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The Changing Nature of the Academic Role in Science

Final report, 2019

The University of Sydney and Western Sydney University

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List of acronyms and abbreviations used

ARC	Australian Research Council
ATN	Australian Technology Network
ERA	Excellence in Research for Australia (report)
Go8	Group of Eight (universities)
HEA UK	Higher Education Academy of the United Kingdom
IRU	Innovative Research Universities
SFHEA	Senior Fellow of Higher Education Academy of the United Kingdom
science	science, technology, engineering and mathematics
TEF	Teaching Excellence Framework

Glossary

<i>h</i>-index	The maximum value of <i>h</i> such that the given author/journal has published <i>h</i> papers that have each been cited at least <i>h</i> times (Hirsch, 2005)
impact factor	The impact factor of a journal is calculated over two years and is the number of times articles published in a two year period were cited by journals in the year of interest. It measures the importance of a journal by calculating the number of times the articles in the journal have been cited.
Innovative Research Universities	The Innovative Research Universities is a network of seven comprehensive universities committed to inclusive excellence in teaching and research in Australia. Membership includes Charles Darwin University, Flinders University, Griffith University, James Cook University, La Trobe University, Murdoch University and Western Sydney University.

Executive summary

The problem statement

Higher education and academics are under an onslaught of pressures. Key pressures include the rise of performance based funding in both research and teaching, disruptive technologies changing both pedagogy and curricula, and stronger controls regulating quality and standards in a way which was previously thought untenable. Academic roles, which have remained remarkably resilient, are differentiating and the value of an educational academic role not solely focused on disciplinary research is gaining credibility in science disciplines. The lack of differentiation in the academic role is being felt acutely in Science disciplines, where the pervasive emphasis has been on research. Declining enrolments and perceived falling standards of science graduates, both nationally and internationally, raise concerns about the future pipeline of science graduates and a public well disposed towards science. The aim of this fellowship is to reconceptualise the academic role and create a framework to evaluate academic teaching in the sciences.

Goals of the fellowship

The goals of this fellowship program were to:

- reconceptualise the academic role in the sciences, and create a dialogue between academic groups from senior leaders in disciplinary researches and the learning and teaching community to define the current and future shape of an academic role in science
- create an evaluation framework to ensure Australia has excellent academic educators of science in the future.

Outcomes of the fellowship

The key outcomes of this fellowship have been:

- an analysis of the academic role as described in data from the Department of Education and Training, a summary of the description of academic roles as set out in the enterprise bargaining agreements and what is valued as evidence of quality in the education/teaching focused academic role as outlined in promotion criteria and the learning and teaching community
- interviews, insights and understandings on the education/teaching focused role in science from a range of academics across a range of institutions. This included interviews with senior leaders in disciplinary research and the learning and teaching community
- an evaluative framework (professional development framework) and a set of enabling tools to empower education/teaching focused academics to make an impact in their career and more explicitly enable early- to mid-career academics in education/teaching focused roles to evidence their impact and create a career trajectory in science.

Academic roles

We are the midst of a generational change in the academic workforce. Over the past decade, the total academic workforce grew by 6,427 roles, education/teaching focused roles accounted for 48% of this growth, whereas traditional teaching and research roles accounted for only 16.6%, and research focused roles accounted for 35.4% of growth in this period. A new tribe of academic is emerging: the education/teaching focused academic.

Perspectives of academics

Perspectives of academics on the workforce challenges in higher education in science were collected through interviews with 32 academics in education/teaching, teaching and research focused, and research focused academic roles from a range of levels (C–E) in a range of universities. Ten major themes of concerns emerged about the differentiating academic role in science. These were categorised as value, expertise, scholarship, reputation, funding, progress and promotion, research, community and connections, view of students, and metrics and merit. The challenge for an education/teaching focused academic is to retain research currency. To address many of the challenges facing the academic workforce in science, among other solutions a productive partnership between education/teaching focused academics and disciplinary and education researchers was proposed.

Professional development framework for academics

There are a multitude of available promotion policies, frameworks and accrediting bodies that describe criteria and standards to evaluate the teaching component of an academic role. Based on one on one interviews with academics, national interactive workshops with education/teaching focused and teaching and research academics, and a critical analysis of both promotion criteria and a wide diversity of frameworks, a professional development framework containing both standards of quality teaching and enablers was created for education/teaching focused academics and teaching and research focused academics in science in higher education.

The first part of the framework is a set of quality teaching standards, which comprise explicit statements in four main themes – knowledge, practice, scholarship and students – and three subthemes with descriptors.



Standards for quality teaching in an academic role.

The second part of the framework is a set of enabling statements.



Standards

Knowledge

Understand both disciplinary and pedagogical content knowledge. Professional learning in higher education e.g Graduate Certificate in Higher Education, fellowship of Advance HE.

Practice

Capacity to design, deliver and evaluate learning through assessment which is challenging and uses the evidence to change practice; being the reflective practitioner.

Scholarship

Commitment to scholarship and research, the creation of productive partnerships with disciplinary and industry researchers. Access and use of scholarly literature to inform practice.

Students

Capacity to create a contemporary, engaging and safe learning environment for all involved in the learning; students, technicians, peers, colleague and enabling staff such as the library.



Expertise and Research

Universities are places of knowledge creation and expertise. Educational design should be informed by the learning sciences, together with scholarship pertaining to student learning. Education focussed academics need to develop expertise and professional development and training to build expertise in a new educational research paradigm and maintain links to their disciplinary research. This may include strategies which foster productive partnerships with disciplinary and educational researchers.



Student Centered Learning

The safety, well-being and learning of students is the heart of the university enterprise. Education focussed academics must therefore focus on student learning, as well as the creation of a safe and nurturing learning environment. This requires developing a curriculum with opportunities for students to have authentic experiences and to develop work-ready skills.



Connections and Collaboration

Universities are diverse communities where learning is shared as a common interest. Education focussed academics need to create, engage and share educational experiences and practice with their colleagues across the science disciplines, so as to build professional networks internally and externally. This will improve both student learning and educational practice.

Enablers



Communication, Influence and Impact

Communication, both written and oral, is an essential part of academic life. Education focussed academics need to view their role as part of a shared collaborative endeavour to create an "educational ecosystem" where collegiality is valued. They should seek to both mentor and act as mentors for others, including by publishing and communicating practice which influences the perspectives of others.



Personal Effectiveness and Reflective Practice

Effective teachers display personal characteristics such as enthusiasm, integrity, perseverance and resilience. Education focussed academics need to thoughtfully consider their experiences, understand differences in diversity and cultural perspectives of learners, and improve practice through the reflective process.



Innovation and Creativity

Learning in Science is difficult and complex, thus requiring a wide variety of teaching and learning strategies. New technologies are providing opportunities for conceptual understanding and thinking in ways which were previously not possible e.g. mixed and virtual realities. Education focussed academics need to be responsive, open and willing to experiment with new approaches and technologies. They must be prepared to take risks and learn from failure and success alike.

Standards for quality teaching and enablers in an academic role (icons by Maria Zamchy).

Used together these standards form a professional development framework: an explicit set of statements of quality teaching standards and an explicit set of enabling statements to act as signposts on the teaching journey from novice to expert academic in an education/teaching focused role.

The new professional development framework attempts to overcome the shortcomings of the current promotion policies and teaching criteria and standards frameworks. It attempts to avoid the simplistic notion of a standard that can be used by academics to 'tick the box', the lack of creativity which can emerge with standardisation, the over-reliance on student satisfaction data, the use of educational quality based on inspiration and charisma, and award statements which can rely on adjectives over data, and which crosses education and global boundaries.

The education/teaching focused role is considered one of the 'wicked problems' facing higher education (Adams Becker, 2017). For academics in science, an education focused role brings the significant challenge of a new research paradigm and development of a new set of skills. An education/teaching focused academic in science needs to build their expertise, and in an education context start again as a novice, making the journey to an expert in a new disciplinary home, one which has a focus on the student and excellence in education in science.

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Chapter 1 Project context

Higher education and academics are under an onslaught of pressures. Key pressures include the rise of performance based funding in both research and teaching, disruptive technologies changing both pedagogy and curricula, and stronger controls regulating quality and standards in a way which was previously thought untenable (Coates and Goedegebuure, 2012). Academics appointed because of research track record are becoming increasingly less relevant in this reconfiguring higher education context. Increased demands on academic time have seen a much smaller proportion of academics finding the time to do original research and writing (James et al., 2013). Even those academics aspiring to a research career now spend most of their time doing teaching (Coates, 2009a,b).

It is reasonable to contend that the current conceptualisation of the academic role and career structure based on research no longer meets the operational needs of the current higher education environment. The academic role, which has been remarkably stretchable, needs to change and differentiate (Coates and Goedegebuure, 2012).

Although various projects have been launched in an attempt to redefine the changing academic role (James et al., 2013), most of these dichotomise the academic career into either research or teaching (Probert, 2013, 2015). Some studies have found there is no correlation between teaching and research (Hattie and Marsh, 1996); academics who are excellent researchers are not necessarily excellent educators and vice-versa. Hattie and Marsh (2004), in a meta-analysis, found that competencies required to excel in teaching do not necessarily coincide with research. Departments which excel in research do not have better student experiences, and those which do more poorly in research metrics do not have better student experiences. Better researchers are not necessarily better teachers (Norton et al., 2013). To excel in all aspects of an academic role may not even be possible (Bexley et al., 2011).

Coates and Goedegebuure (2012) published a framework where academics could 'differentiate' their career at various times in their academic progression emphasising the type, rather than just the level of academic work, depending on:

- academic career choices at a particular moment of time
- academic strengths and experiences
- the needs of the university in filling a diversity of academic roles.

Such differentiation allows academics to structure more freely their careers, allowing conceptions of academic roles which move flexibly between research, teaching and administration appointments and take trajectories similar to 'snakes and ladders' rather than the current linear career progression. The lack of differentiation in the academic role and expertise in the education/teaching focused role is being felt acutely by the science, disciplines where the pervasive emphasis has been on research (Anderson et al., 2011).

Declining enrolments and perceived falling standards of science graduates, both nationally and internationally, raise concerns about the future pipeline of science graduates and a public who are well disposed towards science (Ainley et al., 2008; Kennedy et al., 2014; Organisation for Economic Co-operation and Development, 2006). Even leading science journals are questioning the culture of the academy in science that dichotomises research from teaching and devalues education. In the journal *Nature*, Anderson et al. (2011) present the troubling reality of the ambivalence of science researchers who eschew teaching in favour of research, but personally value teaching, asking

Do we, the world of science, care equally about education and research?

In the same journal, Savkar and Lokere (2010) ask

How do we help transform our research universities so that the teaching of science and scientific research are seen more broadly as equally valuable and mutually reinforcing?

Both emphasise university cultures which do not adequately support, value or reward academics who are excellent teachers. Each journal calls for profound change from a well established culture which rewards research over teaching, stating research and teaching need no longer be in competition, but should be mutually beneficial activities, generating new knowledge and educating our students. Nobel scientists, Wieman and Schmidt, agree that to solve global issues we need high quality science education and excellent science teachers at all levels (Chubb, 2012; Obama, 2013; Schmidt, 2012; Wieman, 2007; Wieman et al., 2010).

While Coates and Goedegebuure (2012) provide a perspective that the structuring of an academic career is a process of ordering, there are other perspectives. From a management perspective the puzzle involves juggling a whole series of interconnected 'academic roles' to ensure the maximum outcome for the school and institution. Management also need to know how to evaluate effectively various aspects of the academic role. Whereas the evaluation of research is well established with journal rankings and grant successes, the evaluation of teaching is less established. The reliance on student surveys, student evaluations of teaching and deference to teaching awards and prizes has been seen as a narrow framework on which to assess teaching quality. Recent triggers created by the Academic Workforce 2020 (James et al., 2013) and frameworks such as the [Australian University Teaching and Criteria and Standards Framework](#) (Chalmers, 2011) and the United Kingdom [Professional Standards Framework Higher Education](#) (Higher Education Academy, 2011), now Advance HE, for teaching and supporting learning in higher education, although providing a framework for evaluating teaching, are complex and fall short of evaluating the holistic academic. From a disciplinary science perspective, differentiation in academic role rather than movement between the research and education/teaching focused academic roles is more realistic. Once an academic moves out of disciplinary research, the likelihood of research funding and the

maintenance of a substantial track record is less, especially in the current environment of increased competitiveness for a declining funding pool. There is also a value perspective once a science academic moves out of research. Many science academics' interest and reason for being an academic is to complete disciplinary research. Prestige, status and identity drive academics in science to focus and value specific activities, such as research. Accountability to peers and professional autonomy are part of this mix (Ramsden, 1998) and these values govern academic work (Becher and Trowler, 2001). Even at scientific professional meetings, researchers rarely attend education sessions. Education sessions are often not well integrated into the research proceedings, being scheduled at times which make attendance difficult. The lack of attendance and integration at conferences reinforces the concept that education is not valued and is separate to their main purpose (Brownell and Tanner, 2012; Mervis, 2013).

While we have metrics which evaluate research in terms of journal rankings and grant successes, and criteria and standards which separately evaluate teaching, we have limited metrics which holistically evaluate the academic role in the sciences and build the flexibility we need for the future. New metrics to evaluate teaching, however comprehensive, may be of limited value, without an understanding of how academics in science disciplines are judged. Part of this report creates a metric which holistically represents value of the academic role in the sciences, whether education/teaching or a combination of both teaching and research.

Education frameworks to evaluate the academic role

A multitude of available frameworks evaluate the teaching component of an academic role. For example, the [Australian University Teaching and Criteria and Standards Framework](#) (Chalmers, 2011) was designed to provide academics with a practical guide describing quality teaching and how it can be evidenced, and the [Queensland University of Technology \(QUT\) evaluative framework 'Reframe'](#) provides academics with a reflective tool to design, deliver and evaluate learning experiences. Meanwhile, the United Kingdom [Professional Standards Framework Higher Education](#) from the Higher Education Academy (2012) (HEA UK, now Advance HE) is an internationally recognised framework which aims to raising the profile of learning and teaching in higher education. It represents standards against which academics can describe their professional practice, so as to pursue fellowships at various levels. The Teaching Excellence Framework, which has received recent global attention, reflects government attempts to assess the quality of undergraduate teaching, which includes three components: teaching quality (including student satisfaction), the institutional environment in which students learn, and student outcomes. Finally, the [Vitae Researcher Development Framework](#) (Vitae, 2010) allows researchers to describe the knowledge, behaviour and attributes that they need to be successful. This multitude of frameworks suggests an according multiplicity of possible solutions.

In developing a new and useful framework, it is important to consider what should not be in the framework. First, a framework should not be a simplistic notion. There is no advantage to creating a framework which is merely used by academics to 'tick the box' and climb through promotion levels in the belief that they have reached a quality standard in teaching. Teaching is a complex and emergent process, with the sum being greater than the individual components. It would be wrongful epistemology to view quality teaching as a check list or a fixed set of credentials. Unfortunately, a framework engenders this by presupposing that one size fits all. Although a framework can set teaching standards, standardisation has the innate potential to lead to lack of creativity and poor quality. Moreover, the overall reliance on student satisfaction data in a framework is perhaps one of the most controversial measures of teaching quality.

Designed and used for the first time in the 1920s, student surveys of teaching are today used by almost all universities around the world, generally at the end of the semester, prior to exams, where students are asked to rate a unit or academic on both an overall basis and using specific criteria related to assessment, feedback and contribution to student learning (Uttl et al., 2017). The controversial aspect of this is the data's potential use to performance manage academic staff and equate it to teaching effectiveness and student learnings, rather than as a valuable personal feedback tool. Reviews and metanalyses indicate that students do not necessarily learn more from academics with higher student satisfaction in surveys (Uttl et al., 2017), and some have bluntly stated that student satisfaction as a measure of academic performance needs to be 'killed off'. However, there is also widespread belief in the view that the qualitative comments in student unit evaluations have meaning and create a mechanism to close the loop on student views on the effectiveness of strategies used for student learning. Similarly to student satisfaction, the use of awards and prizes as an indicator of quality standards and as a recognition of teaching quality has the potential to undermine teaching quality, especially if the practice of the awardee is seen by their peers as undeserving. The creation of an award statement is an art within itself, and in the absence of data on student learning gain there is a reliance on adjectives over data; words are free, can be misleading and create a reality which may not exist. Teaching is not a competition, and yet awards signal that it is at least partly a competitive process. Additionally, a preoccupation with the inspirational and charismatic nature of a teacher does not necessarily equate with student learning and performance. Finally, there is much to be learnt about professional standards by crossing the boundaries between secondary and tertiary education, as well as between Australia and the global higher education market. A restricted focus on both our boutique island system and tertiary level is only likely to create a narrower set of standards and a constrained framework.

If a series of criteria, such as those used in promotion policies, that can be ticked off is problematic and so too is a lengthy series of criteria and standards which are too complex to use, then perhaps a simpler but broader purpose tool with a mechanism for enabling education/teaching focused academics to navigate the journey of teaching is the solution. As

James et al. (2015) states, a professional evaluation tool which measures the quality and standards of teaching and learning is valuable in a more 'diverse, complex and competitive tertiary environment'.

To create a professional evaluative framework in this study, containing both standards and a mechanism for education/teaching focused academics to navigate the teaching journey, a mixed methodology was used. Initially, the existing teaching frameworks and criteria described in promotion policies for academics were accessed, and the frequency of the common criteria summed. Second, the frequency of responses by academics to questions regarding evidence of quality teaching was tallied. Finally, the challenges and enablers in the education/teaching focused academic role, as highlighted in interviews, were summarised.

Chapter 2 Project approach

Academic roles

To determine the number and proportion of academics in teaching/education, teaching and research only and research only academic roles, the classifications of full-time academic staff and their roles were tallied using the higher education data from the Department of Education and Training Document Library (Department of Education and Training, 2017).

The Department of Education classifies ‘teaching-only’ roles as work that

... involves only teaching and associated activities (including lecturing, group or individual tutoring, preparation of teaching materials, supervision of students, marking, and preparation for the foregoing activities), or the management and leadership of teaching staff and of staff who support teaching staff. There is no formal requirement that research be undertaken’

‘Research only’ roles involve

work undertaking only research work or providing technical or professional research assistance, or the management and leadership of research staff and of staff who support research staff. There may be limited other work (eg participation in the development of postgraduate courses and supervision of postgraduate students).

In ‘teaching and research’ roles

both a teaching function and a research function will be undertaken, or the work requires the management and leadership of teaching staff and research staff and persons who support such staff.

Small teaching colleges with less than 60 academic staff were not included. The proportion of academics in each category of education/teaching focused, teaching and research focused, and research focused academics were calculated for each university.

Enterprise bargaining agreements

To determine the percentage of allocation of academic work into various tasks publicly available enterprise bargaining agreements were analysed. The agreements were accessed through the National Tertiary Education Union website. Thirty-eight enterprise bargaining agreements were accessed for Australian universities; the agreements for three private universities could not be accessed publicly (Table 1).

Table 1. Universities whose enterprise bargaining agreements were analysed as part of this report

Name of university	URL
Australian National University	www.nteu.org.au/library/download/id/8628
The University of Melbourne	www.nteu.org.au/library/download/id/9535
The University of Sydney	www.nteu.org.au/library/download/id/8705
University of New South Wales	www.nteu.org.au/library/download/id/9567
The University of Queensland	www.nteu.org.au/library/download/id/9488
Monash University	www.nteu.org.au/library/download/id/5638
The University of Western Australia	www.nteu.org.au/library/download/id/8393
The University of Adelaide	www.nteu.org.au/library/download/id/8556
University of Technology Sydney	www.nteu.org.au/library/download/id/9391
University of Newcastle	www.nteu.org.au/library/download/id/9512
University of Wollongong	www.nteu.org.au/library/download/id/6515
Queensland University of Technology	www.nteu.org.au/library/download/id/5571
Macquarie University	www.nteu.org.au/library/download/id/9226
Curtin University	www.nteu.org.au/library/download/id/8891
RMIT University	www.nteu.org.au/library/download/id/9309
University of South Australia	www.nteu.org.au/library/download/id/5287
University of Tasmania	www.nteu.org.au/library/download/id/9389
Deakin University	www.nteu.org.au/library/download/id/7994
Griffith University	www.nteu.org.au/library/download/id/9154
James Cook University	www.nteu.org.au/library/download/id/8611
Swinburne University of Technology	https://www.swinburne.edu.au/media/swinburneeduau/about-swinburne/hr/AG_EA_2017.pdf
La Trobe University	www.nteu.org.au/library/download/id/8493
Flinders University	www.nteu.org.au/library/download/id/5860
Western Sydney University	www.nteu.org.au/library/download/id/8735
Murdoch University	www.nteu.org.au/library/download/id/8996
Central Queensland University	www.nteu.org.au/library/download/id/3485
University of Canberra	www.nteu.org.au/library/download/id/6774
Charles Darwin University	www.nteu.org.au/library/download/id/9507
Victoria University	www.nteu.org.au/library/download/id/4686
Edith Cowan University	www.nteu.org.au/library/download/id/8532
University of Southern Queensland	www.nteu.org.au/library/download/id/9550
Australian Catholic University	www.nteu.org.au/library/download/id/9376
Southern Cross University	www.nteu.org.au/library/download/id/7558
University of New England	https://www.nteu.org.au/library/download/id/5658
University of the Sunshine Coast	www.nteu.org.au/library/download/id/7110
Charles Sturt University	http://www.csu.edu.au/data/assets/pdf_file/0008/149831/enterprise-agreement.pdf
Notre Dame University	www.nteu.org.au/library/download/id/7660
Federation University of Australia	https://federation.edu.au/data/assets/pdf_file/0011/277787/Federation-University-Australia-UCA-2015-2018.pdf

Interviews with academics

To determine and reconceptualise the education/teaching component of the academic role in science, a series of interviews were held with 32 academics in junior and senior leadership roles in higher education. Of these, 11 were males and 21 were females (34:66 male to female ratio). These academics were education/teaching focused academics, teaching and research academics, research focused academics, pro vice-chancellors (education), deputy vice-chancellors (education), vice-chancellors and an education consultant. The range of academic roles and levels of academics interviewed are detailed (Tables 2 and 3). Overall there were nine education/teaching focused academics, 11 teaching and research focused academics, two deputy vice-chancellors, one pro vice-chancellor and one vice-chancellor. All academics were from a range of disciplines and included biology, chemistry, life sciences, mathematics physics and psychology. These academics ranged in level from mid-career academic (level C) to experienced academic (vice-chancellor) and included four senior lecturers (level C), nine associate professors (level D) and 11 professors (level E) from seven institutions and five Group of Eight (Go8) institutions, including The University of Queensland, where education/teaching focused academic positions were first introduced in 2006, followed by Monash University in 2009. The gender split of interviews was 34% male and 66% female, the greater proportion of females perhaps reflecting the gender skewed ratio in education/teaching focused academics. These academics were readily identifiable using the Office for Learning and Teaching established discipline networks across the science disciplines which include the Vision and Innovation in Biology Education Network, Collaborative Universities in Biomedical Education Network, Chemistry Discipline Network, Physics Discipline Network and the Australian Mathematical Sciences Learning and Teaching Network.

