Transforming graduate capabilities & achievement standards for a sustainable future

Key insights from a 2014-16 Office for Learning & Teaching National Senior Teaching Fellowship

May 2016

Emeritus Professor Geoff Scott, University of Western Sydney
2014-15 National Senior Teaching Fellowship, Office for Learning and Teaching

Support for this fellowship paper has been provided by the Australian Government Office for Learning and Teaching. The views expressed in it do not necessarily reflect the views of the Australian Government Office for Learning and Teaching.

Overview

> The starting point for any discussion of the quality of higher education is the quality and relevance of its purposes. Assessing the quality of higher education according to the extent to which it achieves its purposes – i.e. assessing its fitness *for* purpose without assessing fitness *of* purpose - equates quality with efficiency and is therefore of limited value.
>
> Stephenson, J (1992: 2)[i]

This paper brings together the outcomes from workshops and interviews undertaken with some 3700 Pro Vice-Chancellors, Provosts, Deans, Associate Deans (Learning and Teaching), Heads of Department and Program, and Directors of Learning and Teaching (L&T) along with a range of employer and professional groups as part of a 2014-16 Australian Office for Learning and Teaching National Senior Teaching Fellowship. The Fellowship explored how best to assure the achievement standards and quality of assessment in higher education and the collaborators have come from some 154 universities and colleges in Europe, the UK, the US, Canada, New Zealand, the University of the South Pacific, Malaysia and from every state and territory in Australia.

The focus around the world is now increasingly on assuring the quality of the outcomes and impact of our universities and colleges, not just of the inputs. In particular, there is growing interest in making sure that graduates emerge from higher education with the capabilities and competencies that will equip them not only to be 'work ready' for today but also 'work ready *plus*' for tomorrow. It is universities and colleges that help shape the vast majority of our political and change leaders and create many of the social, cultural, technical, economic and

environmental solutions that ensure we have a sustainable future. This Fellowship has taken the perspective that it is no good to be assessing effectively, efficiently and reliably if what we are assessing in our higher education institutions doesn't count, is irrelevant, unproductive, has limited benefit or is undesirable.

In giving focus to this issue we are led to look more carefully at exactly how program level outcomes are determined in our institutions of higher education, at the robustness of the graduate capability framework being used to profile the learning outcomes to be achieved, at what reference points, sources, criteria, processes and validation evidence are considered in this process and at who is and should be involved when the desired outcomes for the graduates of each degree are established[ii].

The Fellowship has confirmed that, to assure the achievement standards and the quality of assessment in the contemporary university, we must start, therefore, by first confirming the quality (relevance and desirability) of *what* is being assessed. This requires us to confirm the fitness *of* purpose of assessment before looking at *how* well we are assessing (before looking, for example, at the fitness-for-purpose of assessment tasks, the effectiveness with which program level outcomes have been mapped to units, at the quality of grading and calibration, at assuring the overall integrity of the process, minimising plagiarism, using assessment for learning not just of learning, and so on). Those involved have confirmed that it is the optimum combination of the right 'what' and the right 'how' of assessment that is fundamental to assuring the quality of our graduates and the sector's achievement standards.

A complementary focus of the Fellowship has been on identifying what is necessary to build the capacity of those local leaders who are the key arbiters of whether any desired improvements in this area are effectively embraced, implemented and sustained – people in roles like Program leader, Associate Dean (Learning and Teaching) Head of School or Department and Director of Learning and Teaching. We know from our studies of *Learning Leaders in Times of Change* (Scott, et al 2008) and *Turnaround Leadership for Sustainability in Higher Education* (Scott et al, 2012) that, if these players do not effectively engage with and support all their staff, not just the enthusiasts, in learning how to action desired improvements in the design, delivery or assessment of a learning program, there will be no change in practice or consequent benefit realised for students and our nations.

There are two observations derived from 40 years' research and experience with effective change leadership in higher education[iii] that summarise the overall approach taken in the Fellowship and which underpin the insights generated:

> *Good ideas with no ideas on how to implement them are wasted ideas*
> and
> *Change doesn't just happen but must be led, and deftly.*
>
> Fullan & Scott, 2009.

Context

Building on the extensive work already undertaken in this area

Extensive work has been undertaken in earlier Office for Learning and Teaching (OLT) and Australian Learning and Teaching Council (ALTC) projects and fellowships and in other sector initiatives on assuring the quality of assessment in Australian higher education. These have often given particular attention to assuring the fitness for purpose of assessment, assessment integrity and the use of assessment for learning not just of learning.

One body of work has concentrated on establishing guiding principles for enhancing assessment practices, the effective use of assessment to improve learning during and after courses and achieving better alignment between assessment, program design, learning and teaching, along with the inclusion of additional dimensions like global citizenship in assessment and identifying the optimum ways in which to assess graduate attributes.

A second group of projects has concentrated on developing cross-institutional mechanisms for assuring reliable grading, including a range of moderation and calibration schemes, electronic marking and feedback systems, and strategies for assuring academic integrity. A third cluster has developed and tested new assessment tools. A fourth group has explored capacity development for staff and students on assessment.

All of these important initiatives have concentrated predominantly on ***how*** assessment might best be used and delivered. That is, they are mainly concerned with the processes of assessment and its support.

Increased focus on assuring the fitness <u>of</u> purpose of what is being assessed

However, less work has been undertaken to explore whether the outcomes set down for university learning and assessment are, in the first place, relevant and desirable, that is to determining ***what*** assessment in different fields of education should be giving focus to in the context of the rapidly changing needs of the 21st century; or to determining whose voice and what reference-points should be given most/least attention when seeking to ensure that the capabilities and competencies to be developed by our students are what is needed for productive professional performance and societal participation in the new, highly volatile, digitally disrupted global context[iv].

Looking more closely at the fitness *of* purpose of assessment and at what exactly our higher education students are achieving that is of value from their higher education studies has periodically been given emphasis over the past 30 years. For example, in the 1980s the influential U.S. higher educator Ernest Boyer noted that:

> Throughout our study (of 29 US higher education institutions) we were impressed that what today's college is teaching most successfully is competence – competence in meeting schedules, in gathering information, in responding well on tests, in mastering the details of a special field …
>
> But technical skill, of whatever, kind, leaves open essential questions: Education for what purpose? Competence to what end? At a time in life when values should be shaped and personal priorities sharply probed, what a tragedy it would be if the most deeply felt issues, the

most haunting questions, the most creative moments were pushed to the fringes of our institutional life.

Ernest Boyer (1987) pg 283

A decade later David Boud, a key figure in Australian higher education learning, teaching and assessment, observed in 1998:

… a remedy for the crude instrumentalism which has begun to gnaw at the edges of higher education and which for a time dominated discussions of competence… capability shifts consideration to the most important question of all: what sort of learning do we need to promote in higher education to equip us for the future?

David Boud in Stephenson & Yorke (1998: p viii)

Assuring the quality of the outcomes of higher education and our graduates has recently seen a resurgence of interest as governments around the world give increasing focus to confirming that their massive investments in the sector over the past three decades and the opening up of access to tertiary studies are delivering 'value for money'. And, in a context where there is growing diversity in participation in higher education, in what is studied, how it is learnt and assessed, and in when, where and why this takes place it has been observed that:

"… student learning outcomes might come to provide the ultimate test and safeguard for standards"

Richard James (2003).

Recently, through the work of the United Nations University – IAS and the United Nations' Decade of Education for Sustainable Development 2005-14 there has also been increased interest across member nations in ensuring that graduates develop the capabilities that will most help to assure the social, cultural, economic and environmental sustainability of our world.

Australia's Higher Education Standards Panel, starting with its sector discussion paper in March 2013 has, like equivalent agencies around the world, given emphasis not only to the assuring the standard and quality of the inputs to higher education (curriculum, teaching, support, facilities, governance and administration) but also to the quality and focus of its outcomes and its impact, in particular to the quality of its graduates, and to the validity and reliability of their assessment.

In the UK, the Quality Assurance Agency, in its code of practice on safeguarding academic standards and quality (2016, Part B1 pgs 12-13), requires that:

'Higher education providers make use of reference points and expertise from outside the programme in programme design and in their processes for programme development and approval…

Relevant reference points include the national frameworks for higher education qualifications and credit … Subject Benchmark Statements and the requirements of professional, statutory and regulatory bodies. … (along with)… academic staff within the higher education provider, … staff from other higher education providers, contacts made through partnerships … academic subject associations and the Higher Education Academy… representatives of professional, statutory and regulatory bodies … external examiners … employers, … organisations in the communities with which the higher education provider works … representatives from the delivery organisation or support providers…former students and/or students studying in cognate areas.

Parallel attention is now being given to assuring the relevance and quality of graduates in developing countries. For example Sir John Daniel, former president of the Commonwealth of Learning, observes in his introduction to the national handbook for India on Quality Assurance in Higher Education:

> 'Many countries are debating whether their tertiary education systems are indeed … providing the education and training that students and society need.... For India today, quality in higher education is a key priority.'
>
> National Assessment & Accreditation Council (2006: pg iii)

A range of other international commentators and higher education leaders have mounted a robust case for giving much closer attention to assuring the fitness of purpose of our higher education programs[v].

