > 2017 Gold Medal in Social Sciences – International 'Reimagine Education' Awards, Wharton School,
- > 2016 National Citation for Outstanding Contributions to Student Learning for "leadership and innovation that has transformed the teaching of economics, inspiring multidisciplinary students via immersive experiential learning and empowering them to succeed", and
- > all major UNSW and faculty awards, including the Heinz Harant Award for Teaching Innovation (awarded only once before in UNSW history) and Student Choice Award (twice).

Playconomics is the only platform of its kind worldwide and has so far significantly redefined content and

## Step up: smart tech & education program

Led by Isabella Dobrescu and Alberto Motta

STEP UP aims to develop and sustain an innovative, rigorous and interdisciplinary research program on Education. Think of it as a laboratory committed to identifying 'what works' in education and closing the education achievement gaps. Why should we care? Because we know education drives vital life-long outcomes such as income and poverty, health, parenting, social isolation and intergenerational equity, and eliminating such (racial and socioeconomic) education differences will make for a more just and thriving society for all.

Throughout the life of the project, we aim to identify and involve key stakeholders – scientists, educators, and policy makers – to generate and test ideas that have the potential to transform education (see more specific examples below). We intend this research agenda (i) to position UNSW as a thought leader on the worldwide challenge of successfully meeting the growing education demand, and (ii) to provide a solid platform for sustained knowledge exchange and positive social impact.

This project is closely aligned with UNSW 2025 strategy and commitment to achieving excellence in education and advancing a just society via exceptional research and meaningful social engagement that promote social equity, diversity and justice.

## Roadmap for 2019-2020

The Scientia Education Academy is developing a suite of projects, with a view to facilitating connections across the university and contributing to the experience of our students. We aim to include most, if not all, SEA Fellows in at least one of the projects. This will distribute leadership among members of the Academy, providing them with opportunities to work collaboratively and to contribute in ways that reflect their interests and expertise, as well as their current roles.

This model of distributed leadership builds on the Academy's experience over the last 18 months, where we were able to establish the overarching structure of the SEA. We are now well-placed to articulate feasible strategic aims for the Academy, which are reflected in the projects for 2019-2020 outlined below.

### 'Patching the QILT': A project of the SEA

**Project Leaders:** Gary Velan and Shirley Scott

SEA Project Team: At least one representative from each faculty.

This project fundamentally aims to improve the overall UNSW QILT results. It will go beyond individual Faculty initiatives by taking a holistic, UNSW-wide approach. It will consist of:

1. Reviewing QILT qualitative and quantitative data
2. Reviewing actions already taken by Faculties and University Committees, looking at lessons learned with a view to sharing best practice, rather than duplicating activities.
3. Identifying common factors as well as factors that lie beyond individual programs and Faculties – e.g. actions by central units.
4. Seek evidence of strategies that have been used by UQ and other strongly performing QILT institutions to address these issues.
5. Generate a report on findings, that includes recommendations in the form of strategies based on the data to present to the DVCA and PVCE.
6. Working together with the DVCA and PVCE, help fine-tune those recommendations, and where relevant partner with the pertinent institutional units tasked with implementing those selected recommendations.

### Smart Tech & Education Program – The STEP UP Initiative

**Project Leaders:** Isabella Dobrescu and Alberto Motta

SEA Project Team with representation from all faculties

This initiative intends to implement a rigorous research agenda involving lab and field experiments, surveys and theory to evaluate innovative solutions that are truly transformative and scalable. In doing so, we aim to learn big, essential lessons that can be generalised and employed across different fields around the world. We need to learn more about the education production function and with this research program, we intend to do exactly this and distil its knowledge into viable policies.

We will explore some critical questions. What is the optimal educational design in a tech-driven world? What are the sustainable digital learning solutions that do not compromise on educational achievement? And what are the implications for equity, inclusion and fairness?

Our team – currently spanning across Business, Medicine and Engineering - has started investigating these issues. Fryer, Devi & Holden (2018) conduct a large Randomised Control Trial (RCT) to evaluate whether monetary incentives can increase student achievement. Dobrescu, Motta & Greiner (2015) use a lab experiment to study whether gamification works, while Dobrescu, Motta, Holden & Wong (2018) test the same hypothesis directly in the field. Leveraging the big data generated by gamification, Dobrescu, Motta & Scriven (2018) explore whether machine learning can predict student outcomes early in the semester. King & Thibault (2016) study the effect of interactivity on social engagement and learning, while Dobrescu, Motta, Faravelli, & Megalokonomou (2019) conduct a large RCT to study the effect of social comparisons on social learning and increase student achievement. These are just a few examples of the team's completed work.

Our combined experiences and the current state of the literature, suggest a roadmap for the development of next-gen education tools and methods. Digital learning can be both scalable and highly effective if *interactivity* and *immersion* are properly enhanced (gamification being a prime example). A massively large course can lead to better outcomes than a small

one: by leveraging student collective intelligence and cohort-generated content, social comparisons and machine learning it is possible to reverse the conventional wisdom that 'more students = worse educational outcomes'.