Table 2. Australian universities, university groups, academic levels and roles interviewed

University groups	Group of Eight (Go8) universities, Innovative Research Universities (IRU), Australian Technology Network (ATN)
Participating universities	Australian National University (Go8), Monash University (Go8), University of Sydney (Go8), University of Queensland (Go8), University of New South Wales (Go8), University of Melbourne (Go8), Flinders University (IRU), University of Technology Sydney (ATN), Western Sydney University, University of Tasmania
Academic levels	C, D, E
Roles	Vice-chancellor, deputy vice-chancellor, pro vice-chancellor, head strategic research initiatives, dean of science, dean of education, deputy head of school and director of teaching, education focused academic, teaching and research academic, private education consultants

A series of 15 questions were used to create a scaffold in semi-structured interviews (Appendix B, Table 1), which lasted 30–60 minutes and were recorded. Following recording, interviews were transcribed by [Pacific Transcription](#). Ideas were identified using thematic analysis by two independent researchers who sought to surface the underlying patterns and ideas. Research ethics approval was applied for using the National Ethics Application Form process (now replaced by the Human Research Ethics Application) and assessed by the Human Research Ethics Committee at Western Sydney University, approval number H11177.

Table 3. Classification, level and gender of interviewees from 10 participating universities

Interviewee number	Name of institution	Classification of university	Level of academic	Gender
1	The Australian National University	Go8	E	M
2	Monash University	Go8	D	F
3	University of Tasmania	N/A	C	F
4	Office of the Chief Scientist	N/A	N/A	F
5	University of Melbourne	Go8	D	F
6	Western Sydney University	IRU	E	M
7	University of Technology Sydney	ATN	E	M
8	The University of Queensland	Go8	D	F
9	The University of Sydney	Go8	E	F
10	The University of Queensland	Go8	D	F
11	The Australian National University	Go8	E	M
12	University of New South Wales	Go8	D	F
13	The University of Queensland	Go8	C	F
14	The Australian National University	Go8	E	F
15	The Australian National University	Go8	E	M
16	Flinders University	IRU	E	F
17	The Australian National University	Go8	D	F
18	The Australian National University	Go8	E	F
19	The University of Queensland	Go8	D	F
20	Monash University	Go8	E	F

21	Monash University	Go8	D	M
22	The University of Queensland	Go8	C	F
23	The University of Queensland	Go8	D	F
24	The University of Sydney	Go8	E	F
25	The University of Queensland	Go8	C	M
26	University of Technology Sydney	ATN	C	F
27	Monash University	Go8	D	M
28	The University of Sydney	Go8	E	M
29	University of New South Wales	Go8	D	M
30	Private organisation	N/A	N/A	F
31	University of Technology Sydney	ATN	E	M
32	The University of Sydney	Go8	D	F

Promotion policies

To determine what is valued in the academic role, criteria in promotion policies for education/teaching focused, teaching and research academics and research focused academics were analysed. The promotion criteria were accessed through the website of 28 Australian universities including all Go8 universities (Appendix B, Table 2). All universities without publicly available promotion criteria were contacted by email and given the opportunity to send their criteria. Promotion criteria expectedly divided expectations into consistent academic roles such as education/teaching focused, teaching and research focused, and research focused academic roles. Expectedly there were inconsistencies among universities in the criteria used to characterise these roles. To create a holistic picture of promotion criteria, common descriptions of criteria were summarised across universities. The number of times the criterion appeared in promotion policies for each academic role was tallied.

Workshops

To determine what education/teaching focused academics viewed as evidence of quality teaching, workshops were held with academic staff in four states (New South Wales, Queensland, South Australia and Victoria). There were four workshops and a total of 295 participants (Table 4). The academics who attended these workshops were senior leaders in teaching and learning from a range of institutions including universities, the Office of the Chief Scientist and the Australian Council of Deans of Science. In addition, there were 17 interactive presentations which articulated the findings of these workshops and interviews. Overall, there were at least 960 academics involved in the 17 workshops and presentations (Appendix B, Table 3). These workshops brought together regional early- to mid-career academic staff using the Office for Learning and Teaching established discipline networks across the science disciplines which include Vision and Innovation in Biology Education, Collaborative Universities in Biomedical Education Network, Chemistry Discipline Network, Physics Discipline Network and the Australian Mathematical Sciences Learning and Teaching Network.

Table 4. Details of workshops where evidence of quality teaching was collected

Workshop	Date	Location	Workshop themes	Number of participants
Australian Council of Deans of Science. First Year in Science and Mathematics	5 February 2016	University of Sydney, Sydney	Academic roles, management and leadership. Changing academic roles, management and leadership	58
Australian Council of Deans of Science. First Year in Science and Mathematics	2 February 2016	University of Melbourne	Academic roles, management and leadership. Changing academic roles, management and leadership	41
Seminar workshop	23 February 2016	University of New South Wales, Sydney	Changing nature of the academic role	~25
Australian Conference on Science and Mathematics Education	4 October 2016	University of Queensland	'Professional stripping': the education focused academic role in the sciences	171
Total				295

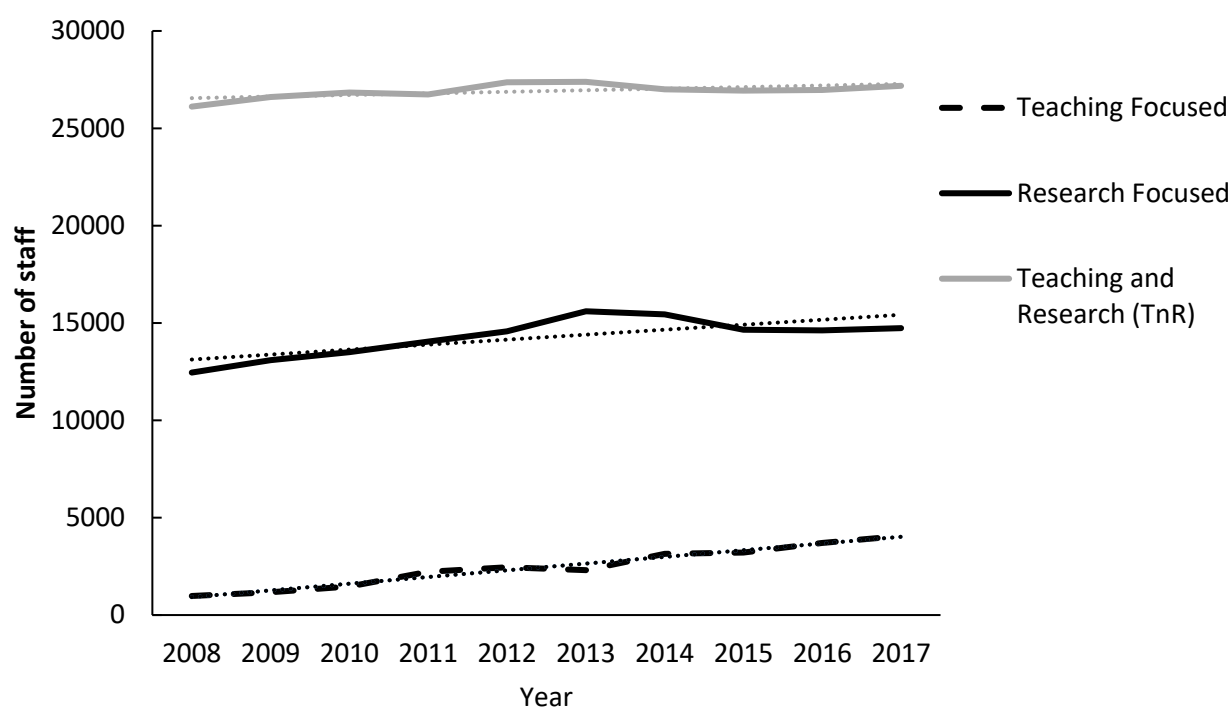
At these workshops, participants were asked three main questions about how to evaluate quality in teaching and what evidence is used to measure quality in the education/teaching component of the academic role: What metrics should we use to assess quality of teaching? What criteria should we use to measure teaching quality? What evidence should we use to measure teaching quality? Participants wrote down the responses to these questions. These were then theme coded and tallied.

Chapter 3 Project outputs and findings

Academic roles

While most universities have the capacity to academics into education/teaching focused roles, these roles are still the minority in Australian universities (Figure 1). In 2017, there were a total of 45,975 full-time academic staff employed at Australian universities, most academic staff are employed in traditional teaching and research roles (Figure 1; [Department of Education and Training](#), 2017). There were 27,181 full-time staff employed in Australia as teaching and research academics which comprised 59.2% of the total academic workforce. There were 4061 employees in education/teaching focused roles which comprised 8.8% of the total academic workforce, and there were 14,733 research focused academic staff which comprised 32% of the academic workforce. Despite this current difference, the rate of change in the number of employees in academic roles is drastically different. The number of employees in teaching focused roles grew 314% between 2008 and 2017, whereas the number of staff in teaching and research roles grew 4% in this same period (Figure 2). The total academic workforce grew by 6,427 roles between 2008 and 2017. Teaching focused roles accounted for 48% of this growth, whereas traditional teaching and research roles accounted for only 16.6% of this growth. Some universities such as Charles Sturt University have committed to an overall cap on the number of teaching focused roles; 'the number of teaching focused academic staff will be limited to 15% of the total equivalent academic full-time staff of the University' (Charles Sturt University enterprise bargaining agreement, p. 22).

a



b

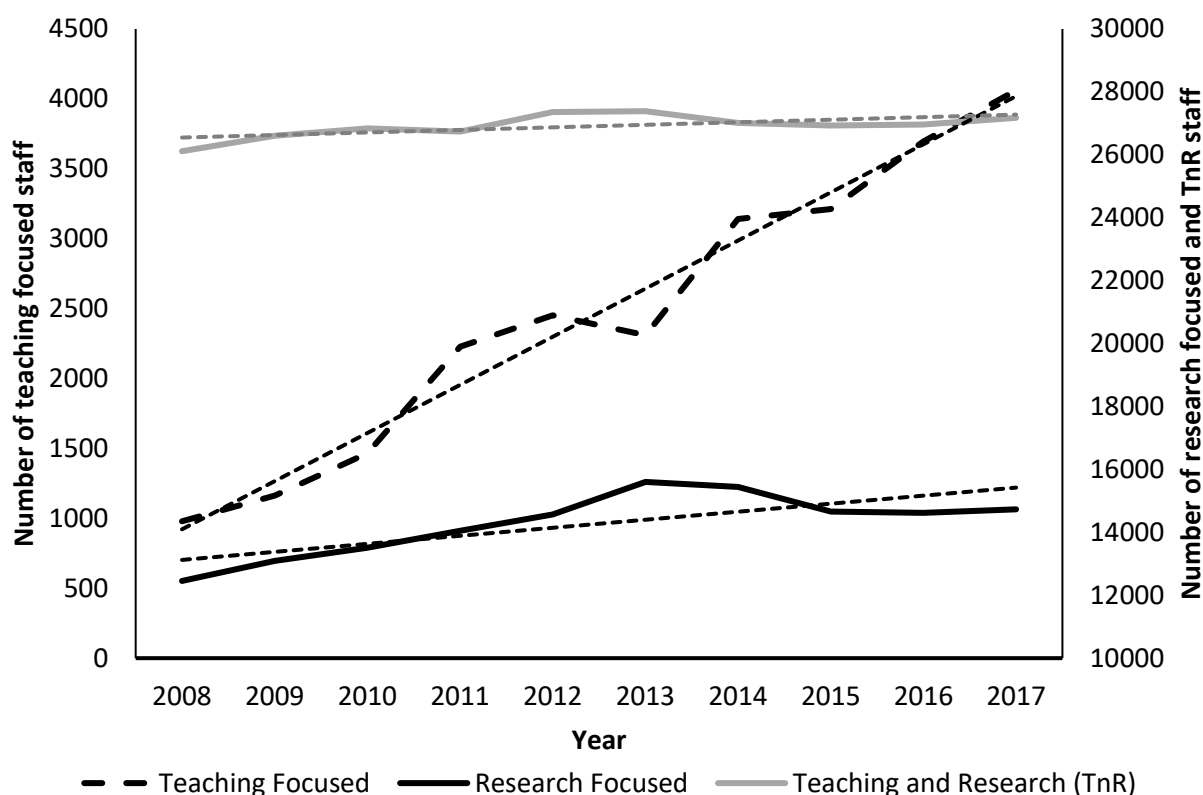


Figure 1. (a) Number of staff employed in different roles at Australian universities (teaching focused, research focused, teaching and research from 2008 to 2017; Department of Education and Training, 2017). **(b)** Number of staff employed in different roles at Australian

universities (teaching focused, research focused, teaching and research) from 2008 to 2017 (Department of Education and Training, 2017) with number of teaching staff plotted on a second axis.

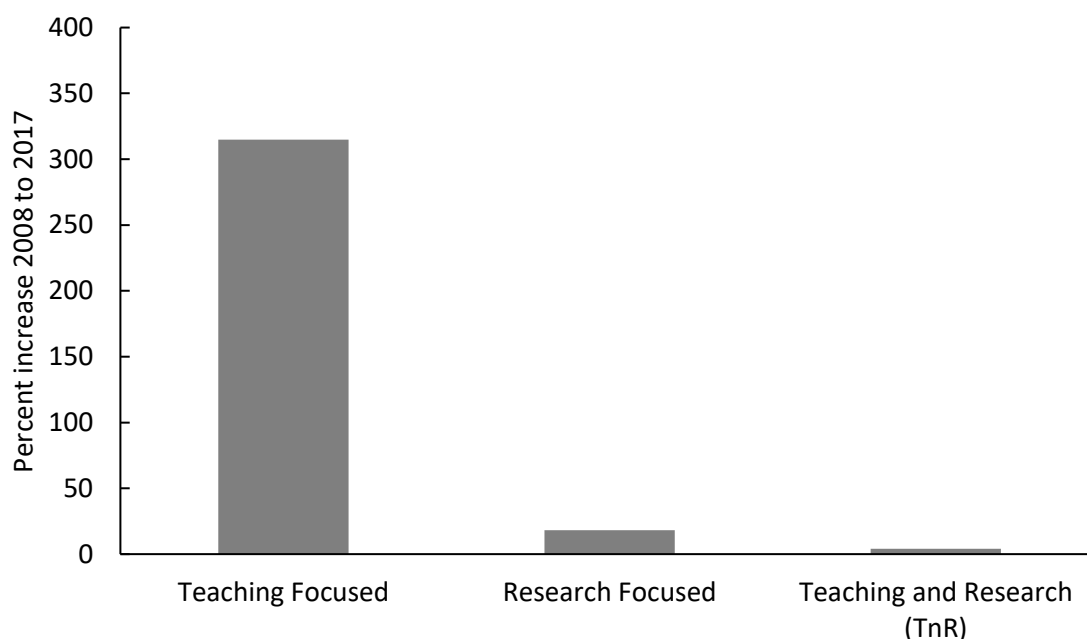


Figure 2. Percentage increase in the number of academic staff at Australian universities in different roles between 2008 to 2017 (Department of Education and Training, 2017).

The Go8 universities had the lowest relative proportion of their full-time staff employed in education/teaching focused roles (overall 4.4% of total academic workforce) with the largest proportion of staff employed in research focused roles (overall 43% of total academic workforce) (Figure 3; Department of Education and Training, 2017). When Go8 universities were compared to other institutions they had the least relative proportion of their staff employed in teaching and research roles and teaching-only roles (Figure 3). The University of Queensland had the greatest proportion of staff employed in research only roles, with these academics comprising 60% of their total workforce (Figure 4). The Australian Catholic University had the greatest proportion of staff in teaching focused roles, with these staff constituting 45.7% of their workforce. Of the Go8 universities, The University of Melbourne had the greatest relative proportion of staff employed in teaching focused roles, with 10.5% of staff employed in these roles. The Go8 universities had half the number of teaching focused staff compared to the ATN universities, which had the second lowest percentage of teaching focused staff. The ‘not affiliated’ universities had the greatest mean proportion of staff employed in teaching focused roles. When the proportion of academic staff education/teaching focused roles was compared across the Go8 universities. The proportion of education/teaching focused staff ranged from zero at The Australian National University to less than 5% of the total academic workforce at University of New South Wales and The University of Queensland, and was greatest at The University of Melbourne.

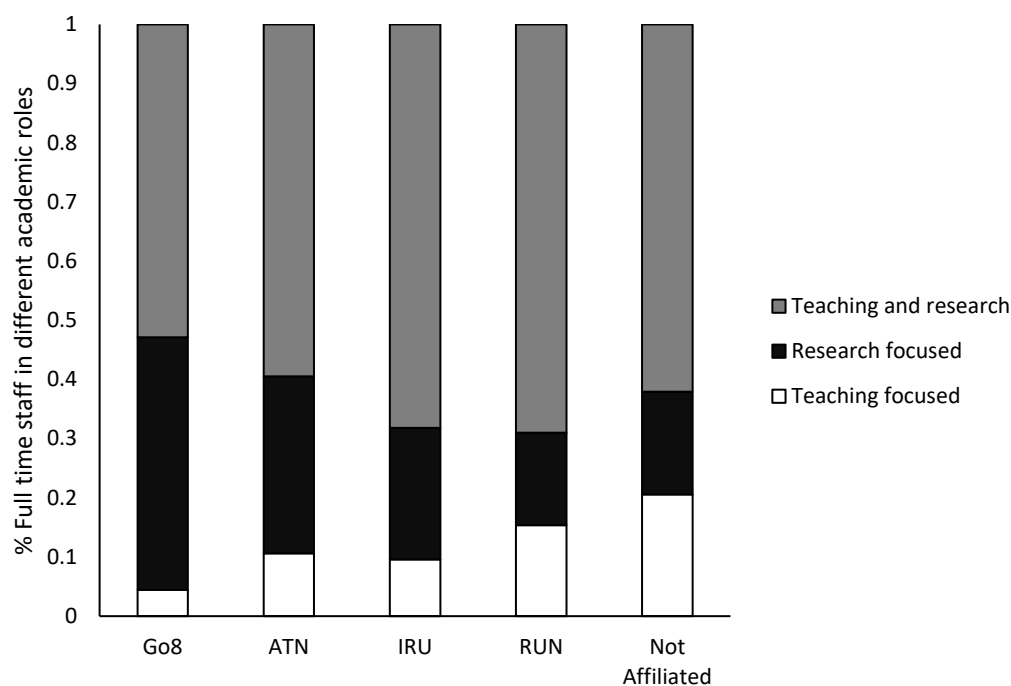


Figure 3. Mean percentage of full-time staff in teaching focused, research focused, and teaching and research focused roles. Universities are arranged by university groupings, $n=43$ universities (Department of Education and Training, 2017).