Core themes and insights emerging from the Fellowship

Take into account the world students now enter

> Universities Australia Chair Professor Barney Glover said, with our country embarking on a dramatic transition, universities will be the engine of Australia's innovation, future growth and prosperity…. "Australia is in the early stages of a period of seismic change; change at a pace and magnitude not seen since the industrial revolution," Professor Glover said.
>
> Universities Australia '*Keep it clever'* press release, 7 Oct 2015

Students graduate into a transdisciplinary world not a monodisciplinary one; a world of continuous flux, where technical and human factors constantly interact in complex and unique ways. It is a world where unpredictability and change are always in the air and our graduates' capability is most tested when the unexpected happens, an unanticipated opportunity arises, when things suddenly go awry or they are faced with a 'wicked problem' or dilemma (Rittel & Webber, M, 1973) – a 'forked road' situation in which there is a range of potentially relevant ways to go and they have to decide which is likely to be the most productive.

Yet many universities and colleges still tend to have structures, curricula and assessment approaches that operate in isolation from each other and emphasise specific disciplinary knowledge, skills and boundaries.

As Michael Barber and the team that produced the March 2013 position paper: 'An Avalanche is coming: higher education and the revolution ahead' emphasise:

> "Given the state of the global economy, tensions in international relations, massive gaps between wealth and poverty, the deepening threat of climate change and the ubiquity of weapons of mass destruction, our contention is that we need a generation better educated, in the broadest and most profound sense of that word, than ever before (pg 3)... The models of higher education that marched triumphantly across the globe in the second half of the 20th century are broken (pg 5)... thanks to the inadequacy of outcome measures for universities... (and where) input measures tend to be seen as proxies for quality. (pg 13)".

And as Flores & Gray (2000: 40) observed more than a decade earlier:

> … our traditional educational practices are failing to equip people for the world in which they

will have to live. Our current educational, vocational and corporate cultures orient people to become takers of requests who solve problems. They presuppose a world in which givers and takers of requests fall into neat categories, and problems come to us already defined.

Develop the graduate and professional capabilities that count

To negotiate these challenging moments effectively studies over the last decade with successful early career graduates in 9 professions (see References), along with the feedback from the learning leaders and other stakeholders who have reviewed this work during the current Fellowship, confirm that professional practitioners in today's context need to possess:

- not only an up-to-date and relevant repertoire of generic and role-specific skills and knowledge upon which to draw (the primary focus of many current higher education learning and assessment programs)

  but also

- a mutually reinforcing set of personal, interpersonal and cognitive capabilities which enables them to face situations of uncertainty with equanimity and, as David Hunt (1987) puts it, to accurately 'read' the unique mix of technical and human issues embedded in what is going on and then 'match' the most uniquely appropriate response.

This interlaced set of capabilities includes the ability to manage themselves, remain calm, face and learn from errors, to tolerate ambiguity, to persevere, keep perspective, apply themselves with commitment, and take a hard decision; whilst simultaneously being able to listen to and engage productively with the other players from diverse backgrounds who will be involved in implementing the agreed response. It also includes the ability to concurrently and accurately diagnose ('read') what is going on and, from this, decide if the situation must be addressed or can be passed over.

For those situations they conclude do require attention, capable practitioners then need to be able to accurately identify and trace out the consequences of different apparently suitable courses of action in order to fix upon the option most likely to be effective and identify and implement the right mix of skills and knowledge to match the jointly determined diagnosis of what might best be done

Then, knowing that, in the real world, 'all rising to a great place is by a winding stair' (Francis Bacon, 1625), they need the ability to:

- Deftly and responsively deliver their chosen way of proceeding in partnership with the other relevant players;
- Adjust and refine their plan of action in the light of what happens during initial implementation and
- Maintain team focus, commitment, learning and support.

Use a comprehensive, validated professional & graduate capability framework

The learning and teaching leaders involved in the Fellowship have repeatedly noted, however, that, at present, we lack a shared, proven, validated and comprehensive professional and graduate capability framework which:

- accommodates all of the above dimensions and can be used with a wide range of stakeholders and reference groups to ensure that their advice on the most relevant capabilities and competencies and the most desirable program-level learning outcomes for graduates in each profession/ discipline is considered, evidence-based and comprehensive;
  and which:
- ensures informants' tacit knowledge of what graduates might need in each of the above areas is made explicit, operational and actionable so that it can be effectively addressed in our higher education learning and assessment systems.

Without such a framework and systematic guidance on what to look for when seeking to identify the most relevant and desirable program (degree) level outcomes – outcomes suited not only to meet the needs of today but of the future - we run the risk, when seeking feedback from key stakeholders like employers, of them finding it difficult to surface their 'tacit' knowledge in ways that can be acted upon in the curriculum and assessment and, instead, having to fall back on "their own lay theories of what makes for a good hire and .. (using)... themselves as models of merit" (Rivera, 2015).

During the Fellowship a professional and graduate capability framework that addresses this issue has been tested and validated. It is based on a triangulation of data from: our studies of successful early career graduates during their first three to five years of practice in a wide range of professions; a field test with employers; an analysis of 280,000 'best aspect' and 'needs improvement' comments on Australia's national course experience questionnaire (Scott, 2006); and benchmarking with the empirical work of people like Dan Goleman (1998) and Chade-Meng Tan (2012).

This framework is summarised below in Diagram One, with Table One identifying the subscales the make up the framework. It is comprised of 5 interlocking dimensions and 10 subscales, each with a set of operationally clear, user-validated items. Attachment One discusses the framework in more detail, identifies the validated items that make up the subscales and explains the important distinction we make between 'capability' and 'competence'.

Diagram One

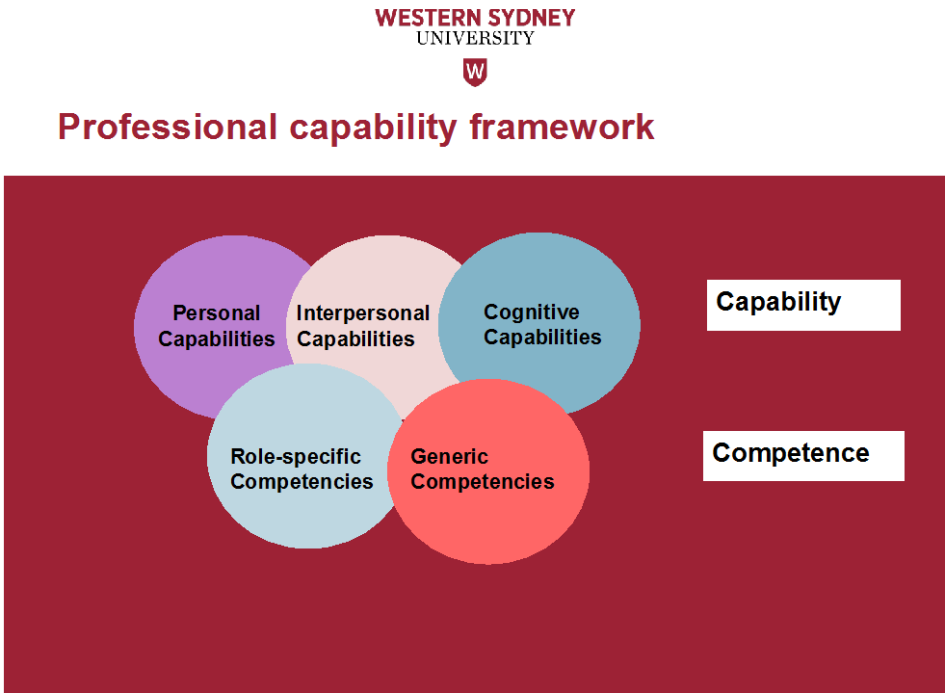


Table One
Professional Capability Dimensions & Sub-scales

Component	Dimension	Subscale
Capability	Personal	Self awareness & regulation Decisiveness Commitment
	Interpersonal	Influencing Empathising
	Cognitive	Diagnosis Strategy Flexibility & responsiveness
Competence	Generic	Transferable skills & Knowledge
	Role or discipline specific	Skills & knowledge necessary for effective role practice in the specific discipline or profession

When seeking to assure the quality of the outcomes of each higher education program, it is recommended that consideration is given to all of the dimensions and subscales above and to the validated items in Attachment One that make

them up. This, say the Fellowship participants, will help ensure that our graduates not only have the competencies (skills and knowledge) necessary for them to be work ready for today but also the personal, interpersonal and cognitive capabilities necessary for them to be work ready *plus* for tomorrow. And this will, in turn, help ensure that what the graduates of our universities emerge being able to do is not only of demonstrable value for them individually but also for the nation's future and its social, cultural, economic and environmental sustainability.

Emphasise the development of graduates who are work ready plus

" To reshape action in the future you must reshape thinking in the present"
Doug Parkin UK Leadership Foundation for HE (2014)

Participants in the Fellowship workshops and meetings particularly liked the notion of developing graduates who are not only work ready for today but who are also work ready *plus* for tomorrow. This, they say, is because it reminds us that we need professionals who not only possess the relevant skills and knowledge (competencies) but also the capabilities identified in Attachment One that enable them to know which unique sub-set of these generic and role specific skills and knowledge to deploy when each new, unexpected situation is encountered and how to constantly upgrade them. They emphasise that it is when the unexpected happens, when things go awry or when an unpredicted opportunity arises that capability is most tested, not when things are running smoothly, routinely or predictably.