The channels through which such interventions affect educational attainment remain, however, a mystery. Similarly, there is no in-depth analysis of any gender differential drivers, and no investigation of potential avenues to close the educational gap between students. The only way to unveil how the nexus of interactivity-connectedness-engagement works, how learning incentives are transformed, how learning shapes one's experience and how educational objectives are achieved is through solid, rigorous experimentation.

In this vein we have identified several research avenues / potential studies, around issues like: (i) can our next-gen analytics generate accurate (and early!) predictions on a student's final academic attainment based on his/her in-game behaviour within the first days of a semester (a big data approach); (ii) the role of experiential learning on decision timing (and its impact on poor time management and procrastination in online learning); (iii) what are the mechanisms through which multiplayer stimulates engagement people's behaviour, e.g., are gender ratios important?; (iv) what are the mechanisms through which relative performance signals become salient in education – are there any lessons to be learned from leagues and leader-boards?; (v) to what extent can 'learning-by-doing' blend with traditional instructions/ assessments to test abstract concepts (and how effectively), and (vi) high power incentives and the quality of performance – a cautionary tale.



The lessons we will learn extend well beyond UNSW and attempt to scientifically inform the debate on how to address the challenge of meeting the increasing demand for skills with shrinking resources in an efficient and results-focused manner, while ensuring equity, diversity and social justice.

The inaugural STEP UP International Conference on “What Works in Education?” is scheduled for August 22, 2019. Through it, we aim to impact the public policy conversation and foster international collaborations on education research – including strategic global partnerships with other leading institutions.



## Healthy Universities – The HAPPY Initiative

**Project Leaders:** Nalini Pather, Jacquelyn Cranney and Leesa Sidhu

This initiative is well aligned with the UNSW 2025 strategy and seeks to ensure that staff and students flourish in the rapidly changing university landscape. UNSW is well placed to be a frontrunner in this area as it can leverage the Scientia Education Academy that comprises leaders in education and research, well-embedded in each of the Faculties at UNSW. This project encompasses multiple themes. These broadly include: building healthy universities; promoting wellness in the future workforce; and supporting academic leaders to advocate for sustainable work practices and environments. Some critical issues that will be explored include:

- > Whether ‘Sustainable Health’ should be a graduate outcome
- > Integrating mental health and wellness into broader corporate health and wellness programs including in the ‘practice of university’
- > Wellbeing and disruption: adapting to rapid change
- > Building mental resilience for life in transition by embedding relevant concepts in UNSW courses
- > Tackling stigma around mental health
- > Enabling disclosure in the workplace
- > Engaging prevention and early intervention strategies

This initiative has achieved the following milestones:

- > Established a cross-Faculty working party that is focusing on developing a comprehensive strategy
- > Commenced a trial of a mental resilience module within courses across three faculties
- > Initiated a trial postgraduate working party in the School of Medical Sciences

### Other projects currently in development

Several other projects that focus on key educational issues are being driven by SEA Fellows. These projects are in developmental stages and two examples include projects titled ‘Pedagogical Theory, Research and Practice – The Visibility Initiative’ (Ariane Rourke & Kim Snepvangers) and ‘What can we learn from International Student Feedback?’ (Stephen Ward).

In summary, over the next 18 months the Scientia Education Academy will work towards improving the student experience at UNSW at a holistic level. This work will include adding to the evidence base for the implementation of scalable technology to enhance learning, as well as improving the wellbeing of students and staff.



## The future of higher education: implications for UNSW

Chinthaka Balasooriya, Isabella Dobrescu, Nalini Pather and Shirley Scott

### Overview

The fourth industrial revolution (Industry 4.0) refers to dramatic changes that are likely to take place in all aspects of our lives, due to the fusion of technologies that could merge the physical, digital, and biological spheres of life. These developments are forecast to have a particularly significant impact on how we learn and how we work. Reports from the [World Economic Forum](#) highlight the nature of the expected impact on education (2018-2022) and how we may need to re-skill our workforce to meet these challenges. Reports related to particular disciplines (e.g. [the Topol report on the future of healthcare](#)) highlight how the practice of certain professions will change dramatically, requiring universities to respond rapidly and appropriately.

The Scientia Education Academy could potentially play a critical role in leading discussion at UNSW on how to effectively respond to the challenges posed by the fourth industrial revolution. This conversation may well vary across disciplines; there is likely to be a difference between those disciplines with close connections to a profession, such as engineering, law and medicine, and those of a more general nature, such as mathematics, business and humanities.

While there are likely to be disciplinary differences, the drive to educate the world efficiently and equitably cuts across disciplinary boundaries. 'Efficiency' includes sustainability and prudent use of resources, while 'equity' implies giving each student (whether university-enrolled or simply someone wanting to learn) the best way to acquire competence. This largely entails personalised learning experiences that can be tailored to contextual objectives, set clear learning expectations and provide real-time personalised feedback. Everyone learns at their own pace, and the new wave of technology has the potential to provide smart solutions to address the complexities of personalised learning.