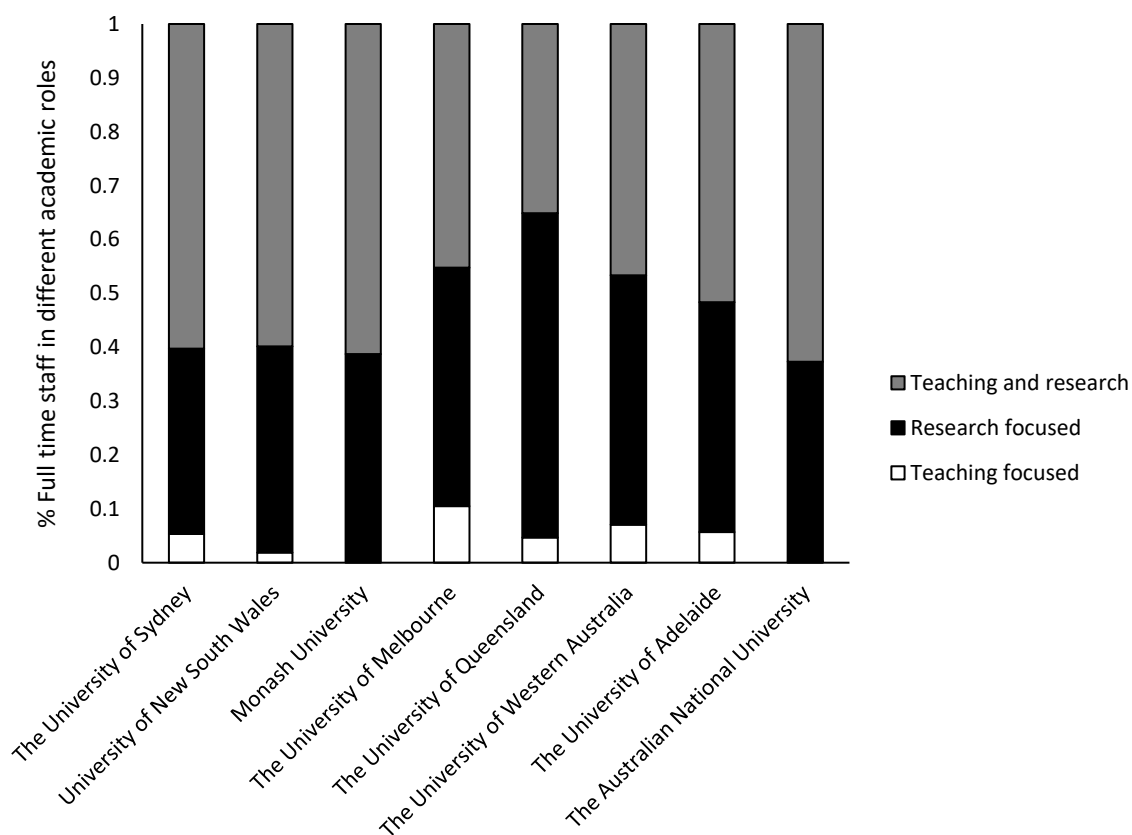


Figure 4. Mean percentage of full-time staff in teaching focused, research focused, and teaching and research focused roles at Go8 universities, $n=8$ universities (Department of Education and Training, 2017).

Enterprise bargaining agreements

Almost all universities in Australia can employ staff to focus on education/teaching. This can be done on either a temporary basis in the case of scholarly teaching fellows, or on a permanent basis in the case of education/teaching focused academics (Table 5). In most cases, the enterprise bargaining agreement allows for academic workloads to exist on a variable basis, where supervisors can negotiate the teaching load of academics. The variable model is used by 15 institutions and is currently the most common among Australian universities (Table 5). In some cases, the variable workload must be within boundaries. For example, at the University of Adelaide, a teaching and research academic can be assigned a research load that occupies 20–60% of their time. In some cases, a minimum or maximum number of face to face teaching hours are used instead of percentage of time to limit the allocation of a teaching workload (Table 5; see James Cook University). Almost all universities recognise that there is not a ‘one size fits all’ approach to academic workloads and, as stated in The University of Melbourne academic career benchmarks, ‘individual careers and achievements are framed holistically on relevant indicators taking into account the priorities of faculties and graduate schools and the expectations for specific academic roles’. The variable model of allocating workloads allows universities to fill needs on a case by case basis and address current shortcomings in their workforce. For those universities that specify a workload split, the 40:40:20 model for teaching and research staff is still the most common and is currently adopted by eight institutions (University of Sydney, Monash University, University of Technology Sydney, Macquarie University, University of South Australia, University of Tasmania, Griffith University, University of Sunshine Coast; Table 5). For education/teaching focused academics, there is less consistency among universities for their workload split. The most common percentage of time spent working on teaching and education is 70–80%.

Table 5. Summary of academic workload enterprise bargaining agreements for Australian universities showing the percentage split among the three generic categories of academic work: research, teaching/education and other (usually including service to the university or community). Universities are arranged in order of rank according to 2017 QS (Quacquarelli Symonds) rankings. Where hours are specified, it is the maximum face to face teaching hours an academic can perform in a year. Scholarly teaching fellow refers to whether the university can hire a teaching fellow on a fixed term basis to spend >75% of their time focused on teaching.

Institution	Teaching and research			Teaching/education focused positions			Research focused			Scholarly teaching fellow (fixed term)
	Research	Teaching	Other	Research	Teaching	Other	Research	Teaching	Other	
The Australian National University	Variable [†]									
The University of Melbourne	Variable [†]									Y
The University of Sydney	40	40	20	10	80	10	80	10	10	Y
University of New South Wales	Variable [†]									
The University of Queensland	Variable [†]									
Monash University	40	40	20	Yes – on negotiation						Y
The University of Western Australia	Variable [†]									
The University of Adelaide	20–60	20–60	10–40	40–45	60–90	40–42	90–60	40–45	40–42	Y
University of Technology Sydney	40	40	20							Y
University of Newcastle	Variable [†]									Y
University of Wollongong	Variable [†]									
Queensland University of Technology	Variable [†]									
Macquarie University	40	40	20	0	70	30				
Curtin University	20–50	30–60	20		50–70	30–60	50–70	10–30	20	Y
RMIT University	>30	>30	>30							
University of South Australia	40	40	20	0	80	20				
University of Tasmania	40	40	20	20	60	20	60	20	20	Y
Deakin University	Variable [†]									

Institution	Teaching and research			Teaching/education focused positions			Research focused			Scholarly teaching fellow (fixed term)
Griffith University	40	40	20		>70	<30				
James Cook University	20–60	<50	20	10–20	<75 (500 hours)	<20	30–60	<40 (260 hours)	<20	
Swinburne University of Technology	Variable [†]				<65					
La Trobe University	20–70	20–70	10							Y
Flinders University	Variable [†]									
Western Sydney University	Variable [†]									
Murdoch University	Variable [†]									
Central Queensland University	35	55	10	15	75	10	60	30	10	Y
University of Canberra		288 hours			578 hours					
Charles Darwin University		40	60		>40	<60		20	80	
Victoria University	Variable [†]	336 hours								Y
Edith Cowan University	20–60	20–60	10–20	50–80	10–20	10–50	60–90	0–20	10–20	
University of Southern Queensland	10–80	10–80	10–40	0–80	10–90	10–40	10–90	0–80	10–40	
Australian Catholic University		336 hours			480 hours			168		
Southern Cross University	30	60	10	20	70	10	90	0	10	
University of New England				0	57	43				
University of Sunshine Coast	40	40	20	20	60	20	60	20	20	Y
Charles Sturt University	60	30	10	0	80	20				Y
Notre Dame University	Variable [†]									
Federation University Australia		10–70								

[†] Workload split is negotiated on an individual basis.

Interviews with academics

Ten major themes emerged from interviews with academics. These can be summarised as:

- value
- expertise
- scholarship
- reputation
- funding
- progress and promotion
- research
- community and connections
- view of students
- metrics and merit.

Value

It is clear that the dichotomy and value in the academic role are well understood by the academic community. Interviewees clearly outlined three or more categories of academics. These are research academics, who are highly valued and whose role is to create new knowledge in science disciplinary research; teaching and research focused academics, who are valued if they are engaged and successful at disciplinary research (if doing educational research they are considered of lesser value); and education/teaching focused academics, who are often seen as 'failed researchers'.

Interviewees discussed the mixed perceptions held about education/teaching focused academics and described experiences which sent contradictory messages about these academics to the academic community both institutionally and across the country.

Interviewees often described the difference between an official view and the 'real' view in the status of an education/teaching focused academic.

I can give you a view of what we officially, you know, that we think teaching and research are equally important and there's no point of producing new knowledge unless you share it and that bright young people have part of that in terms of production and new knowledge and a focus on research-led education is a way to link the two.

Interviewee 1, Level E, Go8

So I think if you're going to have those positions they have to have equivalent status. That's probably never going to happen. They should be set up at least to look like they have equivalent status.

Interviewee 14, Level E, Go8

One staff member had won a ALTC [Australian Learning and Teaching Council] teaching award, so a teaching award on a national level in her discipline and she was made redundant.

Interviewee 2, Level D, Go8

It is clear that in almost all universities across Australia, academics who are successful in research are still more highly valued than academics focused on education, even at the most senior levels. Some universities have opened up the possibility for academics to transfer into an education focused role, for academics committed to and succeeding in good teaching practice. However, in some Australian universities these positions are for non-performing or failed researchers. Despite institutional talk about parity of esteem for education/teaching focused academics, the view exists that research is still to be more highly valued. Although the rhetoric at some universities suggests that teaching is valued, the hidden messages suggest that it is less valued than would be overtly expressed. When academics were directly asked 'Do you think that the education aspect is valued equally with research?', their general reply was

The short answer would be no.

Interviewee 3, Level C, no group

It is clear that disciplinary research *is* given funding priority over education and/or teaching. It is less well known within universities that teaching income subsidises research costs because research grant funds do not cover all associated costs of research, and this is not widely recognised. Some interviewees believe that disciplinary research *should be* given funding priority: resources allocated to teaching may be seen as a dilution of funds available for disciplinary research.

Their work is ending up giving – the money that they bring in for – the university brings in for the students is given to the researchers.

Interviewee 4, not university affiliated

I actually have a hope that it will twig eventually that students are where the money is and that research grants actually don't fund academics. They fund a couple for a short period of time, until you get the next research grant, but actually are not where the money is.

Interviewee 3, Level C, no group

Despite the seemingly pervasive bias towards research, some universities are beginning to value and support education/teaching focused academics, and to see the role as something other than a dumping ground for non-performing academics.

The thing that's really also happened is that for the first time promotions have actually seriously addressed teaching. So some people who are very good at research – had amazing research outputs – were told it is not enough to just submit the student survey evaluation scores as it – and they say that they're okay. That does not work if you are wanting to be a level C or D or E ... So I think, in that sense, in the university, there is a sense of the role is changing. We're now expected to do things in terms of teaching.

Interviewee 3, Level C, no group

So once I was in that teaching focused role that's when I started saying well okay I can go to teaching and learning conferences more, I can think about writing a paper and what I'm doing, I can apply for a teaching and learning grant. Because now it means something to my position description, whereas before it really wasn't counted much.

Interviewee 5, Level D, IRU

In some departments and schools in Australian universities, staff in education/teaching focused positions have chosen that pathway or have been recruited to it. In others, it appears that non-performing researchers are 'tapped on the shoulder' with the suggestion of 'doing more teaching'. Respondents expressed concern that demonstrably good teachers are nonetheless tarnished with the 'failed researcher' reputation.

When people talk about education focused academics, I don't – often we look at that and we say, well there's someone who has no involvement in research.

Interviewee 6, Level E, IRU

Many universities are putting effort into defining the education/teaching focused role and into defining the criteria for such a role. Despite the development of criteria for promotion based on teaching excellence, many believe that academics are still promoted primarily on their research success. It has also been observed that the education/teaching focused route is an easier pathway. Several of the interviewees asked

Are we headed in the right direction as universities in science education within the science faculties?

I think if the rhetoric that we hear was mirrored accurately by the things that happen then we would be on the right track.

Interviewee 7, Level E, ATN

Respondents reported that the education/teaching focused academics were viewed by their colleagues as 'failed researchers', especially if they were transferred into this position because of underperforming in research and unsuccessful in securing grant funding. Such practice has generated a lot of suspicion with respect to the credibility of the role and its incumbents: people believe that teaching focused academics, as 'failed researchers', are opting for the education/teaching focused pathway as an alternative. Despite the fact that researchers are more highly valued, one respondent commented that if you are still a disciplinary research academic you are perceived as not being a fully committed teaching academic.

There are perceptions of gender bias in the education/teaching role. Women are perceived by some as not being as good as men because they are not as research-active (due to their occupation of more education teaching focused roles). This appears related to the perception that education is 'women's work'. However, when it comes to leadership positions in education, more men than women occupy teaching leadership roles, for instance, sub-deans teaching and learning. Respondents recounted anecdotal evidence about cases of promotion where they had suspicions that men had been preferentially promoted into these positions because they were men.

Because he's a boy and he gets on. Our head of school is – runs the place a bit like a boys' club, he would be the last person to admit that. He thinks he's very kind to women and the director of education thinks he's very kind to women too and he is kind but his view of what women can do is I should help women, not I should provide opportunity for challenges for women.

Interviewee 2, Level D, Go8

[Are most of the education/teaching focused people women?]

Yes.

Interviewee 2, Level D, Go8

Lastly there was some commentary on whether education/teaching focused academics should be recruited. Interviewees indicated that academics should be recruited on their research expertise and then be in an environment which allows for the talents and skills to emerge. These talents, they said, should be valued for what they contribute to the academy, instead of imposing a tacit system of values on academics and a negative judgement if it is not research which is implicitly valued.

We should not be recruiting education/teaching focused roles. We should have academics appointed who are TnR [teaching and research role] academics depending on where they want to focus.

Interviewee 17, Level D, Go8

We shouldn't have teaching focused or research focused positions. I think a

career starts off in one place and ends up in another place, and in between those two extremes, there's sort of an up and a down and a backwards and forwards depending on circumstance, interest and opportunity.

Interviewee 7, Level E, ATN

Everybody in this place who is here because they love what they do has value and we ought to be building a system which instils in people the value of what they innately bring.

The right questions (in promotions) is what value do you bring to this place? Instead we ask how good are you?

They're different questions, because when we ask how good you are we make it a unidimensional question.

At XXX there's a bit in brackets that's not said, but which is implied: how good are you at research?

That's the question we ask promotion.

Interviewee 15, Level E, Go8

Expertise

It was clear that the role of being an 'expert' in an area was well understood by the academic community. Interviewees clearly understood that research academics have 'expertise' as creators of new knowledge in science disciplinary research, and that teaching and research focused academics are also 'experts' through creation of new knowledge in science and education research. They also understood that the 'expertise' and research of education/teaching focused academics is less well defined and not at the same standard as disciplinary research. There was a clear hierarchy of expertise, with science disciplinary research clearly being of most value. The longer academics stay in the education/teaching focused positions, the more their expertise in the discipline declines over time; their area of 'expertise' becomes unclear and they become 'de-skilled'.

... with the current focus on research, there is not the same attention to the teaching and learning function in universities; there is a danger of 'de-skilling' academics.

Interviewee 7, Level E, ATN

The university has, should have some responsibility for ensuring that the researchers that are teaching at least have reasonable skills in imparting their knowledge so that the students actually learn something and don't just get really bored by someone speaking either above their level or in a very boring way or presenting it in a way that's not engaging and all those sorts of things.

Interviewee 4, not university affiliated

The bias at universities in favour of research expertise limits the development of 'expertise' for education/teaching focused academics. The education/teaching focused academic spends more time in the area of teaching. Whether they become experts at education and teaching, however, depends on their personal discipline, mentorship available to them, and on their professional development. There are currently limited mentor models for education/teaching focused academics. Early career mentorship is generally for early career researchers, and in education mentorship needs building. Education/teaching focused academics have little opportunity and success in disciplinary research grants due to being unable to have sufficient time to create the research track record required. There are few opportunities to develop and submit grant applications in education.

The bias in favour of research expertise results in the devaluing of teaching expertise. Most, if not all, interviewees felt that their institution did not value education/teaching expertise as highly as research expertise. The generation of research outputs is also encouraged above teaching activities. Academics, including both teaching and research, and education/teaching focused academics, feel a constant pressure to improve their discipline research output at the expense of developing their teaching expertise.

But in fact the real heart is going out of the teaching and learning function at universities. So I think it's a national issue.

Interviewee 7, Level E, ATN

Interviewees also commented on the volume of teaching assigned to the education/teaching focused academic. Some thought that teaching-only positions are suitable for the teaching that involves 'churning it through', the 'thousands of hours' of teaching students the basics. There is the real potential for education/teaching focused academics to be limited in their scope of teaching by the university. According to anecdotal evidence, some education/teaching focused academics are given first- and second-year teaching only because third year needs to include research-related content, which these academics are deemed not to have, because they are not at the 'cutting edge' in a particular area of their discipline.

I made a comment about teaching-only people feeling as though they're more valued if they teach at second year or third year as opposed to first year and in my opinion teaching at first year is the hardest because often they're bigger classes, they're more diverse and that's where it's a challenge for teaching. I think they're just not up with the cutting edge in a particular area of their discipline. We're good for teaching the breadth and the basics, basic concepts in our discipline, but not actually for taking students right to the cutting edge of the research frontier.

Interviewee 2, Level D, Go8

Once education/teaching focused academics do not have access to the cutting-edge knowledge that comes with adding to one's disciplinary knowledge, the role has the potential to become a ghetto for teaching and nothing else, with no opportunity to engage in scholarly activities that would develop one's disciplinary knowledge and research prowess. Education/teaching focused academics are often left to do the teaching and learning administration which could be done by professional staff; this limits time for innovation, and consequently limits chances for advancement. Education/teaching focused academics become time-poor; being overloaded with teaching leaves little time for research, attending conferences or networking. One interviewee suggested that being only able to do research in education and being overloaded with teaching responsibilities could create a ghetto.

I think if you do that then you start to create a bit of a ghetto don't you. I think that's what people are really scared about is that you go into this institution of the future where you have a whole bunch of people who just do the teaching and a whole bunch of people who just do the research because we can see how it would go that way. So I've got these teaching people and I want to do my research so we'll just give more of the teaching to them. What else would they be doing anyway?

Interviewee 5, Level D, Go8

It is clear that an education/teaching focused role can devolve into teaching only. One institution suggested that teaching focused academics could be used for service teaching where large class sizes mean delivering thousands of hours of teaching. Such a practice leads to complete inflexibility and most likely complete immobility – being able to only be at one institution for the remainder of the career.

Being overloaded with teaching leaves little time for research, attending conferences or networking.

Interviewee 9, Level E, Go8

Also I think – depending on who the Teaching and Learning Chair is, actually getting staff to have – the T focused staff – a reasonable workload is quite difficult to manage.

Interviewee 8, Level D, Go8

Despite the fact that not all universities have teaching focused or teaching-only positions, many respondents expressed the view that expertise in research and teaching are equally important. The need exists to ensure that the utilisation of teaching strength does not limit the academic's concurrent development of expertise in research (disciplinary and education research) and teaching to a deleterious degree.

I guess their role in education is obviously teaching the content, teaching an appreciation of the discipline but also then that whole application of that to the real world is really important. Also I think they need to come across as passionate about their research so that they're not just a teacher in a school, there's something, there's got to be something more than just being a teacher in a school.

Interviewee 4, not university affiliated

Interviewees suggested ways to link teaching and research expertise. Often it was suggested that the relationship between research and teaching enhanced teaching performance. Education/teaching focused academics can create a pool of knowledge about teaching which provides opportunity for publication. To do education research requires a wider range of research tools. Academics require opportunities for training in qualitative skills to complement quantitative skills. The challenge is that many education/teaching focused academics have been trained in science disciplines with quantitative skills, while to do education research requires retraining in qualitative skills.

Scholarship

In the global education marketplace, research forms universities' reputations. Universities are incubators of discoveries and creators of new knowledge through research. When questions were raised about the quality of scholarship in academic roles, it was clear that disciplinary research was considered most valuable, which is what you might expect in many of the research intensive Go8 universities. It was clear that research done by education/teaching focused academics, especially in education, was viewed suspiciously. Interviewees commented that not only was this research of dubious quality, it could not be counted in the Excellence in Research for Australia (ERA) initiative, and even those who have done good quality research in education and published in international leading journals were also suspicious of the quality of educational outputs of their colleagues.

They are looked at somewhat suspiciously these people who are doing education focused activities. 'That scholarship isn't really very rigorous is it? It's not highly valued. It doesn't have a very high impact factor for those journals.' I've also heard that from people who are in that space doing their education research. It's one of their complaints about it, that it is regarded as a softer scholarship than the normal science that we're used to.

Interviewee 11, Level E, Go8

The view of scholarship of education/teaching focused academics as substandard was seen through actions of universities in recruitment of academic staff. Whereas a quality disciplinary researcher may be head-hunted and provided a position without advertisement and then paid a higher financial remuneration, this was very unlikely to happen to an excellent teacher or education/teaching focused academic who produced quality research.

A high profile researcher and his team will be 'parachuted' into the School (ie they are being poached from elsewhere), these sorts of parachuting appointments prevent filling desperate holes in teaching but will increase total research performance ... they are typically for research only appointments, and are never done for high profile teachers.

Interviewee 7, Level E, ATN

What is more insidious is those people that there is no advert for. They actually appear because they have been head-hunted and it's all done very secretly. Done behind closed doors. There is no general knowledge to why the person is employed what the criteria were.

No-one comes through the door by stealth is a high quality teaching and learning expert in science. That never happens ever happens.

Interviewee 7, Level E, ATN

Reputation

Expertise is linked to reputation.

A good teaching reputation rarely moves beyond the walls of the institution.

Interviewee 9, Level E, Go8

It was a view held by almost all interviewees that academics in education/teaching focused roles suffer from a poor reputation simply by being in the role. The perception that these positions are for non-performing or failed researchers is enduring. Credibility and validity as a scientist, as evidenced by a strong publication record in disciplinary research. Institutional reputation tends to lend credibility to one's role as a teacher and an individual's reputation. Interviewees clearly outlined that academics in research roles have an upper trajectory in terms of reputation and they spend their time constantly adapting to the next big idea in their research. Similarly, the teaching and research focused academic had an upward trajectory, albeit perhaps slower, dependent on how well they could deliver in all aspects of their role. In contrast the education or teaching focused academic needs outstanding performance as a teacher or requires substantial upskilling to build a good reputation in a field for which they are not trained. How a university performs in the ERA rather than teaching is a significant contributor to both their rankings and reputation and then the subsequent student load.