Furthermore, universities and colleges don't just produce workers. As already noted, they produce our future leaders (the vast majority of the world's political leaders and policy makers have been to a university). They also develop people who create their own enterprises and help invent the new sources of income we need for economic sustainability as old revenue sources dry up and 'digital disruption' rapidly reshapes our business models and how people work. Furthermore, university graduates play a central role in developing the breakthroughs necessary to manage environmental and economic sustainability and the solutions necessary to ensure social and cultural sustainability and harmonious societies. Therefore, say our higher education learning leaders, in seeking to produce graduates who are work ready *plus*, our universities need to ensure they are not only job ready and skilled for today but are in addition:

- sustainability literate (socially, culturally, economically and environmentally);
- change implementation savvy (able to productively engage a wide variety of people with necessary change and help them to deliver it);
- inventive and creative (able to create and test out innovative social, cultural, economic or environmental solutions; and are clear on what concepts like 'ethical entrepreneurialism'[vi] entail);
- clear on their considered position on the tacit assumptions driving the 21st century agenda (assumptions like 'growth is good for everyone'; 'consumption is happiness'; 'ICT is the answer'; and 'globalisation is great')[vii].

Our studies of successful early career graduates have found that their expertise is considerably enhanced both during their university studies and after graduation if they are encouraged to reflect on experience, especially when something goes awry or the unexpected happens, using as a focus the items from Attachment One that have been ranked highest in their profession by the successful early career graduates who have gone before them. These studies have found that learning is most productive when these top ranking capabilities are used by practitioners to identify the gaps in their expertise and when they consider how best to address them for next time, especially if this process is supported by just-in-time and just-for-me access to solutions found to work for others in similar roles and situations.

It is through this focused, diagnostic reflection on and learning from experience that our research indicates not only do graduates' key skills and knowledge improve but also their capabilities. And it is through such a process that the 'diagnostic maps' which enable practitioners to 'read and match' effectively when similar (but never identical) perplexing situations come across their path in the future (Schön, 1983). As John Stephenson (1992: 3) noted almost a quarter of a century ago when Director of the Royal Academy of Arts Higher Education for Capability Project:

> Capability is not just about skills and knowledge. Taking effective and appropriate action within unfamiliar and changing circumstances involves judgments, values, the self-confidence to take risks and a commitment to learn from the experience.

So to summarise: When we talk about being 'work ready' we are talking about competencies (generic and job specific skills and knowledge relevant to today). But when we talk about being 'work ready *plus*' we are talking about capabilities for not only today but for tomorrow – capabilities like the ability to 'read and match', to manage the unexpected, to be change implementation savvy, inventive, sustainability responsive, to learn from experience and to operate with a clear understanding of one's ethical position on the tacit assumptions driving the 21st century agenda. It is in this way, say the Fellowship participants, that we can assure the quality of our future leaders, inventors and entrepreneurs as well as the resilience and adaptability of our workers. And in coming to their own considered, articulated and justified position on the tacit assumptions driving the 21st century agenda, our future leaders will be able to articulate the value position they will be drawing upon when they have to take a hard decision.

This aligns with the observations of Geoff Mulgan CEO of Nesta and former Head of Policy in the UK PM's Office:

> 'Universities could be providing much more brainpower to solve the problems of the communities they live in. But incentives point in the opposite direction, for example towards attracting foreign students, or getting research published, and most rely on very traditional teaching methods – lectures, course notes, tutorials – which turn students away from practical engagement with society. I predict 2016 will bring the spread of very different methods that harness student brainpower to real life problems...
>
> Many universities already show how this could be done, combining traditional courses with team-based projects working with real clients, and drawing on a range of disciplines to solve problems. Examples include McMaster, Olin College of Engineering, parts of Stanford and Harvard, Aalto in Finland, and Monterrey in Mexico.

> Beijing's Tsinghua and Paris' Centre for Research and Interdisciplinarity at the Sorbonne have been taking this a stage further, encouraging students to do most of their course work on unsolved problems on the cutting edge of science or social innovation, rather than only learning about existing knowledge'.
>
> Mulgan, G (2016): *Challenge-driven universities to solve global problems*.

Develop inventive, ethically entrepreneurial graduates

The work ready *plus* dimensions have been explored in considerable detail in the Fellowship workshops. For example when the development of a *capacity for invention* has been explored as a key component of being work ready *plus* participants have noted that we are talking not only about producing graduates who have tested themselves in the undergraduate curriculum to see if they can help invent new sources of income in order to foster economic sustainability (e.g. new replacement sources of income as the resources boom fades and the carbon economy contracts); or people who have tried their hand at being economically entrepreneurial (e.g. in new areas ranging from 3D printing to building the *Blue Economy*) but also about graduates who have tried their hand at being ethically and socially entrepreneurial – future leaders and professionals who can help us shape and implement the solutions necessary to address the increasingly significant challenges of social and cultural sustainability.

As the new President of Imperial College, London Alice Gast (formerly from Stanford and MIT) observed in an article by Greg Hurse in *The Times* (6th October 2014: 23):

> 'To instill curiosity is really important.. (universities need to)... create the whole student and make sure they are educated to be thinkers and leaders and not just able to answer exam questions'.

In the U.S. national groups like EDUCAUSE are advocating for a shift from students being seen as the consumers in higher education to being seen as creators (Johnson et al, 2014) and far more focus in learning and assessment being given to fostering creativity - to directly developing 'the ability to put things together that do not normally go together' (Beadle, 2011). And this focus on optimising the creative potential of graduates, it is argued, is fundamental to the resilience and social, cultural, economic and environmental adaptability that is at the heart of sustainable development. During work with universities and colleges within and beyond Australia on the Fellowship a wide range of increasingly powerful creativity-oriented digital tools have been identified as now being available to support this process.

Intrinsic to transformative learning and assessment of this type is presenting learners with a real-world puzzle or disorienting dilemma which provokes them to question assumptions and take on new perspectives (Mezirow, 1991). International Journals like the *Journal of Asia Entrepreneurship and Sustainability* (see Rushworth, 2013 for an indicative article) and the Entrepreneurship Centres and courses that have emerged in universities across the world in the past decade are part of this trend[viii].

Promote the role of higher education in delivering invention not just training

We have ample evidence that higher education and the academics it produces play

a central role in driving national innovation and invention and, through this, social, cultural, economic and environmental sustainability. In Australia, for example, it was academics at CSIRO (The Commonwealth Scientific & Industrial Research Organisation) who invented WiFi, the polymer banknote, extended wear contact lenses, aeorgard, gene shears, microwave landing systems, the world's first effective influenza treatment, solar hotwater, fabric softener, distance measuring equipment for aviation, atomic absorption spectrometry, myxomatosis and calicivirus based control of rabbits, permanent press trousers and the Parkes Radio Telescope[ix]. And it was academics in Australian universities who invented the treatment for ulcers, spray-on skin, the cochlear implant (bionic ear), penicillin, the 2 minute AIDS test, the photovoltaic cell, the continuous pressure airflow mask, the forensic lamp, the scramjet, the cervical cancer vaccine, the CETO wave energy system, solar powered airconditioning, smart plastics, DQB networks, X-ray crystallography and the basis of quantum computing - the quantum bit[x].

Similar patterns can be seen in other countries. For example in Canada the electron microscope and insulin were invented at the University of Toronto; and plexiglas was invented at McGill University.

In the US *Pocket-lint* reports that Stanford scientists have developed an aluminium graphite battery that fully charges in just one minute. Aluminium-air batteries released in late 2015 have 40 times the capacity of lithium ion batteries and can recharge simply by being topped up with water. And it was MIT that developed the world wide web, the transistor radio, the human genome project, email, iRobot, the spreadsheet, technicolour, condensed soup, the link between cancer and genetics, PET scans, open courseware, nuclear fission and wind tunnels[xi]. These higher education inventions have generated significant social and economic benefits. As the MIT Entrepreneurship Development Program reports:

> At MIT, our alumni have launched more than 25,000 active companies with combined annual sales of over $2 trillion and 3.3 million jobs

Every one of the researchers behind these innovations became interested in their field of exploration, invention and creation in large part as a result of inspirational teachers and their experiences during not just their post-graduate but initially during their *undergraduate* studies. Because of this the leaders involved in this Fellowship argue that we need to position more explicitly this critically important function of university teaching and learning at the centre of program level outcomes and assessment, and to make clear how it directly links to the country's innovation agenda and its pursuit of economic, social, cultural and environmental sustainability[xii].

As Universities Australia noted in its 17 November 2015 press release when congratulating Bill Ferris AC on his appointment as Chair of Innovation Australia:

> Universities are major contributors to Australia's innovation agenda - as a source of ground breaking innovation through research and as educators of the next generations of innovators.

Develop graduates who are change implementation savvy

When we talk of universities producing *change implementation savvy graduates* we are talking about developing practitioners who are 'mindful'[xiii], who have an explicit and considered historical, ethical and philosophical perspective, who have transparent and considered values, who are authentic, who can engage the disengaged and who can work in partnership with multiple groups and productively with diversity. They are people who can listen, who have vision, can articulate new ideas succinctly and in plain English, and who can shape the best way to action a desired change in partnership with those intended to benefit and then ensure it is effectively implemented.

Of particular interest to participants in the Fellowship workshops has been the role which 'strategic serendipity' plays in fostering effective individual and organisational adaptation, resilience and implementation. If practitioners have high levels of personal and interpersonal capability and become well regarded and respected in the relevant networks - for giving not just receiving support - people think of them when new opportunities arise and alert them to initiatives and opportunities of which they may not otherwise be aware. Being 'strategic' is figuring out which of these opportunities to take up and which to let pass. It is in this way that high levels of emotional intelligence and a commitment to reciprocity are critical to achieving the full benefits of networked learning. In the past couple of years a number of writers and researchers have noted the importance of positive, reciprocal workplace relationships in achieving effective organisational change implementation, adaptation and resilience[xiv].