The rapidly evolving technological landscape presents many opportunities to understand more about how people of diverse age, gender, culture or vocational backgrounds learn most effectively. This in turn would allow us to develop methods to tailor educational experiences with increasing degrees of precision. We must, however, be mindful of the challenges. For example, how would higher education respond to the explosion in information, not only from research but also from systems that collect vast amounts of data from the population? How soon will we reach a point where humans are no longer able to cope with the massive amounts of data, and machines become essential partners in this process? How will we decide what decisions can be made by machines and what decision-making processes will be retained by humans? Higher Education needs to evolve so that our graduates are equipped to meet these changing needs. The Scientia Education Academy (SEA) could play a significant role in preparing UNSW to meet these challenges. Examples of projects that SEA could lead include:

1. Identifying optimal educational design frameworks for a technology-driven world;
2. Guiding the design of approaches that seamlessly blend learning theories, immersive environments, peer-assessment and interactive feedback;
3. Inviting leading thinkers in this area to speak to audiences at UNSW so as to promote discussion of the global changes underway;
4. Benchmark developments at UNSW against those of leading international universities;
5. Work across the University to lead a discussion as to the most appropriate institutional response to these changes, for example, to develop a guiding framework
6. Lead the discussion on how to address the ethical, moral and legal challenges involved and what these changes mean for how we understand the role of universities.

The above are just a few ways in which SEA could contribute to shaping the educational landscape at UNSW and beyond. The breadth and depth of expertise and experience of SEA fellows can be drawn up on to develop an effective response to these challenges, to place UNSW as a global leader in shaping the future of higher education, in an equitable, inclusive and just manner.





## SECTION 3:

# Appendix 1: Scientia Education Academy Lecture Series

The Scientia Education Academy lecture series is supported by the PVC (Education) Portfolio. Each month, one of the Fellows has made a presentation, addressing a range of educational issues of contemporary significance.

Below are all the lectures to-date (June 2019). Please visit the website to view the lecture recordings.

[unsw.to/sea-lectures](https://unsw.to/sea-lectures)



Enhancing the Scientia of Science



A Conversation with Richard Buckland



Can technology facilitate learning on a level playing field?



The Scientia Educational Experience: Roles of Assessment, Feedback (and Humour)

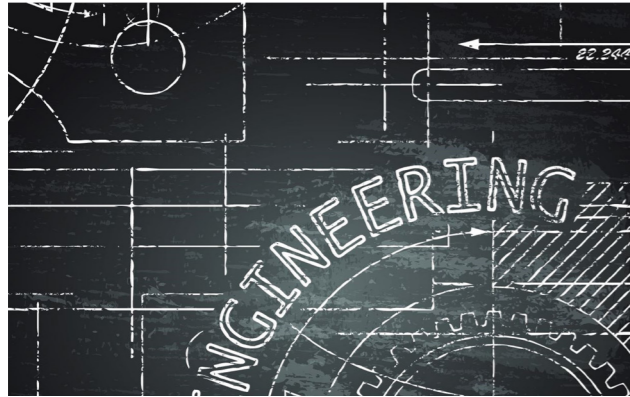


"All the world's a stage." Preparing our graduates for success on a global scale



Great teaching: that indefinable, indescribable but identifiable thing





**Fifteen years with first-year students and still learning**



**Why learning (and teaching) needs to be hard**



**'Flippin' Film Studies: Adaptation and Transformation in the Age of Digital Uplift**



**The dawning era of peer-to-peer education**



**Successful postgraduate supervision? Enhancing HDR students' quality of life**



**Why should student self-management, success and wellbeing be a curricular concern in the HE context?**



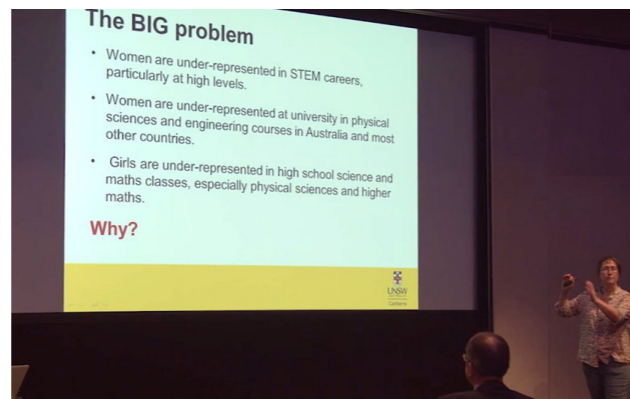
**Building, Gaming and Mentoring: students' learning in construction**



**Law Teacher as Poet: teaching transcendence**



**How do we know what our students know? The benefits of a hurdle-based approach to learning and assessment**



**Why do boys do better than girls on (most) physics tests?**



**Promoting inclusivity through universally designed learning environments**



**Teaching communication skills: students communicating what, to whom, why, and how?**





**Sustainability: the Grand Challenge of our Society and the Role of University Education**



**Visualising Ecologies of Practice: Teaching International Students**

For all lecture recordings from 2017 – 2019, please visit: [unsw.to/sea-lectures](https://unsw.to/sea-lectures)

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