The view ... at the moment from the senior management is that the teaching focused roles aren't necessarily valued. It's not needed.

Interviewee 10, Level D, Go8

Their value to the university. I think in the discipline levels they would be very highly valued. I think in an institutional level though there's a decreasing sense that they're valuable.

ERA is a big thing for us because ERA carries no money with it but it carries a lot of reputation ... We need to do well in the ERA exercise if we are going to claim to be ... the best research university in the country.

These comments reflect the significance that Australian Research Council (ARC) and category 1 research funding have within the sciences. Education research funding is not seen as prestigious. Success with research funding, especially category 1 funding, has a large effect on reputation and academic identity, and can make a researcher's reputation. Once an academic is designated as teaching focused, they find research funding more difficult to get because they no longer have the track record in an increasingly competitive environment where research funding is declining. As a result, their reputation and identity as an academic are adversely affected. The same opportunities to attract funding via prestigious sources does not exist for education research or for teaching focused activities. One of the main sources of education funding in the Office for Learning and Teaching finished when this office was closed. Even when this source of funding was available, teachers were held in lower esteem than researchers. It is unclear whether reputation for education/teaching focused academics will ever be the same as being a researcher within a university. Several interviewees were of this view.

I think the other thing about changing the culture about teaching and getting teaching valued is, it won't change. It has to be a two-way street. There's one way to build up the teaching focused sort of people, but you can't still let the T&R [teaching and research] people keep getting promoted, when they're barely falling over the bar on teaching. They wouldn't get promoted if they were barely falling over the bar on research.

Many interviewees suggested ways by which reputations could be built. Reputation is linked to the appearance of credibility, validity, value and visible accomplishment. Several ways were suggested to improve reputation and credibility of education teaching focused academics. The first of these suggested was a clearer definition of the role and promotion criteria that will enable colleagues to more easily recognise good teaching philosophy and practice. It was also suggested to make the criteria by which good teaching is assessed clearer and more holistic in focus and to review the metrics used to assess good teaching performance. Some interviewees reported that hiring learning designers for curriculum development, especially those with science qualifications, lent credibility to the teaching space. Success in attracting funding through large grants also gave credibility to education research. The support from heads of school and those in leadership positions was seen as building the reputation of education/teaching focused academics, especially when they are valued by authority.

All these strategies serve to strengthen the view that teaching focused positions are genuinely merit based, thereby changing the perception of the role as an exit strategy for 'failed researchers'. It is critical that education/teaching focused academics are trained in education research and are familiar with the literature and the methodology. There is a need for all staff to complete a graduate qualification in higher education and a fellowship. Training in education research includes training or retraining in qualitative research techniques, which are not always necessary in the sciences but offered in allied disciplines such as health sciences. The need to maintain one's familiarity with disciplinary-specific knowledge and advances in thought can only occur by devising new partnerships where researchers and educators are linked.

Funding

Within universities, research funding remains highly sought after. Research funding can make a researcher's reputation. The effect on reputation and academic identity of success with research funding, especially category 1 funding, is an institutional as well as an individual goal. When education/focused academics receive research funding, there can be an acknowledgement that education research is worthwhile.

When XXX was successful in getting category 1 funding for OLT [Office for Learning and Teaching] projects, this was seen as a paradigm shift.

Interviewee 12, Level D, Go8

In terms of research funding sources in relation to the academic role, the playing field is clearly not level. Interviewees clearly outlined that research academics and teaching and research academics have access to category 1 funding, although this is declining. Individuals in institutions with better reputations, such as the Group of Eight (Go8), have a higher likelihood of success. Those academics in full-time research have the highest chance of success because of their track records. Teaching and research academics, although they are increasingly finding funding more difficult to get, still have the possibility of success for category 1 ARC funding. Education/teaching focused academics will rarely have the opportunity to be successful in funding for disciplinary research. The longer they remain in this role, the less the likelihood of disciplinary research publications at the level required to be competitive.

The core business of a university, however, is equally research and teaching. Teaching income subsidises research costs because research grant funds do not cover all associated costs of research), and this is not widely recognised within universities.

Progress and promotion

Interviewees reported that rate of progress and the standard for promotion differed depending on the academic role. The research focused academic progressed most rapidly compared to the education/teaching focused academic. The teaching and research academic and research academic may progress at similar rates. Many interviewees commented that in promotion education/teaching focused academics still required disciplinary research to 'get them over the line', whereas academics with outstanding research track records could afford to 'barely fall over the line' in teaching. To be promoted as an education/teaching focused academic needs substantially more than just good teaching because all academics are expected, regardless of their role, to be good teachers.

I think the other thing about changing the culture about teaching and getting teaching valued is, it won't change. It has to be a two-way street. There's one way to build up the teaching focused sort of people, but you can't still let the T&R [teaching and research] people keep getting promoted, when they're barely falling over the bar on teaching. They wouldn't get promoted if they were barely falling over the bar on research.

Interviewee 5, Level D, IRU

... they got the teaching focused positions but they had a strong disciplinary background but they wanted to switch directions. But even in the promotion process still publishing within their discipline and then doing a discipline based education research just seems to be what got them over the line.

Interviewee 10, Level D, Go8

I mean when you do teaching they say, if you're going to get promoted on the basis of your teaching, it's not enough to be good at teaching, because we expect all of our people to be good at teaching. You have to be doing more than that.

Yeah, look different levels of promotion, but definitely when you're trying to get into senior ranks, leadership is it, really. I mean there's other things that you have to do, but really if you're going to set yourself apart from others, then you have to be doing leadership of some kind.

Interviewee 5, Level D, IRU

There was an enduring perception among interviewees that success as a researcher is favoured above success as a teacher and that promotion is still biased towards research even when the academic can meet the teaching and service criteria.

In the words of one teaching and research academic:

[How would you – what would you evaluate of yourself to put down to demonstrate that you've been effective in your role for promotion?]

Publications, grant funding. Again, this is largely I'm being evaluated by research people who value those things.

Interviewee 13, Level C, Go8

Part of the issue with promotion success is that great variability exists among institutions with respect to the need to do disciplinary research in the education/teaching focused role. Interviewees from institutions shared a range of experiences from the need to do it to being forbidden to do it. In some institutions, it is expected that the education/teaching focused academic will do educational research and demonstrate scholarship of teaching and learning including journal publications, conference publications and other activities such as running workshops. Although maintaining and adding to one's discipline knowledge is essential to good quality teaching, experience in disciplinary research is essential to developing this knowledge, and there are limited opportunities to do this when in an education/teaching focused position.

There is also great variability among institutions in promotion criteria and metrics. Australian universities place strong emphasis upon student evaluation survey scores. The overall impression is that they are useful but not completely reliable as indicators of a teacher's performance. Many of the criteria are performance-based, for instance unit of study surveys and teaching awards. There is a strong feeling that the criteria for promotion need to be more holistic, including teaching philosophy, reflective practice, qualities such as inspiring to learn, and teaching and curriculum leadership.

... not just evidence of performance, but look at their philosophy, awareness of their own teaching approach and practice – promotion should be not just based on quantity.

Interviewee 14, Level E, Go8

The School of Biological Sciences. We don't do a lot of service teaching. So I think contributions to staff meetings, teaching committees and just general dialogue with people coming to seek advice from you is actually really important. It's very hard to articulate. I don't think on promotion applications it's very well recognised. It's not very easy to express. So I think something along those lines would be really useful.

Interviewee 13, Level C, Go8

The perception that the promotion criteria for the teaching focused role still favour success with publications and grant funding over demonstrations of good teaching practice reinforces the perspective that disciplinary research success is still valued above teaching ability. There

is a growing need among institutions to set criteria and benchmarks for promotion which are understood in the sector. This is a difficult process in practice because what individual panel members look for as signs of teaching success can vary. Education/teaching focused academics seeking promotion lack awareness of what is objective evidence.

They [teaching focused academics] have to be more proactive and they need to go have conversations with people on the promotion panel. I know a lot of people on the promotion panels in science and they always tell people come and talk to us. We want to help you. But most people I don't think actually take up those offers.

Interviewee 10, Level D, Go8

So even in terms of promotion, people who get promoted at different places – I know somewhere – my ex-employee who went to Curtin she just got a level B job with [Alex]. She's gone to work with Alex and they're talking about promoting her to senior lecturer because it's her second year in a level B job. We wouldn't even have her confirmed at the university. So the standards – I mean not that she's not good, don't get me wrong.

Interviewee 5, Level D, Go8

The interviewees provided recommendations to support education/teaching focused academics. These recommendations included making the teaching criteria for promotion more widely known, creating mentorship schemes and support networks amongst education/teaching focused academics, and sharing experience on how to collect evidence and successfully address the selection criteria for promotion. There were also suggestions to use strategies to bridge the teaching–research gap such as co-supervision of higher degree research students.

... that if you want to have an academic who's doing the research and the teaching at the same time, you've got to find a way to recognise the teaching in a way that complements that research is recognised.

Interviewee 10, Level D, Go8

Research

Overall, interviewees indicated that universities value disciplinary research above education. Within the academic science community, education research is not highly valued, and in some quarters is treated with suspicion. Education research is perceived as 'low level research' and as lacking in integrity by those who have not engaged with it. It is possible that in quantitative-dominant fields such as the sciences, qualitative research is seen as less than rigorous in its methodology. Educational research being published in low impact journals reinforces the view that education research must be of poor quality. Overall, interviewees indicated that education research it is not well understood within the science community, and a reinforcement of the 'superiority of research over teaching' attitude.

I think ... our research colleagues look down upon it and think it's low level research. They think it lacks integrity ...

Interviewee 2, Level D, Go8

There is nothing against somebody publishing in education but unless the outlet is an internationally reputable outlet, demonstrably with great impact ...

Interviewee 15, Level E, Go8

Then the discussion came, 'but then surely if they're teaching only they should be doing teaching related research'. That was then acceptable.

Interviewee 11, Level E, Go8

It was clear in Go8 institutions that education research in science faculties is undervalued and considered with suspicion even by those academics in education/teaching focused roles. This was exacerbated when ERA evaluations necessitated the shift of academics seen as 'failed researchers' into education/teaching focused positions. For those academics shifted into education/teaching focused academics roles, education research became something that they 'might be adequate to conduct'.

This commenced a cycle at several institutions of undervaluing and 'failure' of education research at research intensive universities. There was an expectation that 'failed researchers' encouraged to conduct education research might be prolific, not necessarily for ERA profile, if their publications are not seen as 'high impact' in 'top journals'.

I have a personal aversion to impact factors and I really don't like them. I don't like using them as a [driver of things]. I also, I actually don't really like the notion that you can judge the quality of an individual piece of work from a perceived quality of the journal in which it is published.

Interviewee 11, Level E, Go8

Systematically, education research in science faculties is disadvantaged for several reasons. High teaching loads restrict education/teaching focused academics' capacity to conduct and publish education research. Also, there is less likelihood of honours and postgraduate students or postdoctoral fellows who are interested in science education research. Science academics, especially successful disciplinary researchers, are also dissuaded from conducting education research. Fewer research assistants have the skill and motivation to assist in education research. The momentum required to create and run a research group able to do education research is also a barrier to success. Many interviewees commented on the difficulty and difference between an establishment of a disciplinary research lab compared to an education/teaching focused research lab.

[You're published in learning and teaching ... What do you think was the major challenge that you experienced in getting those papers together and getting them into review?]

Capacity, and what I mean by that is time. Two things; time, because ... most of my science colleagues, they've got a research lab with layers of people in it, so they've got PhD students, undergraduate students, postdocs and/or honours students. ... at my appraisal this year, my Head of School said, 'whoa, you've suddenly got four publications in the last year, you've had zero to one in the prior years, what's the difference?'

It's honours students, I've had a stream of honours students, one a year for the last four years. So suddenly I have capacity to do research. Instead of me trying to do everything, I have people who can help me to do it, or people who I can coach to do it.

Interviewee 13, Level C, Go8

Almost all interviewees agreed on the value of education research as a legitimate area of research. They suggested that promoting engagement with education research required support for education research funding grants, the formation and strengthening of intra-university education research, the promotion of communities which are diffuse within universities, the establishment of interdisciplinary communities where they can meet colleagues about potential research collaborators within their organisation and the need to make more people aware of its education discipline-specific content and methodology.

I actually wrote this on my promotion application at UQ [The University of Queensland] in my teaching focused position which is I have published with 39 scholars – collaborators – within and outside of UQ, most of them scientists. I said in that process of us working together as this interdisciplinary group that is what has helped them to learn and translate how do I actually publish in the scholarship of teaching and learning – to actually go through it and let them have the experience and grapple with the different language that comes with SoTL [scholarship of teaching and learning] as a social science more type of approach than what they're used to in their own disciplines.

Interviewee 10, Level D, Go8

Interviewees agreed that there is a strategic need to promote the pedagogical value of education research to the academic community, by publicising the positive influence of academics who are good at and enthusiastic about both research and education, to create cultural change. It was suggested that discipline-specific education research can be used to understand matters related to teaching within a discipline. For example, physics education research was conducted for the purpose of improving teaching after it was realised that physics is often difficult for students to learn. The perception that education research is less than rigorous (that 'there is dross' in the education literature) means academics tend to

ignore its content, which lessens its potential to inform good teaching practice. It was recommended by several academics that all academics engage with education research as a source of information about good teaching practice generally. The perception that the education research literature is being under-utilised as a source of information about good teaching practice appears ubiquitous within science faculties.

Community and connections

A further theme identified by interviewees, especially those in education/teaching focused positions, was community and connections. Interviewees clearly outlined that research academics had deep connections with a community of scholars both internally and externally, including PhD students, postdoctoral fellows and early career researchers. Teaching and research academics also identified networks as a critical part of their success, but may not be as deeply embedded in a scholarly community. In contrast, education/teaching focused academics connections are much less tangible with a smaller number of connections. Often there was a lack of community with little capacity for day-to-day contact with others.

There's heaps of connections around science that makes it clear to people I'm a leader because I can connect and link to all these things and I can demonstrate that. In teaching and learning I think it's much harder for people to show those connections ...

Interviewee 10, Level D, Go8

Many respondents in education/teaching focused positions identified the need for a teaching focused community. They defined community in a less focused manner – a diffuse network within the university, rather than solid intra-school or intra-faculty networks. It was clear that institutions had not prioritised the establishment of support mechanisms such as teaching networks and communities, perhaps because of the lack of understanding of the education/teaching focused role and its perceived lack of value. Academics commented positively on those universities, heads of departments and committees which had begun to establish science teaching communities and science education research groups.

The main structure that's made a big difference is that, once a semester, we have a majors meeting. A majors meeting is anybody who coordinates a course that feeds into a particular major within our degree programme, a major that our school is responsible for, comes along to a meeting. It's a three-hour meeting once a semester. We have some data available at that meeting, usually about assessment, usually about grade distributions. The information we have about assessment is the types of assessment, the timing of assessment, and we have a conversation.

Interviewee 13, Level C, Go8

... but if you're actually trying to get some money to do something or some time to do something or take a risk in doing something in teaching, if your head of department is not 100 per cent on board then you're going to be in trouble.

Interviewee 5, Level D, Go8

The other thing that's made a massive difference is the, I guess, final realisation from my Head of School and Deputy Head of School and Teaching Learning Chair – the person who is in the Teaching Learning Chair role now, for the first time, is very collaborative, very inclusive, has a vision. So those three people are finally asking the question, what value can XXX contribute? I've been trying to knock on their doors, trying to engage in that conversation for a number of years without success, because teaching and learning hasn't been their priority area.

Interviewee 13, Level C, Go8

Respondents also observed a lack of teaching leadership, or 'disinterested' leadership shown by heads of department, committees or school. Their commitment to active leadership in teaching depended on their own interests. Almost all respondents commented on the need for senior academics to recognise teaching activity and achievement.

It was – I remember her telling me – it was like head of school, my head of school – and she knew if she sent out an email offering training or support or whatever for sessional staff, it depended on the head of school whether the staff got to know about it because some heads of school were just like 'delete'. My head of school would send it around to everybody and the sessional staff would go 'oh, that looks like a good thing'.

Interviewee 3, Level C, no group

To enhance and improve connections, respondents stated that new ways of sharing and building on collective experience are required. Suggestions included co-supervision of students as a way of gaining experience, increasing exposure and establishing network contacts, and encouragement for education/teaching focused staff to attend teaching practice and education research conferences. Other suggestions were promoting enrolment in the Graduate Certificate in Higher Education, to enhance learning about the processes of education research and to introduce candidates to others with interests in teaching and education research; and the formalisation and promotion of peer evaluation and peer review of classroom teaching to develop and disseminate insights into good teaching practice, and to build connectedness among teachers. It was suggested that science education should be embedded in research groups among teaching focused academics. It was also recommended that collaboration occur with education research communities who can inform good teaching practice. Finally, it was suggested that there needs to be institutional support for interdisciplinary research in education which broadens the ways of thinking about science

education.

Overall, such initiatives develop and build networks and communities with the purpose of mentoring and sharing information about good teaching practice.

The career pathway for education/teaching focused academics has become better articulated in position descriptions and selection criteria in promotion. Although promotion at the lower levels is well accepted, promotion to higher levels such as D and E require academics to demonstrate leadership. Often Level D needs to demonstrate impact at the national level, and Level E at the international level. As education is often a collaborative endeavour, the individual contribution and leadership can be difficult to measure. Institutional-level support for the creation and facilitation of leadership in education was identified as critical by several respondents.

Yeah, so in the Australian community, there's leadership shown by professors in their research area. That really drives agendas in the community, so whatever my area happens to be and I'm a professor and I get an ARC grant and I get students – students want to come and – and the post docs come and that's the leader. They build up a community around them. Where are those communities in teaching and learning in mathematics?

Interviewee 5, Level D, Go8

The first, biggest thing that happened to me, which allowed me to make that move, was the DVCA [deputy vice-chancellor (academic)] at the time wanted some people to apply for OLT [Office for Learning and Teaching] and ALTC [Australian Learning and Teaching Council], at that time, grants. I said look, I have no idea how to do that. It doesn't – it's not something I've ever done before. So she gave me somebody to help me write it who was from education, and who knew how to write those things, and had the right skills. That person really mentored me ...

Interviewee 16, Level E, IRU

So you need someone to be championing you and proposing and supporting you and we've had – we've got various people in the school who have that and some who don't, and people who don't have that, don't do as well as people who have got someone.

Interviewee 2, Level D, Go8

Respondents suggested that to isolate education/teaching focused academics would not strengthen the nexus between research and teaching. Restoring the partnership between research and education and valuing education/teaching focused academics, would redress the balance.

But I think a good academic needs to be able to talk to their students and give them a sense of what research is. If they spend three years doing some consultancy or some work with industry – research with them, then that's good as well.

Interviewee 7, Level E, ATN

I think that's bad because then we're going into the situation where we don't have researchers who are teaching, we don't have innovation and people bringing in the ways of thinking of being a researcher. I'm a big believer in people needing a discipline. Even if they don't use it throughout their whole career they've come from a situation where they've been a discipline researcher because that's really the only way you can review your teaching with what it means to be a discipline expert in that area. How are you going to train a physicist if you've never actually done research as a physicist and you don't know what a physicist needs to do in their job and think about things from a physics point of view?

Interviewee 5, Level D, Go8

There were suggestions of ways to link teaching and research in productive partnership. These included academics focused on education research to provide a pool of knowledge about teaching and communication through publication and a focus on research-led education as a way to link teaching and research expertise.

Evidence from research conducted in the US suggests that the nexus between research and teaching success can enhance one's teaching performance as one becomes more reflective and more critical (Valli, 1997).

View of students

All respondents emphasised that academics within universities had obligations to their students and that the movement towards the focus on the education/teaching focused academic could have negative flow-on effects for students. Many respondents viewed student education as an investment which should be a transformative experience.

There must be outcomes for the student.

Interviewee 17, Level D, Go8

I think it's very hard to demonstrate learning in a robust, scientific way. How – what I did just caused someone else to have great learning. That's, I think, a very tricky thing to make that very clear cause and effect link to. But I do actually – I am increasingly worried when we start to move very individualistically to look at me, I'm a good teacher. I need to prove that to you and now I need to prove that to the promotion committee – I am a good teacher – that's sometimes what we're losing, is the actual focus on learning and students.

Interviewee 10, Level D, Go8

... their idea of teaching excellence was great, this person uses humour and they do it to a hundred – 500 students. It became again about numbers, size and bigness. So this is a group of scientists making decisions about what good teaching looks like – in their thought process was not what are the learning gains for their students or even what does that person want their students to learn?

Interviewee 10, Level D, Go8

Universities have two obligations to their students and the community which shares the cost of education: to recruit graduates with a deep knowledge of their discipline and to prepare students for employment.

Interviewee 4, not university affiliated

This concern was demonstrated by the identification of the need to develop metrics for evaluating students' learning progress throughout the degree and not just in individual units of study.

They [teachers] might not always be getting it right, but the ones who are talking about assessment, the ones who are saying, 'I don't think that worked very well – I think I need to change it', the ones who come in and say, 'I'm really worried about my students' and the ones who come in and say, 'I'm not doing very well at this, can you give me any hints?' I would classify those as the good teachers, because they're actually thinking about it.

Interviewee 5, Level D, Go8

All academics, whether research focused, teaching and research focused or education/teaching focused, stated that the role of an academic is to help prepare students for employment and that to secure this requires teaching the discipline content, imparting an appreciation of the discipline and translating discipline-specific knowledge to real world contexts. To do this, academics have a responsibility to develop ways to engage students with knowledge and display passion for their research and their engagement with their discipline. Metrics for measuring teaching excellence can lose sight of the concern for students' learning. Appropriate considerations are the learning gains for students or even what a person wants their students to learn.