Ensure higher education assessment is 'fit-for-purpose'

> 'Much traditional assessment tends to focus on remembering and repeating conceptual knowledge and understanding, whereas employability is more likely to be predicated on students' ability to apply that knowledge in different contexts: solving problems, thinking critically, performing in professional settings or analysing case studies. If assessment continues to focus largely on knowledge acquisition and understanding, and less on the capacity to find things out and use the knowledge in context, then it will steer tutors and students away from learning for employability… Assessment reform with these aims would … build on existing efforts to design integrative and creative assessment that is more able to determine authentic achievement.'
>
> HEA (2012: pg 12)

There is considerable evidence that graduates learn about and are best assessed on the key capabilities identified above and in Attachment One through the use of strategies which are integrated, transdisciplinary, dilemma-based and drawn from daily practice. These can be instances actually confronted when on a practicum placement or simulations of them. This form of learning and assessment works best if the student uses the key capabilities and competencies identified by the successful early career graduates who have gone before them in their field of study as a diagnostic framework for focused reflection. This notion of 'authentic assessment'[xv] – assessment which is experiential, integrated and transdisiplinary is not new. It has been emphasised over the past century by people like John Dewey in the 1930s (1933 and 1938); Kolb in the 1980s (1984) and in the 1990s by Boud, et al (1993); and Boud & Filetti (1998).

And, as Alan Tough (1979, 2005) has reminded us from his research on the adults' learning projects across multiple cultures, a key resource for such learning is having access to a 'successful traveller' further down the same change (i.e. learning) path we are on who is doing well. Thus the recommended use of successful early career graduates as a key source for validating university learning program outcomes, providing real world cases and dilemmas for learning and assessment and to identify for new students the capabilities that most count for effective professional performance in their professional area how they have learnt to most effectively handle them.

Key areas for action

As noted earlier, two themes run through what has emerged from and have underpinned this senior teaching fellowship.

Good ideas with no ideas on how to implement them are wasted ideas
and
Change doesn't just happen but must be led, and deftly

The specific insights and recommendations from the leaders consulted during the Fellowship on each of these integrating themes will now be summarised. They give operational detail to the overview provided in the first part of this paper.

First the key insights around the 'good ideas theme' will be identified and then the key insights around the 'effective change leadership and implementation' theme will be discussed.

'Good ideas' on assuring achievement standards and the quality of assessment

This involves making sure we focus on what counts when determining program-level outcomes and then ensuring these outcomes are systematically addressed and effectively assessed throughout the course of the degree or diploma concerned. It concerns ensuring that the importance of developing graduates who are not only work ready for today but who are work ready *plus* for tomorrow is kept firmly in mind. Below the recurring insights from all of those involved in the Fellowship on how this 'good idea' might best be addressed are summarised:

Recognise that assessment drives learning

"Students can, with difficulty, escape from the effects of poor teaching, they cannot (by definition if they want to graduate) escape the effects of poor assessment".

Boud, D (1995: 36).

We have robust evidence extending back for many decades that, for the large majority of students in our higher education institutions, assessment drives learning and communicates what we value in our universities and colleges (see, for

example, James, McInnis & Devlin, 2002, Ramsden 2003). As Harris and James (2006: 26) have observed:

> Assessment sends unambiguous messages to students about the type of learning most valued and therefore strongly influences the approaches students take toward their studies. Assessment drives learning – 'what is assessed gets done' is largely true.

And this research shows that what students (and staff) value most in this process is knowing that where they are headed 'successful travellers' before them have found to be most relevant and productive.

Distinguish between 'change' and 'progress'

Governments, students, society and families all want to know we have carefully established those program-level outcomes that will have a demonstrably positive, sustainable outcome that benefits us all. There is a profound difference, however, between 'change' (something becoming or being made different - a conclusion that, for example, graduates have clearly developed new capabilities) and 'progress' (a value judgement that this has made things 'better' - that, for example, the capabilities developed in graduates are seen as being 'beneficial'). It is important to keep in mind, therefore, that any conclusions that there has been 'progress' in what we are assessing, any conclusions that we have set the 'right' outcomes for our higher education programs are heavily personal and value-laden.

Give focus to developing work ready plus graduates

It has been argued in this paper that producing consistently high quality, work ready *plus* graduates is the key to the new university and the nation's future and sustainability – universities create the leaders, the ethical entrepreneurs, inventors and new income streams for tomorrow not just the workers for today.

Steven C. Ward writing in *Inside Higher Education* in February 2016 provides a robust critique of the shift to competency-based education in some post-secondary systems:

> 'In this new model, students in more elite institutions will go on … having access to powerful knowledge as a core part of their university experience, while those at lower-tier public institutions will be loaded up with watered-down, box-checking skills and vague competencies like "critical thinking" or "intercultural understanding" to be provided by standardized, online platforms…. Despite the rhetoric of "serving the underserved" and "closing the skills gap," (the proponents of CBE) are responsible for generating new hierarchies between those who receive a cheap, fast food-style or "good enough" education from those who receive a quality one. They are forging new barriers and strata in an already highly stratified higher education system, not removing them as they often claim'.

'Flip' the curriculum not just the classroom

To produce work ready *plus* graduates with the capabilities that count it is necessary, say Fellowship participants, to 'flip the curriculum' by starting with the program level outcomes that have been demonstrably confirmed as being most relevant and desirable and then 'backward mapping' (Elmore, 1979) from them to ensuring the design of learning, teaching and assessment systematically build them. Flipping the curriculum has much to do with John Biggs (2014) notion of

'constructive alignment' and Wiggins and Tighe's (2005) notion of 'backward design':

> "In constructive alignment, we start with the outcomes we intend students to learn, and align teaching and assessment to those outcomes… Learning is constructed by what activities the students carry out; learning is about what they do, not about what we teachers do. Likewise, assessment is about how well they achieve the intended outcomes, not about how well they report back to us what we have told them… Constructive alignment can be used for individual courses, for degree programmes, and at the institutional level, for aligning all teaching to graduate attributes".
>
> Biggs (2014:1)

> 'We are advocating the reverse of common practice… We ask designers to start with a much more careful statement of the desired results – the priority learnings – and to derive the curriculum from the performances called for or implied in the goals. Then, contrary to much common practice, we ask designers to consider the following questions after framing the goals: What would count as evidence of such achievement? What does it look like to meet these goals? What, then, are the implied *performances* that should make up the assessment, toward which all teaching and learning should point? Only after answering these questions can we logically derive the appropriate teaching and learning experiences so that students might perform successfully to meet the standard.'
>
> Wiggins & McTighe (2005: 17)

Backward mapping as the focus of curriculum design and review can be achieved if we:

Use a comprehensive assessment-focused higher education curriculum development and review framework.

This, say Fellowship participants, should be used to ensure that the process of curriculum design and review starts not with the content we think students should learn or with a disaggregated set of 'modules' but with a peer-reviewed, integrated and validated set of program level outcomes – that is, with the capabilities and competencies students in the degree concerned will need to demonstrate in combination to be confirmed on graduation as being work ready *plus* - each tested internally and, when necessary, externally via peer review for its validity (relevance and desirability) against the evidence from multiple reference points.

There are six 'keys' to 'flipping' the curriculum. In this approach (1) program teams start with making sure they have the 'right' (agreed, tested, comprehensively considered and validated) degree level outcomes. Then, from this starting point, in the following order they (2) map backwards to ensure these program level outcomes are picked up in all of the units of study during the degree in a scaffolded way ('right' mapping), (3) confirm that the assessment in each unit is valid and integrated (i.e. that it is 'right', fit for purpose), (4) establish that everyone is clear on how and upon what criteria and evidence different grades will be allocated ('right' grading), and (5) assist markers to apply these tests reliably via a process of inter-grader calibration ('right' calibration).

Only after this is done, should learning program teams (6) set about ensuring that the learning methods and resources built into each unit of study are 'right' - that is fit-for-purpose – by confirming that they will directly enable students to perform

effectively on assessment in ways that demonstrate they have achieved the desired outcomes (the capabilities and competencies) sought.

In adopting this approach, the aim is to create an outcomes-focused, engaging, relevant, integrated, interactive, mutually reinforcing 'ecosystem' of assessment, support, delivery and learning (Biggs, 2014: 10).

It is important to emphasise that giving each program team a central role in establishing valid program-level outcomes using evidence-based peer review against a set of consensually agreed and weighted reference points is critical if the inappropriate emergence of a 'one size fits all' exit test as an alternative way to confirm the quality of graduate outcomes is to be avoided. As Gallagher (2010: 159) noted when citing Williams, 2010:

> 'Provided the standards are clearly stated and readily available, validated by the relevant subject and professional community as useful, valuable and appropriate, and form the basis for the assessment of students, then the variations between subjects and institutions should become a reason for celebration, not the sort of angst about irreconcilable differences'.

'Constructive alignment' also involves ensuring that the selected learning and teaching strategies and assessment are in sync with and underpinned by aligned support services and by an aligned resource, policy and governance system along with a nested set of carefully selected and trained local change leaders to enact it.

In short, it is agreed that far more 'systems' thinking' is necessary when seeking to assure the quality of achievement standards and assessment in our colleges and universities.

This work is best undertaken as a collaborative effort between the whole team teaching each program whenever a new degree or diploma is being developed or a current one is being reviewed. This will help ensure program coherence and avoid what Brown (2014, Ch 8) calls the 'cantonised curriculum, where each module or unit behaves like a semi-autonomous canton'. This, in turn, implies that there should be not only unit level assessment but some focus on program-level assessment tasks like capstones or ePortfolios and greater linkages across unit level assessment.

Use a validated and comprehensive professional and graduate capability framework

Using this is important in order to ensure that the program-level outcomes that drive the whole system are comprehensively addressed and articulated and that all potentially relevant capability and competency options have been considered (Attachment One).

Use a validated and comprehensive quality and standards framework for learning and teaching in higher education and associated checkpoints

Using such a framework is important to ensure that the assessment and outcomes-focused learning system is well designed (it is the total student experience that counts for productive learning and outcomes not just what happens in the traditional classroom); and that this is not only appropriately supported but also staffed by academics capable of delivering it.

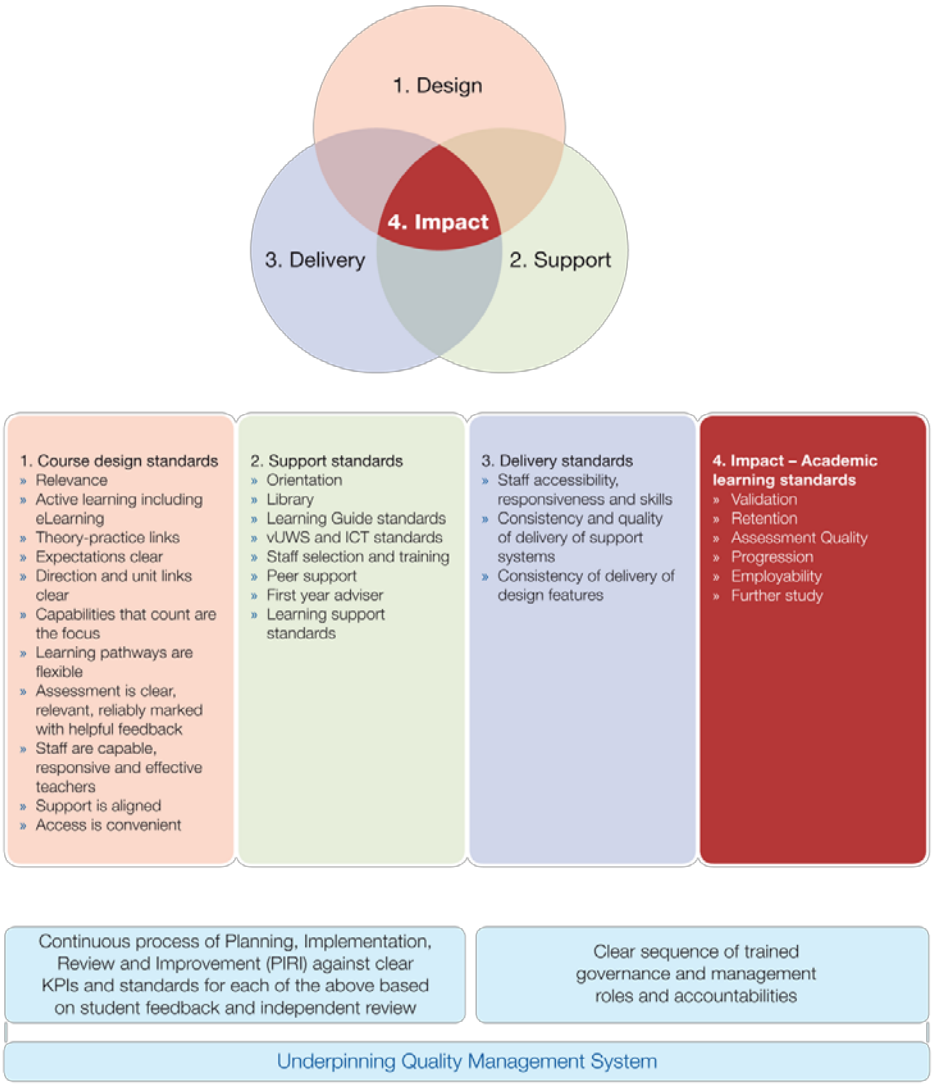
Diagram Two depicts such a framework, which has been commended in external audits, adopted by a number of Australian universities and is aligned with research on what engages and retains university students in productive learning (Scott, 2006, 2008). It also aligns with similar frameworks in other countries.

This Quality and Standards Framework for Learning and Teaching is comprised of four interlaced design elements, each with an empirically verified set of quality checkpoints. They are:

1. Learning design;
2. Support.
3. Delivery and
4. Impact

Whereas levels 1 and 2 of this framework are concerned with assuring the quality of inputs, levels 3 and 4 are about assuring the quality of outcomes.

Diagram Two
Learning & Teaching Quality & Standards Framework



'Flipping' the curriculum design and review process using such a framework requires starting, therefore, with a focus on level 4 – desired impact - by determining/confirming valid program level outcomes and, as noted, by then 'backward mapping' using a set of proven quality checkpoints to designing relevant units of study, ensuring their outcomes feed program level ones in a coordinated and staged way, then making sure their assessment is valid (fit-for-purpose), and that grading is clear and calibrated before finally designing the optimum, fit-for-purpose mix of active learning methods and resources (1) to enable students to engage in the learning that will help them succeed in their assessment. This process needs to ensure that there is concurrent attention to confirming there is aligned student support (2) and that capable staff are available for delivery (3).

For this 'systems approach' to assuring achievement standards and high quality program outcomes to be implemented consistently and effectively it must be underpinned by a benchmarked, aligned and integrated policy, human resources, leadership, accountability, professional development, resourcing and quality assurance tracking and improvement system. For example, if there is a commitment to adopting the 'six keys' approach to 'flipping' the curriculum design and review process this would need to be reflected in University policy for this area, in the procedural guidelines and in the existence of an online course development and review tool that reflects the 'six keys' approach.

What the national and international L&T leaders involved in the current Fellowship say works best is if, as noted earlier, this process has at its core the use of evidence-based, externally confirmed peer review of exactly the same type as that which is used to assure the quality of research. That is, they argue that decisions about program level outcomes, assessment, design and support should involve 'consensus around the data not just around the table' (Fullan & Scott, 2009: 34).

Confirm the fitness of purpose of assessment not just its fitness for purpose

The participants in the Fellowship have noted that much good work has been undertaken on the 'how' of assessment – on mapping, alignment, grading, calibration, inter-marker moderation, assuring assessment integrity and on the use of assessment for learning as well as of learning.

However, as noted earlier, they have observed that much less consideration has been given to checking that what we are assessing in the first place – at both the program and unit level - is what actually counts, that it is what work ready *plus* graduates need to be able to successfully negotiate the new world context. In a number of the case studies discussed during the fellowship, program level outcomes seem to have been almost taken for granted rather than having been carefully developed, scrutinised and validated by the program team against multiple, evidence-based reference points to which they have given justified weighting and which were then located into a comprehensive, interlinked professional/ graduate capability framework like that discussed in Attachment One.

To reiterate: it is no good to make sure we are assessing and marking carefully with great integrity if what we are marking so reliably and robustly is irrelevant. It is this notion of first confirming the fitness *of* purpose of what is being assessed before

looking at the fitness for purpose of assessment and assuring reliable grading that, say the participants in this Fellowship, is the missing link in assuring the quality of achievement standards and assessment in higher education for the 21st century and developing graduates who are work ready *plus*.

And, also as noted earlier, currently when multiple stakeholders are asked for input on what would be most relevant and desirable in a new university learning program or in the revision of an existing one they have no way of surfacing their tacit knowledge of what they are looking for into something that considers all of the possibilities and is expressed in clear, operational terms so that it makes what is to be learnt and assessed explicit. Using a framework like that outlined in Attachment One allows for both consistency of process and uniqueness and responsiveness in the outcome and, through this, helps avoid any pressure for the use of a one size fits all solution like a common graduate exit test 'to assure quality'.

Validate program level outcomes using evidence-based peer review and multiple reference points

It is suggested, therefore, that, when seeking to validate program level outcomes prior to backward mapping, it is important to take into account multiple reference points and stakeholder views, not just those of the program team, if the relevance and desirability of the capabilities and competencies we are seeking to develop in our students are to be ensured.

A suite of potentially relevant reference points was identified in the 2014 Krause, Scott et al OLT interuniversity moderation project (2014: pg 22) and endorsed during the workshops. They include, inter alia:

- the nation's qualifications' framework;
- the mission and graduate attributes sought by the particular university or college;
- professional accreditation standards (when applicable);
- international accreditation requirements (when applicable);
- the preferred capabilities identified by employers using a framework like that outlined in Attachment One and in studies of successful early career graduates in the profession concerned using the same framework;
- an analysis of professional employment advertisements and position descriptions in the field concerned;
- benchmarking against the learning outcomes identified in similar programs elsewhere that are performing well;
- reference to relevant government requirements and funding opportunities; as well as
- their own professional knowledge, experience and expertise, and
- the views of parents and students.

Fellowship participants have noted that the relative weighting given to each of these reference points and sources (along with any additional ones) needs to be made explicit and justified by the program design team and that what emerges would vary depending on the field of education or profession at hand.