Metrics and merit

While metrics are something that most academics understand, especially to measure excellence in research and impact such as *h*-index and journal impact factor, less is understood about how to measure excellence in teaching. More nuanced performance indicators which are understood are required if education/teaching focused academics are to be valued and respected in higher education. Many respondents argued for the development of a more holistic model and metric for evaluating an academic's performance for purposes such as promotion and merit awards. More nuanced metrics need to be developed to

measure teaching excellence. Many respondents stated a long list of metrics which could be used, including teaching performance, collaboration and constructive influence on colleagues, mentorship, leadership, innovations in teaching and learning involvement in community practice, active engagement with students' learning, inspiring students to learn and achieve, academic engagement with teaching, engaged students, and formal and informal student feedback.

Respondents suggested turning peer review of teaching into a metric. Peer review of teaching already exists in some institutions but is used for developmental rather than judgemental outcomes. Some seemingly judgemental metrics were however seen as positive in outcome. For example, a respondent discussed the potential to have inspectors independent of the institution sit in classes and give teachers a 'score card'. This would be seen as constructive because of the confidence-building aspect related to knowing that the inspector was experienced in terms of having assessed a lot of teachers, and the consistency of scoring between classes and teachers could be ensured to some degree by this method. Another suggestion was to have peer review from within and from outside of the discipline to assess the accuracy, relevance and currency of discipline-specific knowledge being delivered and external to the discipline, to assess one's teaching from a more general perspective.

Three other metrics were considered of value, although respondents made clear that some criteria are simply not suited to be turned into metrics, or to be represented by metrics. Those characteristics of successful academics are:

- collaboration and constructive influence
- mentorship
- leadership.

Collaboration and constructive influence is a measure of the influence on others – one's reach with respect to peers' teaching and learning; influence on immediate colleagues; willingness to collaborate, engage and share teaching expertise with others. The suggested means of evaluation were input into teaching and curriculum meetings, discussion of assessment and grade distribution matters and qualitative feedback from students about how a teacher helped their learning.

Mentorship consists of encouraging others to research and publish in education. It was identified that mentorship of others can be difficult to measure and goes beyond perhaps counting the number of academics who have been successful because of an intervention. Leadership metrics were also highlighted as difficult to measure. Although leaders can be identified as those who influence the practice of others both within and outside of their discipline, formalised descriptions of roles and responsibilities such as 'program leader' and 'unit co-coordinator' fall short of defining leadership. Evidence of education leadership through publication success is only one indicator; running successful workshops and

conferences is another. The clear difficulty in identifying an individual's contribution to a collaborative endeavour was commented on by several respondents.

Leadership shown by professors in their research area drives agendas in the community, so whatever my area happens to be and I'm a professor and I get an ARC grant and I get students – students want to come and – and the post docs come and that's the leader. They build up a community around them. Where are those communities in teaching and learning in mathematics?

I think they use the metrics that they know and that's what happened to me, because I wasn't promoted so they used the metrics that they knew and it did not apply to me ... they said they couldn't understand what my intellectual contribution was. I had leadership, I had all the other things coming out, but they couldn't say I had discovered this blah in my individual original contribution.

Interviewee 32, Level D, Go8

Several interviewees commented that merit in education/teaching focused academic roles is difficult to objectively evaluate. They highlighted the dynamic nature of merit in an academic role.

Merit is not some set in stone, externally fixed, objective characteristics

Merit is whatever we decide it is for a particular decision point.

If merit contributes to be defined by research excellence or more heavily weighted in favour of research excellence, then ... people who have a more heavily weighted teaching background or teaching expertise, no matter how good it is the value of their experience will be weighted less heavily than the value of research experience if merit for academic promotions continues to be mostly defined by capability in that realm.

Interviewee 15, Go8, Level E

Although there was positive commentary on the acceptance of a differentiation in academic roles, and a future where all would be equally valued, there was also commentary that the future would remain exactly the same in terms of merit, and those who were more optimistic were delusional.

The people who say it's changed think it's changed. But they don't know is ...

That's the game in front of you. What an awful game, right. You might bring untold value to your department, your local area. You might be the rock on which your department's built. It doesn't matter. It doesn't matter. We don't know you. Tell us – and have these six people who know nothing about you tell us about you right. That's the game. It's a handicap race.

Interviewee 15, Go8, Level E

Promotion policies

The criteria for promotion for teaching and research academics is detailed for those universities which had publicly available criterion (Appendix B, Table 2). Detailed information on the standards and criteria that are expected of academics at each subsequent level (A–B, B–C, C–D and D–E) are stated by each university and generally workshopped with staff prior to applying for promotion (Appendix B, Table 2). Some universities have a second step in level E which is awarded on merit, not by promotion. Nine universities (including five Go8 universities) gave specific criteria and expectations for education/teaching focused staff which were different to the criteria for teaching and research staff: University of Sydney, University of New South Wales, The University of Queensland, The University of Western Australia, The University of Adelaide, The University of South Australia, Griffith University, James Cook University and Australian Catholic University. The remaining universities give one overarching description of the academic role which set expectations for all academic roles and a breakdown of components into teaching, research, service, etc. These components were then weighted accordingly to the academic role. For an education/teaching focused academic whose workload specifies 80% teaching and 20% research, their promotion application will be weighted in the same proportions. Where separate criteria are given for education/teaching focused academics, the criteria mirror the teaching component for teaching and research academics. In some cases (as is the case at The University of Adelaide and University of Technology Sydney), education/teaching focused academics are required to produce a teaching portfolio, which provides evidence of teaching excellence to be promoted. This portfolio includes reflections, achievements and development of teaching excellence over time. The portfolio is not exclusively used for promotion; academics not currently seeking promotion are in some cases encouraged to produce a portfolio.

The promotion criteria for teaching and research academics requires dual leadership in the field of disciplinary research and leadership in the quality of the student experience. This core criterion appeared in promotion policy greater than 20 times in 28 promotion policy documents. The next most common criterion for teaching and research academic staff was scholarly publications in both disciplinary research and education, followed closely by curriculum design and at the same time higher degree research supervision. There was also an expectation that a teaching and research academic be successful and attain outstanding student evaluations on teaching performance and at the same time secure success in competitive ARC grants. There is also an expectation that they will receive rewards for excellence in teaching and make original and innovative contributions to their field of study as evidenced by citation rate and *h*-index. In contrast both the education/teaching focused and research focused academic have more specific criteria. They need to excel as their role describes in either education/teaching or research. An education/teaching focused academic needs to exhibit strong teaching practice and a scholarly approach to teaching across different settings as well as have a very high to outstanding student evaluation, and have specific pedagogical content knowledge. They are expected to devote the majority of time to

curriculum design and teaching excellence and disseminate their work on scholarship through publication and high quality peer-reviewed outlets as appropriate for their discipline. The research focused academic needs to receive national and international recognition for their expertise in disciplinary research and have the co-commitment funding and high *h*-index and citation index which aligns with this academic role. In teaching they need to have quality performance as indicated in surveys and outcomes for students, but the expectations are much lower than expected of the education/teaching academic role or the teaching and research academic role. There is an expectation in a research focused academic that there will be an impact of their research on policy and practice, and to do this they will be closely aligned with industry and have an entrepreneurship agility which leads to commercialisation (Appendix B, Table 4).

Workshops

Academics who attended workshops identified four main sources of evidence of quality teaching. Sources of evidence of quality teaching were from students, teachers, peers and employers (Appendix B, Table 5). Within each source of evidence, there were several themes which were identified by multiple participants independently at different workshops. These criteria could be considered as the most valuable.

Students

Quality teaching as evidenced by students was divided into five thematic areas: student learning and assessment, student growth and confidence, student retention, student evaluation and feedback, and engagement and attendance (Appendix B, Table 5a). Each of these themes contained comments that re-emerged at all workshops. Student evaluation and feedback was identified as evidence of quality teaching at all four workshops (Appendix B, Table 5a). There was, however, much debate on the validity of student surveys on units, especially the quantitative metrics. Qualitative comments from students were seen as a more reliable measure of teaching quality, although the poor response rate was highlighted and it was questioned whether students can assess what is 'good for them' and whether student opinion at the end of the unit is a good measure of teaching quality. It may be that if students were assessed in five years they would provide a different response, once they have used what has been learnt in the workplace. The comment 'not student bloody opinions' highlights the tensions around the value of student evaluation and feedback on units. Student engagement was commented on as evidence of quality teaching in three workshops. Comments on engagement ranged from face to face interactions and number and quality of questions to the co-creation of the curriculum with students. Student learning gains as measured through assessment and exam performance were all considered as evidence of quality teaching and commented on by participants at multiple workshops. Student growth and confidence such as improvements in critical thinking and problem solving, self-confidence and understanding were also considered important and identified by participants at several workshops.

Teachers

Quality teaching as evidenced by teachers was divided into six thematic areas; student satisfaction and wellbeing, pedagogy and curriculum and unit design, personal skills and organisation, reflective practice and mentoring, disciplinary content knowledge, and student improvement (Appendix B, Table 5b). Evidence of quality teaching includes the capacity and effectiveness in providing constructive feedback in a timely and meaningful to students which was linked to learning outcomes. The capacity of a teacher to build rapport and relationship with students and an environment which nurtured care and respect and student health and wellbeing was also commented on as an indicator of teaching quality. In addition to formal surveys, unsolicited student email and student nominated teaching awards were commented on by participants as evidence of quality teaching. The teacher's capacity to design of the curriculum based on effective pedagogy which differentiates for a diversity of learners and has the correct pitch were seen as critical in the creation of a positive learning environment as were the personal qualities of fairness, consistency and communication aligned with the setting of clear boundaries and delivery on expectations. Comments such as 'well-structured and scaffolded design that caters to a diversity of students' and 'course design and delivery' were identified in two independent workshops. Personal skills were only raised in one workshop, however a range of skills such as communication, flexibility and patience were identified as important criteria for quality teaching. At one workshop there was a discussion of a teacher being 'charismatic and being good looking' as leading to higher student satisfaction evaluations.

Reflective practice and mentoring was commented on as significant evidence of quality teaching as separate to disciplinary content knowledge' and 'the use of research knowledge to inform students'. Student improvement in general skills and problem solving was commented on in one workshop.

Peers

Quality teaching as evidenced by peers was divided into four thematic areas: peer review, recognition and awards, scholarship of teaching and learning, and peer relationships (Appendix B, Table 5c). There were less comments on peers as a measure of quality teaching; however, some comments were raised independently at two workshops. Peer review and uptake of teaching practice by others was commented on several times at two independent workshops. Peer review of curriculum and peer review of learning activities and material were both commented on once. Recognition and awards and invitation to conferences were both commented on as evidence of quality teaching in two independent workshops. University recognition of skill and peer recognition were commented on once. The scholarship of teaching and learning was commented on in two workshops as was engagement and being published in the scholarship of teaching and learning. Relationships among peers which build rapport and interconnections with technical staff and library and other professionals was commented on in one workshop.

Employers

Quality teaching as evidenced by employers was the least commented on, in only one workshop. At this workshop, employer opinions on graduates, work readiness of graduates and graduates meeting the standards of an accrediting society was commented on as evidence of quality teaching (Appendix B, Table 5d).

Overall there are distinct characteristics of academics in terms of roles and measure of success. These can be characterised in terms of expertise, connections, progress, reputation, mobility, funding and possibility of movement between academic roles (Table 6). Research focused academics or the 80–90:10–20 are best understood; they are creators of new knowledge and have deep connections in an ‘educational ecosystem,’ comprising a community of scholars from undergraduates to postgraduate higher degree research students; they make rapid progress depending on grant success and impact factors and have greatest capacity for movement between academic roles. Teaching and research, or the 40:40:20 academics, have some of these categories but, because they have an equal teaching to research loads, do not have as much time to focus on research. Although they have network connections, these can be shallower and their ‘educational ecosystem’ may be less stable depending on success in grant funding. As grant funding becomes increasingly competitive they can experience a decreased likelihood of success especially if in an unsupportive research environment. This is very much institution dependent, with more support if in a Go8 institution. Teaching and research focused academics are better able to translate science research through their teaching, and have good access to future higher degree research students. Although their mobility is dependent on job description, their disciplinary research still makes them attractive to other institutions and they remain competitive for positions. In an environment of increasing numbers of research focused academics, they are in an increasingly competitive environment for research students, as often the students are more attracted to be in laboratories of the research focused academics. Their expertise may be acknowledged by governance positions in learning and teaching, but these can be short lived and time consuming. They find it more difficult to progress as metrics that measure the teaching focused contribution are not understood and shared by their colleagues who sit on promotion panels (Table 6).

Table 6. Description of academic roles in terms of academic roles and measures of success

Role	Research focused	Teaching and research	Education/teaching focused
Expertise	Creators of new knowledge in a science disciplinary research using quantitative tools and analysis to create knowledge	Creators of new knowledge in science disciplinary research and may combine this with educational expertise. Greatest possibility to integrated research and education	Creators of new knowledge outside their science disciplinary research in an area where they may not have training. Nature of the new knowledge is more questionable
Connections	Deep connection with a community of scholars and students (tribal in nature)	Embedded but not leading... connections with community of scholars in discipline may be more peripheral instead of main player, connections with educational community, connections between research possible in practice, but less opportunities within the community (to connect educational and science research)	Often less tangible connections with a community of disciplinary scholars, less frequently students
Progress	Progress rapidly through ideas	Progress less rapid	Slow issues of funding, credibility, lack of a proper research framework. The issue of scholarship – is a real question
Reputation	Dependent on quality of research – constantly upskilling and adapting to dynamic research environment	Effectively dependent on research and managed through teaching ‘quality’ – but still often adaptable	Dependent on teaching. Substantial upskilling required if they are to build educational research reputation
Mobility	Probable dependent on reputation	Possible dependent on position	Not common
Funding	Category 1 although declining Mid-career ARC fellowships	More difficult to get category 1, unless in collaborative groups, or 2nd or 3rd tiered funding Mid-career fellowships non-ARC	Unlikely category 1 for science education research (although Linkage possible) Mid-career fellowships possible dependent on government initiatives
Movement between academic roles	Could be recruited into teaching and research or education focused	Unlikely to be recruited into a research focused position could move to an education focused position	Unlikely to be recruited into a research focused position
Metrics	Well understood. <i>h</i> -index, citation rate	Requires a reliance on Research Opportunity and Performance Evidence (ROPE)	Less understood

In contrast, education focused academics in science lose expertise in disciplinary research the longer they remain in education/teaching focused roles. The fundamental problem they have is the quality and impact of the educational research within a disciplinary setting. They do not have a similar community and access to students who are interested in education research when their training is in science is a barrier to success. In the current climate, research grant funding is dependent on government initiatives, but to secure this they need to be in cross-institutional projects where competition is great. In contrast to research focused positions who are most academically mobile and afloat (and are most able to move between industry and other academic positions), education/teaching focused academics are unlikely to be recruited into a research focused position or move back to a teaching and research position (Table 6). Some have argued, however, that although education/teaching focused academics are at risk in research intensive institutions, at this point in time even the research stars are in trouble as many fellowships are not renewed.

Chapter 4 Project impact, dissemination and evaluation

Academic Workforce

Our findings show that the current differentiation of the academic role has created three or four levels:

- education/teaching focused
- teaching and research
- research focused
- scholarly teaching fellows.

Data on the nature of the academic workforce indicates that 8.8% of the total academic workforce are education/teaching focused, 32% of the workforce are research focused and 59.2% of the academic workforce are teaching and research focused. Education/teaching focused academics have a workload of 80–100% teaching with 0–20% research or service, and universities in Australia, even those of the research intensive Go8, are hiring more education/teaching focused or research focused academics at the expense of both the traditional teaching and research and 40:40:20 academic (teaching:research:service). Although over the past decade, the total academic workforce grew by 6427 roles, education/teaching focused roles accounted for 48% of this growth, in order to meet growing teaching requirements, whereas traditional teaching and research roles accounted for only 16.6%. Research focused roles accounted for 35.4% of growth during this period. The Australian Catholic University had the greatest proportion of education/teaching focused roles, at 45.7%, while The University of Queensland had the greatest saturation of research focused academic roles, at 60%.

It is clear from this data that we are in the midst of a generational change in the academic workforce. A new tribe of academics is emerging – those who are education/teaching focused. Early on, education/teaching focused academics were created by transferring teaching and research academics into these roles as a consequence of the ERA assessment in 2010 because of underperformance in research. Around this time, universities such as Monash University and The University of Queensland created education/teaching focused roles, encouraging academics who were interested in education to apply. The creation of education/teaching focused roles was also a university response to both the ERA and the impact of the Bradley review of higher education (Bradley et al., 2008), which increased and diversified student enrolment. Community expectations catalysed this change, with the increasing university debt being accrued by students and the greater competitiveness of the job market creating higher demand for quality education.

We are now beginning to see universities advertising and appointing education/teaching

focused academics in science alongside the continued transfer of teaching and research academics into education/teaching focused roles. This is except for the Australian National University, which has a distinct mission as a research university. If the current trajectory continues, by the end of the century education/teaching focused and research focused academics will be the dual, dominant tribes within the workforce. During this century, with retirement and the further transfer of staff from teaching and research academic roles to education/teaching focused positions, the teaching and research focused academic will become rare. Perhaps surprisingly, this decrease will occur more expediently in research intensive universities. Consequently, by the end of this century, in research intensive universities the academic workforce will be made up almost exclusively of education/teaching focused and research focused academics; in other words, there will be a complete dichotomy of the academic roles.

Many, such as Coates and Goedegebuure (2012), have looked favourably on this conclusion, seeing this as an

inevitable conceptualisation and organisation of academic work and the academic career structure no longer meets the operational demands of the current environment and creates many barriers to success.

Universities are using workforce strategies to cope with certain challenges, including the increased competitiveness for declining research funding. It is now a reality that only those staff who can devote most of their time to research have a chance of being competitive. As indicated earlier, there are also altered expectations of what a university degree should provide, and academics with education expertise are needed to ensure that students fulfil a broader set of graduate outcomes.

Other reasons given for a differentiated academic workforce include that education funding should not cross-subsidise research (Norton et al., 2013), the lack of positive correlation between research and teaching, the fact that excellent researchers are not necessarily excellent teachers (Hattie and Marsh, 2004) and the belief that it is not possible for one person to excel in both the research and teaching components of the academic role (Bexley et al., 2011).

While many of us have experienced a highly talented researcher not being an effective teacher and vice-versa, the benefit of being taught by an active researcher in the discipline and student learning requires further investigation. When Begle (1972) revealed that advanced content knowledge of mathematics did not necessarily lead to improved student learning in mathematics, the question about the relationship between content knowledge and student learning received more interest (Ball et al., 1982). The importance of teacher's content knowledge has, however, been long established as important (Calderhead, 1996), but

how much of this content knowledge needs to be enriched by knowledge creation through research remains the question. Ball et al. (2008) proposed a framework for examining mathematical subject knowledge and defined three categories of subject matter knowledge which are important to consider. These are common content knowledge, specialised content knowledge and horizon content knowledge (Figure 5). Common content knowledge was defined as disciplinary content knowledge not specific to teaching, specialised content knowledge as specific to teaching and horizon content knowledge as an awareness of content in a discipline which crosses the span of the curriculum (Sztajn et al., 2012).

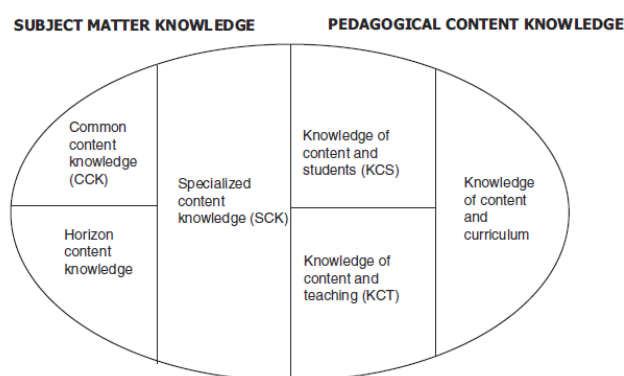


Figure 5. Domains of mathematical knowledge for teaching (Ball et al., 2008).

Education/teaching focused academics have all forms of subject matter knowledge (Ball et al., 2008), but the longer they remain within an education/teaching focused role, the more they move away from the new knowledge being created by research in the discipline. Many education/teaching focused academics interviewed in this study acknowledged this limitation and commented:

We're good for teaching the breadth and the basics, basic concepts in our discipline, but not actually for taking students right to the cutting edge of the research frontier. I think they're just not up with the cutting edge in a particular area of their discipline.

Interviewee 2, Level D, Go8

Although Ball et al. (2008) defined 'horizon content knowledge' as an awareness of how subject matter is related across the curriculum, a fourth category of subject matter knowledge, content at the emerging or leading edge of the discipline, also needs to be considered. Academics, whether they are research focused or teaching and research focused academic roles, create this 'leading edge content' knowledge and shape the emerging discipline. How this 'leading edge content' knowledge interplays with student learning is an area which requires further investigation. Academic identities have revolved around the holistic view of research and education for the past 150 years; stripping this back to its elements is bound to cause academics in those roles to question their identity. There remains a widely shared belief that

a good academic needs to be able to talk to their students and give them a sense of what research is.

Interviewee 7, Level E, ATN

A distinctive feature of universities is the combination of research and teaching (Norton, 2016). Education/teaching focused academics in science being less able to hold both aspects of the academic role together face the danger over time of being de-skilled, losing expertise and being removed from creating 'leading edge content knowledge'.