As a Group of Eight discussion paper on this issue observes:

> Universities determine their standards of education having regard to a range of expectations, including the capabilities they seek in their graduates, and their own professional academic expectations and understandings of good quality. They make reference to external standards as guides to their decision-making. These references may include: the national qualifications framework and descriptors of learning outcomes; statements issued by professional bodies relating to program requirements for graduates preparing to practice in registered professional occupations; statements issued by disciplinary communities; standards set by similar universities elsewhere; findings from surveys of students, graduates and employers; and innovative approaches being undertaken elsewhere.
>
> Gallagher (2010:173)

In summary, it is recommended that, to assure the quality of program level outcomes and standards, each delivery team, when developing or reviewing its program:

- adopts a process of evidence-based peer review similar to that used to assure the quality of research by taking into consideration input from all the reference points listed above (along with others not on the list);
- as they do this they explicitly justify the relative importance weighting they are giving to each source; and that
- they accommodate the results into a comprehensive professional capability framework like that suggested Attachment One.

It is suggested that the program team could then invite those teaching a similar program in a partner higher education institution to confirm the veracity of their process and decisions and, if invited, suggest enhancements.

Give more direct attention to personal and interpersonal capabilities

The extensive qualitative feedback provided from the 65 workshops held around the world during the Fellowship has consistently highlighted that, currently in our higher education programs, there is far too little emphasis on developing and assessing '*emotional intelligence'* – on developing and assessing the key personal and interpersonal capabilities associated with effective early career professional performance and leadership, including the development of *'mindfulness'* (Bresciani Ludvik 2015; Tan, 2012) and on productive approaches to collaboration, societal participation and engagement. This is important because every study of effective early career graduates undertaken to date and surveys of employers using the validated framework in Attachment One have identified that between 7 and 9 of the top 12 capabilities rated as most important for effective practice involve personal and interpersonal capabilities.

And in the cognitive area, Fellowship participants have said more focus needs to be given to diagnosis, thinking strategically, contingently, laterally and inventively and less to learning and assessing technical skills out of context or to de-contextualised problem-solving with right or wrong answers. Graduates need, therefore, all the areas in Attachment One to be working together if their professional practice is to be agile, responsive, inventive and productive, not just one or two of the elements.

There was also widespread consensus during the Fellowship's workshops and meetings that such things as personal and interpersonal capability and diagnostic thinking may not be teachable but they are certainly learnable through guided reflection in simulated or real world cases, dilemma-based learning and assessment situations, and in internships, real-world projects and practicums.

Significantly, recent research by IPSOS for the British Council (British Council, 2015) has found that the majority of the 1709 professional leaders with higher education qualifications from 30 countries across all sectors have degrees in social sciences and humanities. As Professor Rebecca Hughes, Director of Education at the British Council said when discussing this finding:

> 'The world needs leaders who can handle complexity and give diverse perspectives on the challenges we all face. Globally… it is those with backgrounds that enable them to draw from multiple cultural reference points, and the academic training that encourages them to explore the human dimensions behind empirical data, who have tended to succeed and reach positions of leadership.'

This has direct links to the new agenda for higher education identified by Sullivan and Rosen (2008) in their examination of 'how the liberal arts and professions might serve one another, in ways that are more symbiotic than oppositional' (p x) - an issue which we explore in detail in *Turnaround Leadership for Higher Education* (Fullan & Scott, 2009: pgs 44ff). Sullivan and Rosen argue that the key purpose of higher education should be:

> 'To prepare students for lives of significance and responsibility (by developing) a life of the mind *for practice* (italics in original). This life of the mind for practice means developing students' capacity to 'blend knowledge, skill and appropriate attitude in response to unique situations that require expert judgement… higher education (needs to) provide formative experiences that enable students to gain orientation in the world, acquire the intellectual skills necessary for engaging their world, and develop reflective and ethical commitments in response.'
>
> Sullivan and Rosen, 2008:pgs.xi, xv and 22.

Possessing relevant skills and knowledge is necessary but not sufficient for effective professional performance

Possession of key skills and knowledge is therefore, say Fellowship participants, necessary but not sufficient for effective early career professional performance and our assessment and teaching need to reflect this. They also note that many of these required skill and knowledge sets can now be learnt, and self-tested out of class using IT-enabled learning and self-teaching materials, including, in some instances, MOOCs – especially if these incorporate (inter) active learning with self-testing and immediate feedback. Everyone emphasises, however, that information is not learning. If integrated assessment tasks are used then the possession and quality of set skills and knowledge will, say our leaders, automatically be tested in the context of their diagnosis and their appropriate application in addressing this diagnosis.

It is assessment tasks not course documents that reveal what students are learning

As noted earlier, there is robust evidence that, for many students, assessment drives learning. So, if one wants to know what students are taking from their higher education program, what capabilities and competencies they are

developing, then the best place to look is not at approved program documentation, course outlines or promotional brochures but at the specific assessment tasks students are being asked to undertake throughout their program of study.

Assess less but assess better by ensuring that assessment tasks are 'powerful'

> You have the right to expect that, rather than simply more of the same rote memorization work, we will offer you learning opportunities that stretch and strengthen your critical and creative learning muscles. Chris Dede, the Timothy E. Wirth Professor in Learning Technologies in the Graduate School of Education at Harvard University, calls this asking you to solve "wicked" problems…. Here's a hard truth: because of the rate of change in industry and society, we are probably preparing you for jobs that don't exist yet and life experiences you can't anticipate
>
> Milliron, 2012; pg 30

During the Fellowship participants repeatedly suggested that we should 'assess less but assess better' and identified a series of potentially useful quality tests for what would constitute 'powerful' (relevant, fit-for-purpose, integrated, real-world) assessment tasks and systems.

Key tests for 'powerful' assessment

The assessment task or tool under consideration:

1. Attracts high levels of student satisfaction;
2. Clearly addresses the key capabilities set down for the program/unit, especially those identified as characteristic of work ready *plus* graduates in the field of education concerned;
3. Brings to bear different perspectives, taps into multiple domains of learning;
4. Is integrated – that is, it concurrently seeks to assess key personal, interpersonal and cognitive capabilities in the profession/discipline concerned, along with appropriate and effective use of relevant competencies;
5. Is not just problem-based but solutions oriented; and involves doing not just knowing;
6. Has a whole-of-program focus;
7. Directly relates to what has been learnt;
8. Produces representations of what students can do rather than just a grade;
9. Can be digitally enabled;
10. Promotes academic integrity;
11. Is, whenever possible, dilemma-based/"wicked"/real-world focused/authentic and demonstrably relevant to effective early career practice;
12. Can be used for learning (formative) as well as for assessment (summative);
13. Is scalable.

This is consistent with the key points made by David Boud and Phillip Dawson from the Deakin University's Centre for Research in Assessment and Digital Learning (CRADLE) in a workshop at the 2015 International Society for the Scholarship of Teaching and Learning Conference when they identified:

> … the need for clear and defensible representations of what students can do, a focus on tasks and time on meaningful tasks, an emphasis on feedback rather than a predominant focus on marks, the development of students' capacities to make judgements of their own work and that of peers through assessment processes, a program-wide view of a full range of outcomes rather

than a focus on course units and particular knowledge outcomes, the need for assessment to be framed in terms of standards and criteria rather than numerical grades.

ISSOTL 2015 abstracts Session E8 pg 126.

Types of 'powerful' assessment

The types of powerful assessment identified during the Fellowship include:

- Capstones and other forms of program-level assessment – especially when these test the ability of students to address key technical and human challenges based on real-world cases in an integrated way (see Professor Nicolette Lee's OLT National Senior Teaching Fellowship website and report on Capstones at: http://www.capstonecurriculum.com.au/).
- ePortfolios which provide evidence of effective performance in formal courses and in co-curricular activities against the highest ranking capabilities identified in studies of successful early career graduates in the profession/discipline concerned. A good example of how this can be undertaken to scale with the involvement of employers is seen in the California State University Northridge (CSUN) Portfolium initiative. In some institutions quality assurance for the development of the ePortfolio is underpinned by a scaffolded set of subjects over the duration of the program that give focus to its development against a set of quality tests, benchmarks, successful exemplars and peer review.
- Dilemma-based assessment: Here students are confronted with a real-world dilemma - an actual 'forked-road' situation - identified by an early career graduate and asked to say what they would do and why. These dilemmas can be presented as a case, in-tray exercise, a simulation or as a trigger video.
- Field research, action research, clinical or practicum placements, internships and real-world projects – local and international – always with a focus on those capabilities in Appendix One identified as most important by successful graduates and employers in the field of practice concerned.
- The use of senior students and early career graduates to co-create assessment tasks along with a rationale on why they are relevant. (The clearing house of good practice examples in the 'Students as change agents' review by Mick Healy, 2013 gives examples).
- Role-play based on real-world cases.
- 360 degree feedback on performance using a validated professional capability framework.
- Assessment tasks focused on social entrepreneurialism, creativity, invention, addressing key issues associated with social, cultural, economic and environmental sustainability, including Blue Economy projects.
- Performances in various mediums, including scripting and production of a film or play on a 'hot' issue in the profession or discipline concerned.
- ICT-supported assessment – for example, interactive assessment including assessable gaming or Wiki-based assessment.
- Disassembling a real world product and identifying all of the aspects of the course necessary to build it; then reassembling it and applying what has been learnt to the development of a new product.
- Reflective learning journals using a validated set of high-ranking capabilities for effective practice in the specific area as a benchmark.

- Problem-based or solutions-based projects around a real world challenge identified by a community partner with their feedback and appraisal on its effectiveness as part of the assessment process.
- Negotiated Learning contracts.
- Interviews with successful early career graduates and critical discussion of the relationship between what they say and what is being learnt in the degree.
- Thesis (including undergraduate thesis) and Viva Voce.
- Critical appraisal of data, articles, performances against an agreed set of quality tests.

The searchable online *FLIPCurric* guide which has been co-created during the Fellowship (http://www.flipcurric.edu.au) provides access to some 240 examples of the above forms of assessment.

Increased use of dilemma-based assessment

During the Fellowship there has been particular interest in exploring how 'authentic', dilemma-based assessment tasks that give focus to the real world 'wicked problems' of daily practice (Rittel & Webber, 1973; UNSW 2013) might be developed and used most productively. The key suggestions on how this might best be done are listed below. It is important to note that this form of assessment, like many of the types noted above, needs to be scalable. In this regard there is particular potential to use recent developments in high-speed interactive online tools to address this challenge.

Some participants suggested that a focus on dilemma-based assessment could be facilitated by introducing a capstone unit of study called 'dilemmas of professional practice' in which students discuss in class how they would handle a series of key dilemmas identified by early career graduates in their profession or discipline and then are assessed on how they would handle an unseen dilemma using an online trigger video or case notes.

Developing and using dilemma-based assessment tasks

Developing dilemma-based assessment tasks

1. Identify successful early career graduates (e.g. people identified by their supervisors, colleagues or clients as performing effectively);
2. Ask them to identify a time when, in the first three to five years of professional practice, they were most challenged;
3. Ask them to describe what happened, especially the moment when they were suddenly "thrown", things went awry, or the unexpected happened;
4. Then ask them what they did to resolve the situation successfully and why they did this, using the framework in Appendix One as a guide;
5. Finally, ask them to make sense of their strategy by referring to the key domains, subscales and items in the professional capability framework (Appendix One.)

Using dilemma based assessment

1. When you have a pool of key dilemmas some can be used as a tool for learning – for formative assessment - and others (unseen by students) for summative assessment;
2. In both cases you present the case description of the dilemma identified by the successful early career graduate – this can be done as a written case study or as an online 'trigger' video scenario produced by actors;
3. It is critically important to 'spring the surprise' or dilemma ('forked road' situation) that the early career practitioner experienced;
4. Students are asked to diagnose what is happening and what needs, in their view, to be done;
5. They are then asked to compare and contrast their chosen diagnosis and strategy with what the successful early career graduate actually did using the top 12 ranking professional capabilities identified in studies of effective early career practitioners in the field of education/profession concerned as an evaluation framework.
6. Finally they are to note what, in the light of this comparison, they would do the same and differently if they encountered a similar (but never identical) dilemma in the future.

The examples below show how the above guidelines can be applied.

Examples of 'authentic', dilemma-based assessment

Medicine

A group of 100 final year doctors in an examination are asked to view a 'trigger' video in which a real-life dilemma unfolds on their laptop. Based on an actual case identified by a successful early career practitioner, the fledgling doctors see a young mother and two children in the doctor's waiting room. She is in a positive mood and is about to get the results of her regular, routine mammography check.

The scene cuts to the practitioner and on the screen are the results of the young mother's most recent mammography, biopsy and her associated blood tests. Each student doctor must interpret what these results suggest. It is in this way that generic and role specific skills and knowledge (for example the ability to read and interpret blood test and mammography results) are tested in context. If this is done correctly they will see that the results are very bad news, with secondaries already spreading. Each student is told that the mother is about to walk through the door and they must say how they would break the news. Their response is recorded. They then watch how the experienced practitioner does this. After this students write an essay which appraises the accuracy of their diagnosis and compares how they broke the news with the experienced doctor's approach, using the top 12 professional capabilities identified by successful early doctors as a reflection and evaluation framework.

Teacher Education

An 'interactive examination' (Jonsson and Baartman, 2006) attempts to improve the professional validity of an examination. Bloxham (2008: 18) provides the following example:

'Using a computer, students view 3 short films showing different classroom contexts. They can also access background information and transcripts of the dialogue. They are asked to describe and analyse the situations and recommend how the teachers should act. Once the students have submitted this first stage, they are presented with 'expert' solutions. They then have a week to compare their own responses against the 'expert' approach, comment on the differences and use that to identify any future learning needs that have emerged from the exercise.

'Interactive examination has many of the characteristics of learning-oriented assessment, it:

- demands higher-order thinking, application and evaluation
- involves integration of university knowledge and classroom knowledge
- allows authenticity
- involves students in assessment, judging themselves against the expert solutions
- gives the students feedback (from expert solutions) and requires them to take action on it
- involves reflection on their work
- helps students understand the assessment criteria, as the exam marking scheme is shared with them before the exam and used to frame questions for their self-assessment.'

Practicum in Teaching
The supervisor is briefed on the top 12 ranked capabilities from studies of successful early career teachers and asked to identify a time when the student being supervised is confronted with a dilemma – a forked road situation where there is no clear, 'right' way to respond. The supervisor notes what happened and how well the person being supervised handled the situation, using the top 12 capabilities as an assessment framework. The student teacher is then asked to take the supervisor's feedback and compare it with their own perception of what happened and how well they handled it taking into account the key capabilities and write a comparative essays which is submitted for assessment against a rubric discussed in class before the practicum period got underway".

(see: Bloxham, S, 2007:9)

Engineering
An early career engineer – Rosemary (not her real name) – who has been working successfully over the previous 3 years since graduation in a large construction firm. This day she is to accompany a senior partner to a public meeting about a by-pass the company is building around a regional town. They know in advance that there is considerable public opposition and are greeted by a very angry audience. The senior partner presents a series of slides on the proposed construction showing that all that is proposed is fully compliant with all the regulations. However, this does not placate the audience.

Engineering students undertaking the assessment task are asked to say what, if they were Rosemary, they would do next to resolve the situation. They are then told what Rosemary did - at a tea break she quietly approaches some of the most vociferous members of the audience, gives them her card and says it would be great if she could talk privately after the meeting so she could hear directly from them what is going on. This establishes that the mayor is a keen ornithologist and there is a flock of critically endangered local birds that nest in one of the small patches of forest that will be felled to make way for the by-pass. A diversion around this is negotiated and the by-pass project proceeds. Again students compare and contrast their strategy with Rosemary's making reference to the top 12 key capabilities identified in studies of successful early career engineering graduates.

The University of Toronto's 'Reassessing assessment: powerful assessment at the UofT' initiative is one example of how the powerful assessment agenda can be addressed in a systematic way across a university.

Ensure assessment and learning are aligned to the world beyond

> No learning-teaching process is complete without addressing the black box of assessment. In our NPDL work we … are shifting from measuring what is easy to measuring what matters.
>
> Fullan (2016: 92)

As already emphasised, an optimal learning and assessment system is interdisciplinary, integrated and is problem based and dilemma focused. It involves (inter) active learning, invention and creative response. It is peer supported; relevant to the individual; feasible; has clear direction, features timely and constructive feedback; is experiential and involves learning by doing and reflection against a proven framework. This focus is not new and was highlighted by a

number of highly influential researchers and writers in the 1980s including Donald Schön (1983) and David Kolb (1984).

If it is not feasible to take learning and assessment on site then, say our participants, make it simulated, integrated, but always transdisciplinary and dilemma-based just like the world itself. And, they note, assessment based on this approach is never going to be as prone to plagiarism as assessment based on more traditional modes of assessment like standardised, content focused essays and exams. The key message from our leaders is, therefore, to assess less but assess better.

This aligns with Sullivan and Rosen's (2008:10) conclusion:

> Practical reasoning and valid higher education experience is about participation and engagement with real-world problems and perplexities, not the abstract dissection associated with critical reasoning and traditional university analysis.

And as Paulo Freire (1968) observed some 50 years ago:

> "For apart from inquiry, apart from the praxis, individuals cannot be truly human. Knowledge emerges only through invention and re-invention, through the restless, impatient, continuing, hopeful inquiry human beings pursue in the world, with the world, and with each other."
>
> Freire, 1968

This has important implications for the way in which recent rapid developments in Information and Communications' Technology (ICT) might be used to assist the assessment process. In warning us to be wary of being seduced by 'edtech hype' in higher education over the coming decades Joshua Kim (2015) reminds us to always keep in mind that 'learning is a relational activity… (and that) … the true value of education … is only found at a scale where an educator can get to know a learner as an individual'.

Effective change management & leadership

Change doesn't just happen but must be led, and deftly

Throughout the Fellowship it was repeatedly noted that too much effort tends to be put into discussing what should change in higher education and too little into ensuring that these desired innovations and enhancements are actually put into practice - effectively, beneficially and sustainably. The following quotes highlight some of the key change implementation and leadership issues that need to be addressed:

> Reformers have the idea that change can be achieved by brute sanity
>
> George Bernard Shaw

> When the wind of change blows, some people build walls, others build windmills.
>
> Chinese proverb

> When the best leader's work is done the people say, 'We did it ourselves!'
>
> Lao Tzu 6th century BCE

> I suppose leadership at one time meant muscles. But today it means getting along with people
>
> Mahatma Ghandi

The key lessons endorsed during the Fellowship on how best to ensure the agenda outlined in the first part of the paper is consistently and effectively put into practice align with the findings from extensive earlier research on effective change management and leadership in higher education (Scott, Coates & Anderson, 2008, Fullan and Scott, 2009, Scott, Tilbury, Sharp and Deane, 2012).

These key lessons include:

Give more direct focus to capacity-building on effective change leadership

'Good ideas with no ideas on how to implement them are wasted ideas'

Fullan & Scott, 2009.