Several of the interviewees recognised these challenges.

... with the current focus on research [in universities], there is not the same attention to the teaching and learning function in universities; there is a danger of 'de-skilling' academics.

You see this is ... it's awful when people get de-skilled. You're forcibly de-skilling the person in that area, 'you will not be doing this'. That's de-skilling in my opinion and it's not good for anyone.

Interviewee 15, Level E, Go8

... they had to change research area ... start doing it by yourself, not by joining an established group which is already doing research,

... which already has a direction,

... which already has a track record of publishing,

... which already has a track record of acquiring grants.

Interviewee 22, Level C, Go8

Many have argued that the solution for academics in education/teaching focused roles being de-skilled is to reskill in the scholarship of learning and teaching to evaluate and measure student success. For science academics who have been mainly trained in quantitative research skills this shift to a different research area can be challenging. It may be more straightforward for academics in the social sciences to shift from disciplinary research to education research. Science disciplinary research is characterised by a high degree of general agreement on the methods of data collection, quantitative analysis and hypotheses formulation. Education research requires understanding and skills in a different research paradigm, where scholars commonly disagree (Gardner and Willey, 2016; Jones, 2011), and which can be difficult, confronting and time consuming to learn (Simmons et al., 2013). Becoming an educational researcher involves a transformation in identity. Handal (2008) notes that when an academic joins a new community they do not immediately take on those new values, but rather bring their own 'baggage' from previous communities. Academics in science have an identity strongly linked to their disciplinary research. Studies have found that academics who have transferred from disciplinary to education research report feel anxious about how others

perceive them (Flecknoe et al., 2017). In contrast, while some felt that their new role would bring opportunity and perhaps some greater flexibility to explore education theory and research (Flecknoe et al., 2017), transitioning into an education/teaching focus requires crossing an 'identity threshold' (Simmons et al., 2013) which if not crossed can lead to an imposter syndrome in a field where one does not feel that they belong.

Education/teaching focused academic roles have within their role time 20–30% for research. Several academics interviewed commented that they were either swamped by teaching or felt trapped in the expectation that they should spend all their time teaching, a view shared by their colleagues. Interviewees stated:

... a reasonable workload is quite difficult to manage.

Interviewee 8, Level D, Go8

So we've got these teaching people and I want to do my research so we'll just give more of the teaching to them. What else would they be doing anyway?

Interviewee 5, Level D, Go8

For those education/teaching focused academics who successfully crossed the threshold of research paradigms and navigate the journey from disciplinary to education research or scholarship in science, they faced the added challenge of their educational research not being accepted by disciplinary researchers and higher education leaders. Many deans and deputy vice-chancellors questioned the quality of educational research and looked somewhat suspiciously on the rigour and impact.

There's a lot of dross in the education literature.

They are looked at somewhat suspiciously these people who are doing education focused activities.

That scholarship isn't really very rigorous is it? It's not highly valued. It doesn't have a very high impact factor for those journals.

I've also heard that from people who are in that space doing their education research. It's one of their complaints about it, that it is regarded as a softer scholarship than the normal science that we're used to.

... they will be seen to be unfortunately some sort of lesser being.

Interviewee 11, Level E, Go8

Although education/teaching academics will experience some hardships and some difficulty locating a new identity. It is likely that other education/teaching focused academics in this same situation will band together and help each other form that identity. A community is essential in forming a new education/teaching focused identity. Henkel (2005) suggests that

'individuals are both distinctive and socially embedded. However, identities are, first and foremost, shaped and reinforced in and by strong and stable communities and the social processes generated within them.' For an education/teaching focused academic in science there is a substantial change in their research community. Their community is now a network of academics sparsely distributed across the country and across disciplinary boundaries, because education research questions often span disciplines. Several interviewees commented that the educational community contrasted in both structure and location to a disciplinary research community. They described research focused academics as being part of a tribe of like-minded researchers, an 'educational ecosystem' of senior, mid-career and junior academics combined with postdoctoral and postgraduate students.

Yeah, so in the Australian community, there's leadership shown by professors in their research area. That really drives agendas in the community, so whatever my area happens to be and I'm a professor and I get an ARC grant and I get students – students want to come and – and the post docs come and that's the leader. They build up a community around them. Where are those communities in teaching and learning in mathematics?

Interviewee 5, Level D, Go8

I think that's bad because then we're going into this situation ... I'm a big believer in people needing a discipline. Even if they don't use it throughout their whole career they've come from a situation where they've been a discipline researcher because that's really the only way you can review your teaching with what it means to be a discipline expert in that area.

Interviewee 5, Level D, Go8

A community is critical to success because peers and their beliefs and values both support the socialisation process and hindrances as one settles into a new role (Trowler and Knight, 2000) and the established norms of a culture which sits outside the near departmental university constraints (Jawitz, 2007).

With reports (Aoun, 2019; Business Council of Australia, 2017; Price Waterhouse Cooper, 2016) suggesting that the workforce of the future will depend on creative and innovative thinking and more humanics, an academic workforce comprising education/teaching focused roles with the primary responsibility of teaching and influencing our science students, with limited capacity to do research, appears to be heading in the wrong direction.

If universities are to remain places of knowledge creation, where reputation and ranking are based on quality research, then there are dangers in a large community of academics who cannot contribute to the central enterprise of the university. Although valuable for dealing with the thousands of students, if education/teaching focused academics cannot contribute to research discourse then education/teaching focused academics will be seen to be of lesser

value, even when the rhetoric of promotion criteria says different. Interviewees even commented that the academic workforce could become so divided that a ghetto would be formed.

I think that's what people are really scared about where you have a whole bunch of people who just do the teaching and a whole bunch of people who just do the research because we can see how it would go that way.

I think if you do that then you start to create a bit of a ghetto don't you.

Interviewee 5, Level D, Go8

So I think if you're going to have those positions they have to have equivalent status. That's probably never going to happen.

Interviewee 14, Level E, Go8

As Coates and Goedegebuure (2012) state, the current situation presents a range of serious management and educational challenges. Accordingly, we must initiate a robust conversation in universities in search of solutions. The solution is more complex than simply a search to solve the inequalities in promotion and awards and step back from the deep-seated opposition to these roles from within academia (Probert, 2013). Paradoxically, as Probert (2013) also points out, many academic staff have long felt that it is good to recognise education excellence and allow education/teaching focused positions to have equal privilege to research. Many if not all who were interviewed agree with this and commented that universities have an obligation to the student and their learning, and that academics should be valued for their skills. Price Waterhouse Cooper (2016) state:

Redesign of existing roles: a move away from the 40/40/20 workload allocation model, giving academics the scope to flex roles as required and desired (i.e. some may focus exclusively on teaching and learning, to the exclusion of research, or other permutations). This may be implemented to compliment a requirement for increased industry engagement, greater research productivity, enhanced digital acumen, best practice andragogy, and philanthropic endeavours.

(Price Waterhouse Cooper, 2016, p. 34)

and

frameworks should align individual accountabilities to organisational priorities, to support a collaborative, outcomes focused university culture, but also ensure that academics and other staff engaged in new roles and ways of working are not disadvantaged. This increased clarity of performance expectation should extend to casual staff to ensure quality of student experience is upheld across the workforce.

(Price Waterhouse Cooper, 2016, p. 35)

Price Waterhouse Cooper concludes by stating that not all universities need to respond in the same way; there are many possible permutations across schools and disciplines. For science academics to maximise their impact and retain their influence and mobility requires research currency. Science academics become quickly de-skilled and devalued if they move away from research completely. Thus, it is not possible, as many reports suggest, for science academics to move freely from research to education and then back to research, especially on a year to year basis (e.g. moving between blended teaching and research and pure research roles; Price Waterhouse Cooper, 2016). Research currency does not depend on demand but instead on expertise; therefore, academics must maintain a connection to the most current research trends.

We propose that the education/teaching focused academic needs to retain their disciplinary research currency and disciplinary home in some capacity, in order to be agile and of maximum benefit to the university. To do this, a structured peer-support scheme between education/teaching focused and research focused academics would provide ongoing research currency and have the dual benefit of up to date course content. A productive partnership would mean that top researchers in the relevant areas would partner with education/teaching focused academic and teaching teams, therefore ensuring that the subject matter and teaching methods reflect the latest state-of-the-art content. These partnerships will also allow education/teaching focused academics to form closer working ties with researchers, and, where appropriate, collaboration and co-supervision of honours programs etc. can also occur. This will achieve the 'more agile workforce' required by several reports (Business Council of Australia, 2017; Price Waterhouse Cooper, 2016). In essence, such a scheme would represent a university making a commitment to its workforce, and to creating a vibrant, thriving educational ecosystem of academics who are agile, mobile and skilled educators, as well as leading researchers.

Teaching standards and professional development framework

One of the most difficult aspects of being an education/teaching or teaching and research focused academic which all interviewees expressed is navigating the journey of teaching. Many academics start their teaching careers with a focus upon their own performance, with the aim of 'telling the content'. Questions such as 'am I explaining the content properly?', 'was I clear?' and 'how am I performing?' evince a preoccupation with themselves as teachers, rather than the performance of the student. As academics gain experience, however, they do switch their focus from teacher to student (Prosser and Trigwell, 1998), and questions including 'how do I construct the learning experience so that students learn?' and 'did students understand?' reflect this change. Such a characterisation of the teaching journey is described by the criteria and standards of achievement in promotion policies, but these describe summative end points rather than formative signposts in the teaching process. Although formal training would more rapidly occasion a professional shift in focus,

this remains a choice, or perhaps a recommendation, rather than a requirement of any academic role – not even education/teaching focused academic roles.

Unfortunately, many of the teaching frameworks which exist to assist academics describe their teaching have the disadvantage of being lengthy and complex – containing multiple criteria and lengthy standard descriptions dependent on the academic level of promotion. The end result is a repetitive accumulation of end point standard descriptions for each level of the academic role. Although there are now some specific promotion policies for education/teaching focused academics (for example at University of New South Wales), they too describe the end standard to be reached and lack the enablers needed for academics to succeed.

Based on one on one interviews with academics, national interactive workshops with education/teaching focused and teaching and research academics, and a critical analysis of both promotion criteria and a wide diversity of frameworks, a professional development framework containing both standards and enablers has been created for education/teaching focused academics and teaching and research focused academics in higher education. The first part of the professional development framework is a set of quality teaching standards: explicit statements in four main themes – knowledge, practice, scholarship and students – each with three subthemes (Figure 6).

Knowledge includes both disciplinary and pedagogical content knowledge. These subdomains reflect the importance of knowing the subject matter content knowledge, the organisational structures, the pre- and misconceptions of students and pedagogical content knowledge, and the capacity of a teacher to create meaningful learning activities. The knowledge themes emphasise the teacher's role in modelling life-wide learning through formal training in a Graduate Certificate in Higher Education or equivalent accreditation, such as a fellowship process through Advanced HE. The next theme, practice, concerns the capacity to design, deliver and evaluate learning through assessment that is challenging and uses evidence to change practice; it is about being reflective. The third theme, scholarship, is about the commitment of academics to scholarship and research, the creation of learning partnerships with disciplinary, education and industry researchers, and the use of the scholarly literature to inform practice and serve the higher education industry both internally and externally. Finally, the theme of students and student learning encompasses a standard where academics can demonstrate their capacity to create a contemporary, engaging and safe learning environment for all in an 'educational ecosystem' of learning; this includes students, technicians, peers, colleague and enablers such as library staff. This ecosystem is one which builds student rapport and leads to student learning gain, performance, retention and progression. Evidence of effectiveness in each of these themes and subthemes can be extracted from oneself, peers, students and employers.

The second part of the professional evaluative framework is a set of enabling statements (Figure 7). These statements reflect the knowledge, behaviour and characteristics which academics require to reach the standards of quality. They include expertise and research, student centred learning, connections and collaborations, communication, publication and impact, personal effectiveness and reflective practice, innovation, influence and creativity. Used together they form a professional development framework, an explicit set of statements of quality teaching standards and an explicit set of enabling statements to act as signposts on the teaching journey from novice to expert practitioner.

The education/teaching focused role is considered one of the ‘wicked problems’ facing higher education (Adams Becker, 2017). For academics in science, an education/teaching focused role brings the significant challenge of a new research paradigm. This involves a shift from quantitative to qualitative evidence based research, together with a new epistemology and identity. An education/teaching focused role in science requires a reframing of expertise, where an academic starts again as a novice, before creating and growing connections and communities which are characteristically more diffuse and dispersed than disciplinary research networks. Consequently, through productive research partnerships with both education and disciplinary researchers, and personal characteristics such as enthusiasm, integrity, perseverance and resilience, the academic makes the journey from novice to expert in a new disciplinary home – one which still allows for mobility within and between universities.



Figure 6 Standards for quality teaching in an academic role.



Standards

Knowledge

Understand both disciplinary and pedagogical content knowledge. Professional learning in higher education e.g Graduate Certificate in Higher Education, fellowship of Advance HE.

Practice

Capacity to design, deliver and evaluate learning through assessment which is challenging and uses the evidence to change practice; being the reflective practitioner.

Scholarship

Commitment to scholarship and research, the creation of productive partnerships with disciplinary and industry researchers. Access and use of scholarly literature to inform practice.

Students

Capacity to create a contemporary, engaging and safe learning environment for all involved in the learning; students, technicians, peers, colleague and enabling staff such as the library.



Expertise and Research

Universities are places of knowledge creation and expertise. Educational design should be informed by the learning sciences, together with scholarship pertaining to student learning. Education focussed academics need to develop expertise and professional development and training to build expertise in a new educational research paradigm and maintain links to their disciplinary research. This may include strategies which foster productive partnerships with disciplinary and educational researchers.



Student Centered Learning

The safety, well-being and learning of students is the heart of the university enterprise. Education focussed academics must therefore focus on student learning, as well as the creation of a safe and nurturing learning environment. This requires developing a curriculum with opportunities for students to have authentic experiences and to develop work-ready skills.



Connections and Collaboration

Universities are diverse communities where learning is shared as a common interest. Education focussed academics need to create, engage and share educational experiences and practice with their colleagues across the science disciplines, so as to build professional networks internally and externally. This will improve both student learning and educational practice.

Enablers



Communication, Influence and Impact

Communication, both written and oral, is an essential part of academic life. Education focussed academics need to view their role as part of a shared collaborative endeavour to create an "educational ecosystem" where collegiality is valued. They should seek to both mentor and act as mentors for others, including by publishing and communicating practice which influences the perspectives of others.



Personal Effectiveness and Reflective Practice

Effective teachers display personal characteristics such as enthusiasm, integrity, perseverance and resilience. Education focussed academics need to thoughtfully consider their experiences, understand differences in diversity and cultural perspectives of learners, and improve practice through the reflective process.



Innovation and Creativity

Learning in Science is difficult and complex, thus requiring a wide variety of teaching and learning strategies. New technologies are providing opportunities for conceptual understanding and thinking in ways which were previously not possible e.g. mixed and virtual realities. Education focussed academics need to be responsive, open and willing to experiment with new approaches and technologies. They must be prepared to take risks and learn from failure and success alike.

Figure 7 Standards for quality teaching and enablers in an academic role (icons by Maria Zamchy).

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Appendix A

Certification by Deputy Vice-Chancellor (or equivalent)

I certify that all parts of the final report for this OLT fellowship provide an accurate representation of the implementation, impact and findings of the project, and that the report is of publishable quality.

Name: Philippa Pattison
Deputy Vice-Chancellor (Education)
The University of Sydney

Signature: 

Date: 30 April 2019

Appendix B

1. **Appendix B, Table 1.** Questions asked to academics in semi- structured interviews.
2. **Appendix B, Table 2.** Promotion policies and criteria accessed as part of this report.
3. **Appendix B, Table 3.** Presentations on the 'Changing nature of the academic role' at workshops and conferences, 2015– 2019.
4. **Appendix B, Table 4.** Summary of the promotion criteria in common for Australian universities.
5. **Appendix B, Table 5 (a-d).** Sources of evidence of quality teaching.

Appendix B, Table 1. Questions asked to academics in semi-structured interviews between August 2015 and March 2016 (Human Ethics #H11177 Western Sydney University)

Question number	Question
1	With reference to your own university, to what extent is a strong emphasis on disciplinary research and publication?
2	With reference to your own university, to what extent is a strong emphasis on learning and teaching and publication?
3	With reference to your own university describe the extent to which academics focused on learning and teaching are valued? What are the indicators of this?
4	With reference to your own university describe the extent to which the quality of teaching is valued? What metrics are used to provide evidence of value and quality?
5	With reference to your own university, describe the extent to which disciplinary science research is valued? What metrics are used to provide evidence of value and quality?
6	With reference to your academic role, how much time in your role did you spend this semester on teaching, administration and disciplinary science research/scholarship?
7	Describe some of the metrics which should be used to evaluate education focused positions and/or education component of the academic role in science.
8	Should universities appoint academics in education focused positions, separately to disciplinary research? Explain reasoning for your answer
9	Flexibility in the academic role in the sciences is being broadly discussed? To what extent is flexibility possible in the academic role? For example is it possible to move from focus on research, to education and back again? What metrics and/or evidence is used to provide evidence of value and quality?
10	Which source of metrics and/or evidence (i.e. student evaluation, peer evaluation, awards, student progression) do you most value when evaluating the quality of your teaching?
11	What is meant by the scholarship in teaching and learning?
12	Are you published in learning and teaching? If so what value does it add to your role as an academic?
13	What factors are primary in driving your decisions to work in education, research or both? Considering your academic work, how many hours to you spend in a typical week on the following activities a) Teaching b) Research c) Service (unpaid assistance to government agencies or colleagues) d) Administration (unit co-ordination, committee meetings) e) Other (attending conferences, reviews)
14	Considering your academic work, how many hours to you spend in a typical year on the following activities f) Teaching g) Research h) Service (unpaid assistance to government agencies or colleagues) i) Administration (unit co-ordination, committee meetings) j) Other (attending conferences, reviews)

15	<p>Considering promotion and promotion committees which of the following activities is likely to influence the decision</p> <ul style="list-style-type: none"> a) Teaching b) Research c) Service (unpaid assistance to government agencies or colleagues) d) Administration (unit co-ordination, committee meetings) e) Other (attending conferences, reviews)
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Appendix B, Table 2. Promotion policies and criteria accessed as part of this report.

Name of University	Date last accessed	URL
Australian National University	26/03/2019	https://policies.anu.edu.au/ppl/document/ANUP_000624
University of Melbourne	26/03/2019	https://about.unimelb.edu.au/__data/assets/pdf_file/0012/50016/academic-career-benchmarks-indicators.pdf
University of Sydney	26/03/2019	http://sydney.edu.au/provost/pdfs/Guidelines_for_Applicants_2018_FINAL.pdf
University of New South Wales	26/03/2019	https://www.hr.unsw.edu.au/employee/acad/Academic_Expectations_Framework_2017.pdf
University of Queensland	26/03/2019	https://ppl.app.uq.edu.au/content/5.70.17-criteria-academic-performance
Monash University	26/03/2019	https://www.monash.edu/academic-promotion/tools-and-resources/standards
University of Western Australia	26/03/2019	http://www.hr.uwa.edu.au/working/academic/teaching
University of Adelaide	28/03/2019	provided on request
University of Technology Sydney	1/04/2019	provided on request
Macquarie University	26/03/2019	https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/academic-promotion/media111118/documents11111/Criteria-Schedule_Academic-Promotion.pdf
University of South Australia	26/03/2019	http://i.unisa.edu.au/siteassets/human-resources/ptc/files/guidelines/academic-promotion/2018_academic-promotion-guidelines.pdf
University of Tasmania	26/03/2019	http://www.utas.edu.au/__data/assets/pdf_file/0010/987103/7815A-Revised-Teaching-Performance.pdf
Deakin University	26/03/2019	https://policy.deakin.edu.au/download.php?id=512&version=2&associated
Griffith University	26/03/2019	https://policies.griffith.edu.au/pdf/Promotion%20of%20Academic%20Staff%20Procedures.pdf
James Cook University	26/03/2019	https://www.jcu.edu.au/__data/assets/pdf_file/0020/124436/Academic-Promotion-Procedures-v18-1.pdf

La Trobe University	26/03/2019	https://policies.latrobe.edu.au/document/view.php?id=76
Flinders University	26/03/2019	https://www.flinders.edu.au/hr-files/documents/Academic_Profiles_Levels_A_to_E.pdf
Western Sydney University	26/03/2019	https://www.westernsydney.edu.au/tld/home/career_development/academic_promotion
Central Queensland University	26/03/2019	https://www.cqu.edu.au/policy?collection=policy&form=policy&query=profiles
Victoria University	26/03/2019	https://policy.vu.edu.au/download.php?id=237&version=4&associated
Edith Cowan University	27/03/2019	https://intranet.ecu.edu.au/staff/centres/human-resources-service/our-services/performance-recognition-and-career-development/managing-your-performance/related-content/see-also/academic-staff-performance-expectations-and-outcomes-aspoe-framework
University of Southern Queensland	27/03/2019	https://policy.usq.edu.au/documents/1538PL
Australian Catholic University	26/03/2019	https://policies.acu.edu.au/hr/rewards_and_recognition/academic_promotion/academic_promotions_policy
Southern Cross University	26/03/2019	https://www.scu.edu.au/staff/hr-services/recruitment/minimum-standards-for-academic-staff/#a
University of New England	26/03/2019	https://www.une.edu.au/documents/hr/une-academic-and-elc-teaching-staff-collective-agreement-2014-2017/schedules/schedule-5-une-position-classification-standards-academic-staff
University of Sunshine Coast	26/03/2019	https://www.usc.edu.au/explore/policies-and-procedures/academic-promotion-to-level-b-procedures
Charles Sturt University	26/03/2019	https://cdn.csu.edu.au/___data/assets/pdf_file/0010/1355824/The-CSU-Academic-.pdf

Appendix B, Table 3. Presentations on the ‘Changing nature of the academic role’ at workshops and conferences, 2015–2019

Organisation	Date	Location	Title of Presentation	Number of Participants
1. Science and Mathematics Network of Australia University Educators SaMnet	17 th February 2015	Macquarie University, New South Wales	Career Progression: Understanding the System: Evaluating the Academic Role	30
2. Australian Council of Deans of Science Teaching and Learning Conference	16-17 th July 2015	Ship Inn South bank, Brisbane Griffith University	Priorities for Science Learning and Teaching	58
3. Science and Mathematics Network of Australia University Educators SaMnet Educational Leadership and SoTL Workshop Program	9 th June 2015	Griffith University	Career Progression: Understanding the System. Changing Nature the Academic Role in Science	24
4. Australian Conference on Science and Mathematics Education	30 th September-1 st October	Curtin University	Professional Stripping: the Education Focused Academic Role in the Sciences	30
5. International Society for the Scholarship of teaching and Learning (ISSOTL)	27-30 th October 2015	RMIT, Melbourne	Evaluating the Academic Role in the Sciences	Tbc
6. Higher Education Compliance and Quality Network. Higher Education Services Forum	4-5 th November 2015	Park Royal Hotel Melbourne Airport	The changing nature of the academic role in science	Tbc
7. Australian Council of Deans of Environmental Science	18 th February 2015	Western Sydney University, Sydney	Changing nature the Academic Role in the Sciences	~25
8. Australian Council of Deans of Science. First Year in Science and Mathematics	5 th February 2016	University of Sydney, Sydney	Academic Roles, Management and Leadership. Changing academic roles, management and leadership	58

9. Australian Council of Deans of Science. First Year in Science and Mathematics	2 nd February 2016	University of Melbourne	Academic Roles, Management and Leadership. Changing academic roles, management and leadership	41
10. Faculty of Veterinary Science	22 nd March 2016	University of Sydney, Sydney	Australian Council of Deans of Science. First Year in Science and Mathematics	~25
11. Seminar Workshop	23 rd February 2016	University of New South Wales, Sydney	Changing Nature of the Academic Role	~25
12. OLT Conference Learning and Teaching 2030 Collaborating to Shape the Future of Learning and Teaching	28—29 th April 2016	Langham Hotel, Melbourne	Changing Nature of the Academic Role	tbc
13. Australian Conference on Science and Mathematics Education	4 th October 2016	University of Queensland	'Professional Stripping': the Education Focused Academic Role in the Sciences	171
14. Biosciences Education Australia Network Bioscience Education Forum	11-12 th December 2016	Australian National University, Canberra	Panel: The Future of the Academic Role 'Get out there... productive partnerships and the future of academia' where participants will discuss the ever-evolving academic role in the 21C. This is part of an OLT National Teaching Fellowship	76
15. Australian Council of Deans Science Teaching and Learning Conference	19-20 th July 2018	University of Adelaide	Riding the Wave of Changing in the Curriculum and Academic Role in science	47
16. Association for University Professors: What should a university be?	23 rd August 2018	University of Sydney	The Changing Nature of the Academic Role	~150
17. Australian Conference on Science and Mathematics Education	2-4 th October 2019	University of Sydney	Education Focused Academics in science	~200
Total				~960

Appendix B, Table 4. Summary of the promotion criteria in common for Australian universities. The number of times a criterion was used across all universities is given in bold. Only those universities with separate criteria for education/teaching focused or research.

Teaching and Research Academic (nominal)		Education/Teaching focused academic (nominal)		Research focused academic (nominal 80:10:10)	
Teaching core criteria	Research core	Teaching core criteria	Research core	Teaching core criteria	Research core criteria
Leadership in quality teaching and major contributions to the quality of the student experience, student learning and student outcomes that are underpinned by research, scholarship and engagement. 22	Leadership in their field of science/disciplinary research, within their institution, discipline and/or profession and within the scholarly and/or general community. 19	Exhibit strong teaching practice and a scholarly approach to teaching across different settings, resulting in continuous improvement of curriculum, teaching resources and approaches. 5	Dissemination of their work on the scholarship of teaching and learning including publication in high quality peer-reviewed outlets and other mechanisms appropriate for the discipline and target audience. 4	Achieve teaching quality as indicated by approved surveys and outcomes for students. 2	National recognition and a developing international profile for research in the field through publication or exhibition in high quality outlets and, where relevant, by the impact of their research on policy, practice, links with industry, entrepreneurship and/or commercialization. 3

Scholarly publications on teaching, learning, curriculum and assessment (with emphasis on refereed, international and sole or lead author). 19	A strong record of published work within discipline or other demonstrated scholarly activities. 17	Very high to outstanding student feedback or peer evaluation on units. 4	Collaborate in the development of quality teaching projects which explore, test, practice and communicate improved pedagogies. 3	Improve or innovate where appropriate in response to feedback. 1	Contribute as a chief investigator to collaborations which yield new insights and opportunities. 3
Curriculum design and innovation, including cross-disciplinary approaches. 18	Successful supervision Higher Degree by Research students (RHD, HDR). 17	Knowledge of discipline/domain-specific content knowledge and pedagogical content knowledge to collaborate in the development of quality projects which explore, test, practice and communicate improved pedagogies. 4	Presentations on reflections on teaching practice at teaching and learning conferences. 4	Successful supervision Higher Degree by Research students (RHD, HDR). 1	Success in obtaining, sustaining and managing competitive (sometimes specific to ARC Category 1) external grants and funding from industry and other end user partnerships. 2
Very high to outstanding student feedback on units (SFU). Which is used to improve practice and learning. 8	Have a record of success in competitive (sometimes specific to ARC Category 1) external grant applications. 17	Leadership in quality teaching and major contributions to the quality of the student experience, student learning and student outcomes that are underpinned by research, scholarship and engagement. 3	Success in attracting funding to undertake projects that enhance and develop teaching in the discipline. 3		Successful supervision Higher Degree by Research students (RHD, HDR) supervision (completion rates, candidate publications, graduate outcomes and achievements). 2

Effectively coordinates and manages curriculum/programs of study- Course delivery at exemplar level. 9	Major original and innovative contributions to their field of study or research. 11	Demonstrates advanced teaching skills that support student learning, engagement, pedagogies and technology. 2	
Received teaching awards for excellence in education. 8	H index or other citation rate measure (as appropriate to	Devote most of their effort to excellence in, and contribution to, teaching. 2	
Successful supervision Higher Degree by Research students (RHD, HDR). 6		Effectively coordinates and manages curriculum/programs of study- Course delivery at exemplar level. 3	
Gaining competitive internal and external teaching and learning grants that result in improved practice. 5		Establish a Community of Practice, Peer Mentoring, Peer Observation schemes. 1	
Undertakes professional accreditation (SFHEA or equivalent) and/or completion of Graduate Certificate or equivalent in Higher Education. 1		Received teaching awards for excellence in education. 3	
		Undertakes professional accreditation (SFHEA or equivalent) and/or completion of Graduate Certificate or equivalent in Higher Education. 1	

		RHD (HDR) supervision (completion rates, candidate publications, graduate outcomes and achievements). 2	
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Appendix B, Table 5 (a-d). Sources of evidence of quality teaching collected in the four state workshops with 295 participating academics

Appendix B, Table 5a. Sources of evidence of quality teaching as indicated by students in the thematic areas of student learning, student growth and confidence, student retention, student satisfaction, health and wellbeing, and student engagement and attendance by 295 participants in four state workshops. The criteria highlighted in red were raised at all four workshops, in orange were raised in three independent workshops and in blue were raised in two independent workshops. The number of times evidence was raised within a single independent workshop has been indicated by a multiplier alongside the statement.

Students				
Student learning and assessment	Student growth and confidence	Student retention	Student evaluation and feedback	Engagement and attendance
	Improvements in students' generic skills such as critical thinking and problem solving, can be applied to other units x1 x 6	Student retention in subsequent years x4 x2	Student satisfaction and feedback x1 x1 x1 x3	Engagement (however difficult to measure). x1 x3 x1
Evidence of student learning based on improvement in assessment standards x5, x3	Student confidence (self-reporting and in presentations)	How many pursue honours and HDR	Student response on qualitative feedback about a positive experience	Evidence of learning growth x1 x1
Student learning gains (measure what they can do before and after the unit) – diagnostic x5 x2	Student understanding and progression x3 x1		Student health and well being	Student attendance x2
Exam performance and quality of responses to questions, student pass rate x4 x3	Students gaining and applying knowledge in familiar and unfamiliar situations x2		Student social connections	Individual student stories
Assessment design which is aligned with learning outcomes x2			Not student bloody opinions	Student personal growth attributes – but how do we measure this?

Assessment Artefacts (light bulb moments)			Students qualitative comments on evaluation forms, positive and negative	Number of questions students ask
Assess critical thinking and problems solving skills across the semester				Evidence based curriculum development. Created and planned with community including industry and students
				Tracking of metrics on Learning Management Systems x1 x 1

Appendix B, Table 5 b. Criteria identified as indicating evidence of quality teaching as indicated by teachers in the thematic areas of, student satisfaction, health and wellbeing, pedagogy and classroom management, personal skills and organisation, reflection and mentoring, content knowledge, and student improvement by 295 participants in four state workshops. The criteria highlighted in orange were raised in three independent workshops, criteria in blue were raised in two independent workshops. The number of times evidence was raised within a single independent workshop has been indicated by a multiplier.

Teachers					
Student satisfaction, health and wellbeing	Pedagogy and curriculum and unit design	Personal skills and organisation	Reflective Practice and mentoring	Disciplinary content knowledge	Student improvement
Student feedback x1 x1 x3	Well-structured and scaffolded design which caters to a wide diversity of student learning styles x1 x1 x2	Inspiring, passionate and Engaging x2 x1	Reflective teaching – changed in response to feedback x1 x1	Set knowledge in context of research for students x1 x1	
Unsolicited student feedback in emails x1 x1 x2	Course design and delivery which is challenging and yet differentiates to the curriculum for diversity and learning styles and is at an appropriate level x9 x 2	Availability, approachability and attitude x 1 x 3	Justification of design of learning activities by other members of a teaching team x1	Use deep disciplinary knowledge to enhance learning x1 x4	Improvements in student's generic skills such as problem solving and critical thinking x1
Student questions during and after which demonstrate curiosity x2	Sets clear expectations which are articulated in unit outlines, learning guides and actions - delivers on expectations x4	Communicator x3	Mentor provided on how to design and assess learning activities (same department, different department, different university) x1	Create quality learning resources x2	

Teacher effectiveness in providing constructive feedback in a timely and meaningful way linked to the learning outcomes x3	Facilitate a positive learning environment x2	Flexibility x2			
Student teaching award – but unsure if effective as may be popularity contest x1	Course organisation x1	Fairness and consistency x2			
Student relationships, rapport and respect x1		Patience which is infinite – emotional intelligence x1			
		Collaborative and interactive with the teaching team x1			
Student perception of learning x1		Good looking and accent x1			
Student surveys x1		Inspirational and motivational approaches to teaching - coach like approach x1			
Teacher response rate to emails and questions x1					

Appendix B, Table 5 c. Criteria identified as indicting evidence of quality teaching as indicated by peers in the thematic areas of peer review, recognition and awards, scholarship of teaching and learning, and peer relationships by 295 participants in four state workshops. The criteria highlighted in orange were raised in three independent workshops, criteria in blue were raised in two independent workshops. The number of times evidence was raised within a single independent workshop has been indicated by a multiplier.

Peers					
Peer review	Recognition and awards	Scholarship of teaching and learning	Peer relationships		
Peer review and uptake of teaching practice by others x3 x4	Teaching Awards on multiple levels institutional and national x1 x1	Engaged and Published in the Scholarship of Teaching and Learning x1 x2	Builds rapport and interconnections with technical staff and library and other professional x2		
Peer review and evaluation of curriculum material by teaching teams, student and educational designers x5	Invitations to speak about approaches at teaching and learning events x1 x1				
Peer review of learning activities and assessment, which needs to be done by experts for promotion committee to value x1	University wide acknowledgement of teaching skill x2				
Quality of the material used x1	Peer recognition x1				
Peer review of effective teaching x1	Leadership roles in school and faculty x1				
Affecting practice of peers by mentoring x1					
Peer Judgement x1					

Appendix B, Table 5 d. Criteria identified as indicting evidence of quality teaching as indicated by employers in the thematic areas of quality and work readiness by 295 participants in four state workshops. The criteria highlighted in orange were raised in three independent workshops, criteria in blue were raised in two independent workshops. The number of times evidence was raised within a single independent workshop has been indicated by a multiplier.

Employers					
Quality	Work readiness				
Employer opinions on the quality of graduates x1	Work readiness and salary. Graduate Destination Survey x1				
	Meets standards of professional accrediting society x1				

Appendix C

Evaluators Report 1

Professor Janet Macaulay

Chair of the Committee for Education and Training, International Union of Biochemistry and Molecular Biology School of Biomedical Sciences, Monash University, Australia.

Evaluators Report 2

Professor Philip Poronnik

Professor of Biomedical Sciences (Educational Strategy)

School of Medical Sciences, The University of Sydney, Australia.

Evaluation Report of OLT Fellowship. Changing nature the Academic Role in the Sciences by Professor Pauline Ross:

Prepared by Professor Janet Macaulay, School of Biomedical Sciences, Monash University, Australia. April 2019

This fellowship report and the literature recognise that academic roles have, and are going through a period of significant change due to many factors including increased student numbers and related demands and pressures on research and university funding. This fellowship was timely, as the changes to academic roles were not necessarily transparent, systematic nor clearly defined. Openly addressing these changes, issues and uncertainty at the national level was required – which this fellowship has enabled.

The fellowship program had two components (below) both of which were very successfully addressed.

The goals of this fellowship program were to:

- 1. Reconceptualise the academic role in the sciences. Create a dialogue between academic groups from senior leaders in disciplinary researches and the learning and teaching community to define the current and future shape of an academic role in Science and*
- 2. Create an evaluation framework to ensure Australia has excellent academic educators of STEM in the future*

The introduction/background of fellowship report presents a significant depth of collated data from relevant reputable sources. This collated data has enabled a strong, coherent and well discussed foundation on which this fellowship has built, by strengthening the literature, expanding the data/knowledge and providing multiple outputs. The introduction in itself will be a valuable resource for higher education institutions in Australia. This section of the fellowship resulted in Fellowship Outcome 1: *an analysis of the academic role as described in data from the Department of Education and Training, a summary of the description of academic roles as set out in the Enterprise Workload Agreements and what is valued as evidence of quality in the education/teaching focussed academic role as outlined in Promotion Criteria and the learning and teaching community* (OLT Fellowship report).

The methods (qualitative and quantitative) used in the project to gather new data, encompassing individual interviews (32 academics) and workshops (greater than 295 participants), were highly appropriate and successful in generating the desired dialogue between the varied academic groups. The participants interviewed, and engaged in the workshops, provided appropriate representation from the broad range of Higher Education Institutions in Australia in terms of geographical location, university group, gender, academic levels and academic roles. This methodology provided the STEM academic community multiple opportunities to interact openly with each other and to have their voices heard in this important discussion. This strong engagement with the academic community through individual interviews aligned with Fellowship Goal 1: *“Reconceptualise the academic role in the sciences. Create a dialogue between academic groups from senior leaders in disciplinary researches and the learning and teaching community to define the current and future shape of an academic role in Science”* and resulted in Fellowship Outcome 2: *“interviews, insights and understandings on the education/teaching focussed role in*

Science from a range of academics across a range of institutions. This included interviews with senior leaders in disciplinary research and the learning and teaching community” (OLT Fellowship report)

The final stage of the fellowship project resulted in Fellowship Output 3 “*an evaluative framework (professional development framework) and a matrix tool to empower education focussed academics to make an impact in their career and more explicitly enable early to mid-career academics in education focussed roles to evidence their impact and create a career trajectory in Science*”. Visual 1: Standards for quality teaching in an academic role and Visual 2: Standards for quality teaching and enablers in an academic role (OLT Fellowship Report). This was achieved using the Australian specific data collected from the interviews and workshops during the fellowship and the data available from universities and previously published frameworks. The framework provides tools, which can be readily used within Universities as of quality teaching standards (visual 1) and as a professional evaluative framework (visual 2). These will provide multifunctional signposts, which can be employed at all stages of an academic career by academics, supervisors, mentors, educational leaders and promotion committees. They will provide a structure to guide improvement and measure success.

Dissemination among stakeholders is a crucial component of any project. The number of participants engaged in this project through the interviews and workshops has ensured that a great number of academics are already engaged with the topic and are aware of the intended outcomes. Additionally Pauline as already presented the topic of “The Changing Nature of the Academic Role” at 16 formal Workshops and Conferences 2015-2018 to the STEM and Higher Education Community. Hence, there is widespread familiarity with the work being undertaken. Further dissemination and engagement with the academic community at all levels is important to ensure the academic community understands the value and opportunities presented by the framework.

In conclusion the project has achieved its goals and in the process engaged widely with the community and has created a useful practical outcome that should help to address one of the major issues facing universities



Professor Philip Poronnik

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[au](#)

23 April 2019

Evaluation Report “Changing nature the Academic Role in the Sciences” Professor Pauline Ross

As higher education approaches 2020 and beyond, the changing nature of the curriculum and institutional priorities drives ongoing debate on the role and identity of academics. At the same time significant managerial/workforce decisions are being based on outdated EBA models. One reason underpinning this is the lack of any actionable frameworks to assist the decision-making process. There have been some attempts to address this through the work of James and colleagues at Melbourne, but much of this work focusses on the 3 “Rs” reward, recognition and regulation, rather than taking a holistic overview of the depth and breadth of academic roles as they diversify and an appreciation of how the individual academic sees/experiences their relationship with their institution.

From this perspective, the report “Changing Nature the Academic Role in the Sciences” by Professor Pauline Ross is a timely and valuable contribution to the debate. The report is distinctive because it draws on the often-neglected academic voice at the coalface to create a compelling snapshot of current situation and the key concerns. It takes as inspiration the existing scholarship in the area to identify the gaps and frame the broader research question.

The underlying goal of the project was to identify and develop strategies to address the future needs of academics as we enter uncharted waters in higher education. It involved interviews with over 32 Level C-E academics from 10 universities from across the sector and 2 non-university institutions as well as 4 state workshops with 295 participants in group discussions. This dialogue is ongoing and the work has also been presented at 17 conferences and forums to over 960 peers to date. In addition, the report reviewed and summarized 38 (out of 38 Australian public universities) Enterprise Bargaining Agreements 27 promotion policies (out of 38 Australian public universities). Overall, this is a very comprehensive and useful overview that

will be of value to anyone wanting to compare their local context with the national state.

In addition to highlighting the challenges, this project has also created a very thoughtful and comprehensive framework to define the breadth of the current academic roles and what standards might apply. This framework builds on the work of Coates and James to create a set of simple, clear and unified guidelines that can inform discussions around the academic role at every level, from head of department through to VC. The framework is presented in two parts, the first a set of quality teaching standards; explicit statements in four main themes – knowledge, practice, scholarship and students and three sub themes with descriptors. The second part of the framework is a set of enabling statements. Used together they form a professional development framework; an explicit set of statements of quality teaching standards and an explicit set of enabling statements to act as signposts on the teaching journey from novice to expert academic in an education/teaching focused role.

In particular, the evaluative framework (professional development framework) and matrix tool define areas of professional development, in essence a platform for academics to discuss how they see their roles evolving and what kinds of assistance they might need to achieve these goals. It enables education/teaching focused academics to understand how they can an impact in their career and more explicitly, how early to mid-career academics can plan a career trajectory in science, strategically in consultation with their managers.

This report has clearly addressed the goals, achieved the stated outcomes and clearly addressed the stakeholders needs. Through her leadership roles both at the institutional level and national networks and the National Committee for Biomedical Sciences of the Australian Academy of Science there are excellent opportunities to disseminate and share this information with all stakeholders. The next step will be to trial the framework in situ with science faculties.

Overall, this is an outstanding report that will be essential reading for all science academics and their managers. It is likely that it will trigger discussion and revised thinking around how to adapt the academic role into the future.


Philip Poronnik PhD

Appendix D

Workshop Flyer

The Changing Nature of the Academic Role in Science

Conference Poster

The Changing Nature of the Academic Role in Science



Educational change is now the near horizon for universities.

The aim of this National Teaching Fellowship, funded by the Office for Learning and Teaching, is to lead a conversation about the changing nature of the academic role in Science, Technology, Engineering and Mathematics (STEM) disciplines and develop a better understanding of the metrics used to identify educational quality.

SEMINAR SYNOPSIS

You are invited to attend a seminar on the changing nature of the academic role in the sciences.

- Academic roles in STEM which have remained remarkably resilient to change are now differentiating. The value of an academic role, not solely focused on disciplinary research, is gaining credibility.
- While we have well-known metrics which evaluate research, through journal rankings and grant successes, we have less understanding of how to evaluate an academic career in STEM focussed more holistically upon research and education or solely on education.

This seminar will report on conceptions of STEM academics on the perceived value of the educational aspect of an academic role in STEM... It will include excerpts of conversations from academics about metrics, flexibility and mobility between research and education roles in the academy.

BRIEF BIO

Pauline is a Professor of Biology and Education Strategy at Western Sydney University. Pauline has received multiple national and international teaching excellence awards, including an Australian Award for Excellence in University Teaching. Pauline also leads an internationally recognised research group, funded by the Australian Research Council, to determine how marine molluscs will cope with climate change. As an academic who has a dual track record in science research and education, she deeply understands the changing higher education landscape.

WHY THIS MATTERS

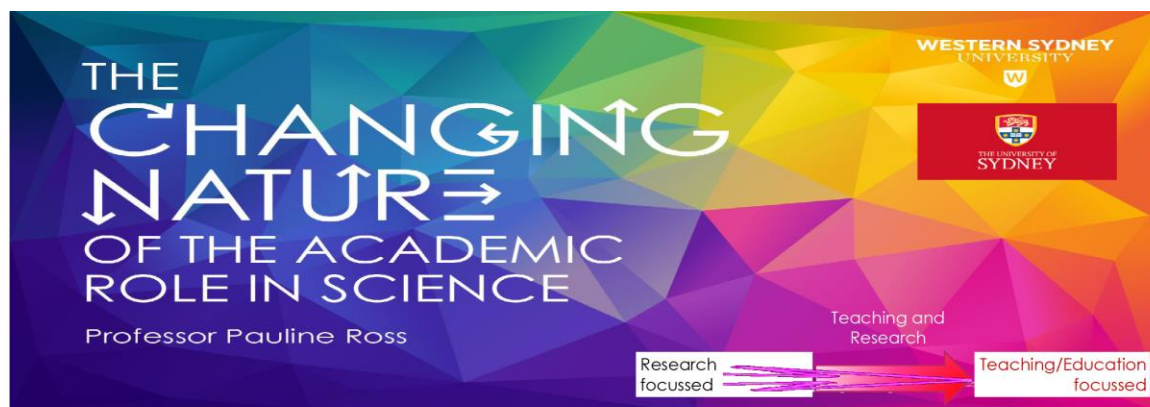
The lack of differentiation in the academic role is being felt acutely in Science, Technology, Engineering and Mathematics (STEM). Declining enrolments and perceived falling standards of graduates, both nationally and internationally, raise concerns about the future pipeline of STEM graduates and a public well-disposed towards science.

There have been national and international calls for profound changes to support and reward the educational aspect of the academic role in STEM to shift an academic culture solely focused on rewarding disciplinary research.

If you would like to schedule a seminar, be part of this study or to request more information, please e-mail Pauline at pm.ross@westernsydney.edu.au



Sponsored by / Funded by or / Supported by the Australian Government Office for Learning and Teaching.



Context

Higher education academics are under pressure to transform. It is reasonable to contend that the current conceptualisation of the academic role based on research no longer meets the educational needs of the higher education environment. The academic role which has been remarkably stretchable needs to change and differentiate.

Differentiation in the academic role is an acute need in the disciplines of Science, Technology, Engineering and Mathematics (STEM), where the pervasive emphasis has been on research. Declining enrolments, perceived falling standards of STEM graduates both nationally and internationally, and priorities of academics raise concerns about the quality of STEM graduates, especially with the modern need for a public who are well disposed towards science.

While we have shared understanding and metrics which evaluate research in terms of journal rankings and grant successes, we have limited understanding and metrics which holistically evaluate the educational aspect of the academic role in STEM.

What evidence do we value when evaluating the educational role in the STEM disciplines?

Method

Over 40 academics in the STEM disciplines, from a variety of universities (ATN, Go8, IRU and regional), were interviewed on what they value when evaluating the educational role in the STEM disciplines. Theme coding of qualitative comments occurred.

STEM academics value evidence about

1. Student learning
2. Leadership
3. Curriculum innovation

"If I had my dream, I would do a pre and post evaluation of our students' learning in some way, so that we could definitely demonstrate that there had been a change in the students".

Go8 Level D

But be careful what you wish for

"We don't generally measure where the students are at the beginning and then where they are at the end. In fact were very poor at that. In fact it might even be shocking if we did it. We might find at the end they do less well than at the beginning. In fact we might find something that we don't really want to know".

Go8 Level E

"Got to have leadership, that means you will be leading programs.. Taken a pedagogy that works, and then 10 or 20 of your colleagues are using it. I want to use your pedagogy".

Go8 Level D

STEM academics value evidence from

1. Students
2. Peers

To convince

"A promotion committee is malleable in the sense of not having to adhere to exactly what's there, so long as you've got good strong evidence". It's a bit like criterion standards with students. I mean sometimes they don't actually match what you see in a quality piece of work".

But

"Even though we now have these education indicators for promotion they are not widely used".

"I think they use the metrics that they know and that's what happened to me, because I wasn't promoted so they used the metrics that they knew and it did not apply to me.....they said they couldn't understand what my intellectual contribution was. I had leadership, I had all the other things coming out, but they couldn't say I had discovered this blah in my individual original contribution".

Go8 Level D

Many academics commented that they were suspicious of evidence and academics focused on education

"They are looked at somewhat suspiciously these people who are doing education-focussed activities".

"That scholarship isn't really very rigorous is it? It's not highly valued. It doesn't have a very high impact factor for those journals".

"I've also heard that from people who are in that space doing their education research. It's one of their complaints about it, that it is regarded as a softer scholarship than the normal science that we're used to".

Go8 Level E

Appendix E

1. Human Ethics Approval
2. Ethics Information Sheet for Participants
3. Participant Consent Form

HUMAN RESEARCH ETHICS COMMITTEE

20 August 2015

Professor Pauline Ross

School of Science and Health

Dear Pauline,

I wish to formally advise you that the Human Research Ethics Committee has approved your research proposal H11177 "Changing nature of the academic role in Science", until 1 July 2016 with the provision of a progress report annually if over 12 months and a final report on completion.

Conditions of Approval

1. A progress report will be due annually on the anniversary of the approval date.
 2. A final report will be due at the expiration of the approval period.
 3. Any amendments to the project must be approved by the Human Research Ethics Committee prior to being implemented. Amendments must be requested using the HREC Amendment Request Form:
http://www.uws.edu.au/_data/assets/pdf_file/0018/491130/HREC_Amendment_Request_Form.pdf
 4. Any serious or unexpected adverse events on participants must be reported to the Human Ethics Committee via the Human Ethics Officer as a matter of priority.
 5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the Committee as a matter of priority
 6. Consent forms are to be retained within the archives of the School or Research Institute and made available to the Committee upon request.
- Please quote the registration number and title as indicated above in the subject line on all future correspondence related to this project. All correspondence should be sent to the email address humanethics@uws.edu.au.

This protocol covers the following researchers:

Pauline Ross

Yours sincerely



Professor Elizabeth Deane
Presiding Member, Human Researcher Ethics Committee

School of Science and
Health University of
Western Sydney Locked Bag
1797 Penrith NSW 2751
Australia
Telephone: 02 45 701306
e-mail: pm.ross@uws.edu.au



Participant Information Sheet (General)

Project Title: The Changing Nature of the
Academic Role in Science

Project Summary:

The lack of differentiation in the academic role is being felt acutely by the Science, Technology, Engineering and Mathematics disciplines (STEM) where the pervasive emphasis has been on research. Declining enrolments and perceived falling standards of STEM graduates, both nationally and internationally, raise concerns about the future pipeline of STEM graduates and a public who are well disposed towards science. Even leading science journals such as Nature and Science are questioning the culture of the academy in science which dichotomises research from education and university cultures which do not adequately support or reward academics focussed on education. Each journal reflects calls for profound change from a well-established academic culture which rewards research over teaching, stating research and teaching need to no longer be in competition, but should be mutually beneficial activities; and academic role needs to be about generating new knowledge through research and educating a new generation.

Whereas the evaluation of research is well established with journal rankings and grant successes, the evaluation of academic careers focussed on education is less established, especially in the sciences where research has been absolute.

The aim of this study is to measure what matters in an academic role focussed on education and create a framework to evaluate a broader suite of academic roles in the sciences.

To do this similarities and differences in perspective of academics in research focused, education focused

and research and education focused roles will be explored in different types of Australian universities;

those within the group of eight, ATN universities, new universities and other pre 1987 universities. It is predicted that what matters in an academic role in the sciences will be dependent on the type of university and this understanding will better inform a holistic evaluative framework.

You are invited to participate in a study conducted by Pauline Ross, Professor of Biology and Education Strategy in the School of Science and Health, University of Western Sydney

How is this study being paid for?

The study is being sponsored by the Office for Learning and teaching through a National Teaching Fellowship

What will I be asked to do?

Participate in an audio taped interview

How much of my time will I need to give?

20-30 minutes

What specific benefits will I receive for participating?

The academic role in the Sciences is differentiating. Academics are finding less time for research and want to move more flexibly between research and education. By participating in this research you will assist in the creation of a framework which better evaluates the education component of the academic role. Such a framework will provide a guidelines to evaluate the academic role.

Will the study involve any discomfort for me? If so, what will you do to rectify it.

Immediately inform the interviewer. All audio taping will be destroyed and there will be no implications for current or future relationships.

How do you intend on publishing the results.

Please be assured that only the researchers will have access to the raw data you provide.

The findings of the research will be published in Higher Education journals and in the form of a report published on the OLT or equivalent web site.

Please note that the minimum retention period for data collection is five years.

Can I withdraw from the study?

Participation is entirely voluntary: and you are not obliged to be involved. If you do participate, you can withdraw at any time without giving any reason.

If you do choose to withdraw, any information that you have supplied will be destroyed.

Can I tell other people about the study?

Yes, you can tell other people about the study by providing them with the chief investigator's contact details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

What if I require further information?

Please contact Professor Pauline Ross should you wish to discuss the research further before deciding whether or not to participate.

Pauline Ross
Professor of Biology and
Education Strategy
Phone 02 45701306
Mobile: 0419285386
e-mail: pm.ross@uws.edu.au

What if I have a complaint?

This study has been approved by the University of Western Sydney Human Research Ethics Committee.

The Approval number is [enter approval number]

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Office of Research Services on Tel +61 2 4736 0229 Fax +61 2 4736 0013 or email humanethics@uws.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree to participate in this study, you may be asked to sign the Participant Consent Form.

Participant Consent Form

Project Title: The Changing Nature of the Academic Role in Science

I, _____, consent to participate in the research project titled The Changing Nature of the Academic Role in Science.

I acknowledge that:

I have read the participant information sheet [or where appropriate, have had read to me] and have been given the opportunity to discuss the information and my involvement in the project with the researcher/s.

The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I consent to answer the demographic questions and the audio taping of the interview.

I understand that my involvement is confidential and that the information gained during the study may be published but no information about me will be used in any way that reveals my identity.

I understand that I can withdraw from the study at any time, without affecting my relationship with the researcher/s now or in the future.

Signed: _____

Name: _____

Date: _____

Return Address:

Locked Bag 1979, Hawkesbury K12, University of Western Sydney, Penrith South DC 2751.

This study has been approved by the University of Western Sydney Human Research Ethics Committee.

The Approval number is: H11177

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Office of Research Services on Tel +61 2 4736 0229 Fax +61 2 4736 0013 or email humanethics@uws.edu.au. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix F

A Summary of the UK Teaching Excellence Framework (TEF)

TEF – The Teaching Excellence Framework; A summary

Brief - The TEF was established in the UK as a multi-purpose instrument aiming to increase accountability and drive improvement in the teaching provided by higher education institutions (HEIs) in the UK. This was to be achieved by providing performance feedback to inform applicant choices and raising the importance of teaching and learning within HEIs. The TEF comprised three components: teaching quality, including student satisfaction; the institutional environment in which students learn; and student outcomes, including the performance of under-represented groups. HEIs were awarded a Gold, Silver or Bronze award depending on these criteria.

Background - In 2013, 2014 and 2015 a series of reports recommended that teaching in European universities was currently undervalued, and not represented in current systems of university rankings. Therefore, 'The development of a commonly accepted 'framework for excellence' would provide a basis for a more strategic approach to quality improvement, allowing institutions to measure their performance against defined criteria and facilitating the comparative analysis of institutional performance as an alternative to league tables and rankings (Brusoni et al. 2014, p. 37)'.

The TEF was developed to encompass the full breadth of the teaching mission, which was determined to comprise of three components: Teaching Quality, Learning Environment, and Student Outcomes and Learning Gain (See supplementary table for full explanation of these criteria). Assessments are made against the criteria, based on both core and split metrics supplemented by a written submission; and carried out by assessors and panellists, comprised of experts in teaching and learning, widening participation specialists, students and employer representatives.

Results - The first TEF results provided a hierarchy of HEIs that varied considerably from those hierarchy previously created based on research outcomes. The complete focus on the teaching mission removed the advantage enjoyed by the longest established universities, with their income and esteem derived from research. Of the 295 participating providers, 134 were HEIs, 106 were further education colleges offering higher education, and 55 were alternative providers (not directly receiving public funding). On this new 'level teaching playing field', 60 higher education providers were rated Gold, 115 Silver, 53 Bronze and 65 Provisional.

Discussion - The TEF is not without critics; some argue that the assessment method of a small panel of experts is flawed (Gibbs, 2017). While others argue that measuring retention, employment outcomes and student satisfaction does not assess teaching excellence (Rust, 2017). These arguments and other critics follow a common theme; that the TEF measures teaching quality through proxies, and this will always be a flaw (Gunn, 2018). While these arguments may be valid, they need to be weighed against the fact that the TEF is not only a measurement tool, but also a transparency tool with an aim to influence HEIs.

It is currently too early to determine if the TEF has achieved its goals of raising the standard of teaching in HEIs, however there is some evidence that the presence of a high profile national evaluation programme has raised the perceived importance of teaching within the academy, and, crucially, among university leaders and strategic planners (Gunn, 2018). Moreover, research by Universities UK (2017) found many leadership teams were paying more attention to core TEF metrics and monitoring their performance to track student success.

When considering implementing a framework such as the TEF, a balance needs to be reached between the state acting as industry regulator in the interests of education consumers (the

public) and the academic freedom of HEIs. When considering that Australia already has a similar framework in the research sector, it is likely that this balance could be struck in the teaching sectors. The suitability of the TEF as a benchmark model for other systems in the EHEA will depend on a number of factors, including: the extent to which there is a perceived need to improve product information and/or teaching quality; the presence and scope for competition in the sector; and the maturity of the quality assurance arrangements in a given higher education system (Gunn, 2018).

Official descriptors of the three TEF criteria; taken from Gunn (2018).

Teaching Quality (TQ)	Includes different forms of structured learning that can involve teachers and academic or specialist support staff. This includes seminars, tutorials, project supervision, laboratory sessions, studio time, placements, supervised on-line learning, workshops, fieldwork and site visits. The emphasis is on teaching that provides an appropriate level of contact, stimulation and challenge, and which encourages student engagement and effort. The effectiveness of course design, and assessment and feedback, in developing students' knowledge, skills and understanding are also considered. The extent to which a provider recognises, encourages and rewards excellent teaching is also included in this aspect.
Learning Environment (LE)	Includes the effectiveness of resources such as libraries, laboratories and design studios, work experience, opportunities for peer-to-peer interaction and extra-curricular activities in supporting students' learning and the development of independent study and research skills. The emphasis is on a personalised academic experience which maximises retention, progression and attainment. The extent to which beneficial linkages are made for students between teaching and learning, and scholarship, research or professional practice (one or more of these) is also considered.
Student Outcomes (SO)	Is focused on the achievement of positive outcomes. Positive outcomes are taken to include: <ul style="list-style-type: none"> • acquisition of attributes such as lifelong learning skills and others that allow a graduate to make a strong contribution to society, economy and the environment, • progression to further study, acquisition of knowledge, skills and attributes necessary to compete for a graduate level job that requires the high level of skills arising from higher education (Universities UK, 2017, p. 19).

Evidence;

The TEF is focused on *outcomes* NOT *outputs*. For example; to measure excellence, rather than measuring the number of graduates which is an *output*, the TEF aims to measure the skills and attributes of those graduates, which is an *outcome*.

Table of criteria and evidence from DfE (2017)

Aspect of Quality <i>Areas of teaching and learning quality</i>	Teaching Quality (TQ)	Learning Environment (LE)	Student Outcomes and Learning Gain (SO)
Criteria <i>Statements against which assessors will make judgements</i>	Teaching Quality criteria	Learning Environment criteria	Student Outcomes and Learning Gain criteria
Evidence	Core metrics		
	<ul style="list-style-type: none"> Teaching on my course (NSS scale 1) Assessment and feedback (NSS scale 2) 	<ul style="list-style-type: none"> Academic support (NSS scale 3) Non-continuation (HESA) 	<ul style="list-style-type: none"> Employment/further study (DLHE) Highly skilled employment/further study (DLHE)
	Split metrics		
	Additional evidence (provider submission)		
Statement of findings <i>Why a particular rating was awarded</i>	Brief description of why a particular rating was awarded including particular strengths		
Overall outcome <i>TEF rating</i>	The level awarded		

Three metrics were used in the original TEF, this data was obtained from **existing sources** which were;

1. The *National Student Survey (NSS)*, which is used to measure the teaching quality, assessment and feedback provision, and academic support.
2. The non-continuation data from the *Higher Education Statistics Agency (HESA)*.
3. The number of graduates in employment/further study or highly skilled employment/further study from the *Destination of Leavers from Higher Education Survey (DLHE)*.

‘TEF results are not simply calculated by the metrics; each provider makes a written submission. A panel of peers and experts is responsible for reviewing the judgements made by TEF assessors, and making a decision on the submission as a whole. This determines whether the provider will receive a Gold, Silver or Bronze award. Student assessors play a full and constructive role in the assessment process’ (Gunn 2018).

Detailed Evidence; (source:

<https://webarchive.nationalarchives.gov.uk/20170517113229/https://www.gov.uk/government/publications/teaching-excellence-framework-year-2-specification>

Possible examples of evidence for each aspect

Aspect	Possible examples of evidence
Teaching Quality (TQ)	<ul style="list-style-type: none">• Impact and effectiveness of involving students in teaching evaluation e.g. collecting and acting on their feedback• Impact and effectiveness of schemes focused on monitoring and maximising students' engagement with their studies such as the UK Engagement Survey (UKES) and others• Recognition of courses by professional, statutory and regulatory bodies (PSRBs)• How the provider is achieving positive outcomes for students, while also successfully identifying, addressing and preventing grade inflation• Quantitative information on teaching intensity, such as weighted contact hours• Impact and effectiveness of external examining• Impact and effectiveness of teaching observation schemes• Impact and effectiveness of innovative approaches, new technology or educational research• Recognition and reward schemes, and their impact and effectiveness, including progression and promotion opportunities for staff based on teaching commitment and performance• Quantitative information relating to the qualification, experience and contractual basis of staff who teach• Impact and effectiveness of feedback initiatives aimed at supporting students' development,

Learning Environment (LE)	<ul style="list-style-type: none"> • Impact and effectiveness of initiatives aimed at supporting the transition into and through a higher education course • Quantitative information demonstrating proportional investment in teaching and learning infrastructure • Use and effectiveness of learner analytics in tracking and monitoring progress and development • Extent, nature and impact of employer engagement in course design and/or delivery, including degree apprenticeships • Extent and impact of student involvement in or exposure to the latest developments in research, scholarship or professional practice (one or more) • (For relevant providers) Evidence of Welsh medium provision contributing to students' academic experiences • Impact and effectiveness of initiatives aimed at understanding, assessing and improving retention and completion
Student Outcomes and Learning Gain (SO)	<ul style="list-style-type: none"> • Learning gain and distance-travelled by all students including those entering higher education part-way through their professional lives • Career enhancement and progression for mature students • Evidence of longer-term employment outcomes and progression of graduates including into highly skilled employment • Evidence and impact of initiatives aimed at preparing students for further study and research • Evidence and impact of initiatives aimed at graduate employability • Extent of student involvement in enterprise and entrepreneurship • Number, impact and success of graduate start-ups • Use and effectiveness of initiatives used to help measure and record student progress, such as Grade Point Average (GPA) <p>Impact of initiatives aimed at closing gaps in development, attainment and progression for students from different backgrounds, in particular those from disadvantaged backgrounds or those who are at greater risk of not achieving positive outcomes.</p>

Future;

The original TEF was somewhat controversial, to try and quell some concerns that were raised, the TEF will include four new metrics in the future. These include (summarised from Gunn, 2018);

1. *Learning Gain*, which seeks 'to measure the improvement in knowledge, skills, work readiness and personal development made by students during their time spent in higher education' (Higher Education Funding Council for England, 2017).
2. *Teaching Intensity*, to assess the contact hours students receive, including the class sizes in which they are taught (Johnson, 2017[a](#)). This addresses the longstanding issue of there being a large variation in contact hours across the sector, yet no comparable data are available to inform student choice.
3. *LEO* (Longitudinal Educational Outcomes), which shows the earnings of graduates one, three and five years after graduation for all subjects and universities (Department for Education, 2017).
4. a metric will be added to measure *Grade Inflation* (Johnson, 2017b).

An institution is awarded:



Gold for delivering consistently outstanding teaching, learning and outcomes for its students. It is of the highest quality found in the UK.



Silver for delivering high-quality teaching, learning and outcomes for its students. It consistently exceeds rigorous national quality requirements for UK higher education.



Bronze for delivering teaching, learning and outcomes for its students that meet rigorous national quality requirements for UK higher education.



Provisional Institutions that meet rigorous national quality requirements but do not yet have enough data to be fully assessed can opt in for a Provisional award.