Our research and experience with effective change leadership and implementation in higher education (see above) has identified that many local and central leaders in higher education are unaware of the key lessons on how to take desired changes and ensure that they are put into practice (implemented) consistently, effectively and sustainably.

This research has also revealed that the most effective change leaders in higher education have the same capability profile as the most effective teachers and successful early career graduates. They all have high levels of emotional intelligence and are highly skilled in engaging people with desired changes and in supporting them as they seek to implement them.

Alert all staff to the key lessons on effective change implementation

> " Effective change processes shape and reshape good ideas as they build capacity and ownership amongst participants"
>
> Fullan (2015: 14)

The research on effective change implementation was reviewed in each of the Fellowship workshops. Participants confirmed that the most effective leaders of initiatives aimed at improving the achievement standards, outcomes and assessment quality in higher education:

- Listen, link, leverage and then lead, always in that order.
- Model, teach and learn.

They also confirmed that the most effective change leaders, especially those who are local leaders of change, are aware of and can successfully apply each of the following key lessons on effective change implementation in higher education:

Focus on a small number of priorities for action.

For example in one university with a large number of first generation students the strategic focus for Learning and Teaching over a five year period was a single word – 'Retention'. To engage with change people like focus and to see how their role plays an important part in making this work with demonstrable benefit for students. If priorities for action keep changing staff tend to disengage.

Start small and learn what works by trying out a desired assessment innovation under controlled conditions before scale up.

Here the motto is *ready* (we agree we need to change), *fire* (let's try out a potentially relevant solution under controlled conditions until the approach is working well), *aim* (document what the test team found worked best and use them to assist others with scale up). This is in contrast to the alternative approach of ready (we agree we need to change), aim (let's try to get the plan fool proof before we implement it), aim (let's set up a subcommittee), aim (let's bring in a consultant or commission a review). In short, effective change leaders in higher education recognise that we don't really know what works in context until we do it. The message here is start small and build on your successes.

Keep in mind that, for everyone involved, learning is change and change is learning

If staff don't have to learn how to do something new (in, for example, their assessment practices and associated teaching) we are not dealing with change only with 'window dressing'.

Recognise that change is not an event but a complex (social) learning and unlearning process for all concerned.

Launching a new assessment policy does not guarantee academic staff will engage with it or action it effectively and consistently. Therefore, effective higher education change leaders (like effective teachers) constantly keep in mind that what engages staff in productive learning is what engages students. Both seek a clear case for change, demonstrable relevance, evidence that the benefits of engaging with and learning how to 'do' the change will outweigh the costs, that what is proposed is feasible (e.g. achievable), that 'just-in-time just-for-me' solutions on how best to address any implementation challenges will be available, along with clear direction, peer support, responsive leadership, and timely and helpful feedback.

Motivators to engage are both extrinsic (promotion, rewards, job security) and intrinsic (knowing that what is being implemented will make the learning and lives of their students better). The latter set of learning motivators is particularly powerful. Canada's Michael Fullan puts it well:

> Great leaders connect others to the reasons they became educators – their moral purpose.
>
> Fullan (2016: 19).

Identify and seek to apply proven solutions to addressing the key challenges associated with effective change management of assessment in higher education

For university students make sure:

- There are clear expectations (via, for example, the use of assessment focused unit learning guides with exemplars of how assessment and grading work);
- They are clear on where each unit of study and its assessment fits into the bigger picture of where their degree program is leading;
- Feedback is timely, constructive and focused;

- There is an equivalent assessment load in each unit of study and that assessment tasks are not all due on the same day;
- To avoid over-assessment of basic skills and knowledge out of context;
- Group assessment is undertaken reliably and fairly and it is clear from the outset how 'free loaders' will be managed.

For university staff

- Ensure that the processes used to assure the quality of assessment demonstrably 'add value' and don't become 'box ticking exercises';
- Avoid time consuming meetings that do not have a productive outcome that demonstrably benefits students. This can mean, for example, to meet less but meet better in order to give people room to lead and change;
- Ensure everyone is speaking a shared language, and working from a common overall quality framework with clear accountabilities;
- Make available good practice models, exemplars and develop 'lonely planet' guides written by successful 'travellers' on how they have effectively managed the quality of assessment;
- Ensure there are aligned services and rewards for improvements in the quality of assessment;
- Provide timely tracking and improvement data in order to ensure improvement efforts are evidence-based;
- Provide timely and convenient opportunities for staff to 'benchmark for improvement' (identify proven solutions from colleagues who are attracting higher ratings in an area where they want to improve);
- Ensure leadership for the area – both central and local – is aligned, clear and accountable;
- Optimise peer support;
- Make sure sessional staff are engaged by producing targeted guides written by successful sessional staff on how to ensure assessment is productive and well managed.

Actively seek to engage the disengaged

Effective higher education leaders always listen to 'resisters' in order to identify the key change implementation challenges that will need to be addressed and to engage them in the process by acknowledging their concerns and listening for and capitalising on any positive suggestions they make. And they are aware of and apply the many other key lessons identified in *Turnaround Leadership for Higher Education* (Fullan & Scott, 2008) on how to engage the disengaged and how to align institutional incentives to this process.

Concentrate on building a 'why don't we' not a 'why don't you' culture.

In the context of this Fellowship this means leveraging the tradition of evidence-based peer review using carefully weighted multiple reference points and sources of evidence to ensure high quality, locally relevant and responsive program level outcomes. As Gallagher (2010:175) argues in his review of the area this is the best way in which to optimise not only achievement standards but also currency, relevance and responsiveness:

> … Making professional judgement more transparent is more consistent with university responsiveness than replacing judgement with a highly specified common standard.

Model how to behave constructively when things go awry or the unexpected happens.

People learn how to behave and develop a constructive, resilient and adaptive workplace culture - 'how we do things around here' - through witnessing how their leaders behave when change is in the air or when something unexpected or undesirable happens. To support this process of generating a positive, change capable culture through modelling seek to put in place leadership selection processes that give focus to the top ranking capabilities identified for the different Learning and Teaching roles in the *Learning Leaders in Times of Change* study (Scott et al, 2008).

Emphasise consensus around the data not just around the table.

The most effective higher education change leaders leverage the academic culture of consensus by encouraging those who are to implement a desired change (like improving the quality of assessment outcomes and assessment) to scrutinise the evidence on what most needs improvement attention during implementation and what solutions, proven elsewhere, are most likely to work.

Advocate for system alignment, and note the positive benefits of doing so.

Effective higher education leaders recognise that 'systems' thinking' means giving constant focus to achieving 'constructive alignment' (Biggs, 2014) between all that their university or college does. For example it means, as already noted, for our learning and teaching strategies and assessment to be in sync with and to be underpinned by aligned support services and by an aligned resource, policy, governance, human resources and quality assurance, tracking and improvement system, along with a nested set of carefully selected, well trained, accountable change leaders to enact it. Effective higher education leaders recognise that system synergy saves time and avoids wasted energy.

Recognise that effective change leadership may not be teachable but it is certainly learnable.

This can be achieved by bringing together into a consolidated picture the key lessons learnt by successful change leaders further down the same change path and by enabling fledgling leaders to then use these lessons to make sense of and learn from experience. It is for this reason that the searchable, user-designed self-teaching guide *FLIPCurric* (flipcurric.edu.au) for local leaders and program teams has been co-created during the Fellowship. In bringing together the collective experience of the 3700 participants and the many parallel projects and networks currently underway it aims to provide a convenient, 'just-in-time and just-for-me' one-stop shop for accessing successful approaches to the implementing the 'six keys' program development and review system and the key strategies for engaging staff with it[xvi].

The most engaging and productive implementation learning (i.e. change implementation) designs for staff apply, just as they do for students, our validated

RATED CLASS A learning design tests[xvii] and involve, therefore, blended (inter) active, just-in-time, just-for-me, integrated, situated, problem-based and work-linked learning with searchable access to the strategies found to work by 'fellow travellers' further down the same change path. Information technology carries great potential for supporting this situated, co-created, personalised interactivity.

Conclusion

This National Senior Teaching Fellowship has confirmed that it is the optimum combination of the right 'what' (fitness of purpose) and the right 'how' (fitness for purpose) of learning outcomes, design, support and assessment that is fundamental to assuring achievement standards and the quality of assessment in our universities and colleges.

The Fellowship has confirmed that, at a particularly volatile and disruptive period in world history, higher education has a central role to play in helping build a socially, culturally, economically and environmentally sustainable and productive future for our countries and in shaping the leaders and professionals who will enact it. To do this it has been argued that our universities and colleges need to transform graduate capabilities by giving focus not only to building work ready graduates for today but work ready *plus* ones for an uncertain tomorrow.

The collaboration with the 3700 learning and teaching leaders in universities and colleges from around the world involved in the Fellowship has identified, tested and refined a strategy to guide and enact this ambition – in terms of both 'what' might best be given focus in order to develop and assess graduates who are work ready *plus* and 'how' to ensure that the desired changes in this critical aspect of higher education are successfully, consistently and sustainably implemented.

The co-created, searchable self-teaching guide – *FLIPCurric* – (flipcurric.edu.au) brings together a wide array of practical suggestions and exemplars on how this might best be done. It is a key product of the Fellowship and we hope that it proves to be a useful tool for sustaining and spreading the key lessons learnt.

References & further reading

General references

Acosta, P et al (2014), Innovation and sustainable development business models. ESCP Europe

Altringer, Beth & Habbal, Fawwaz (2015): *Embedding design thinking in a multidisciplinary engineering curriculum*, Open, @VentureWell, 2015 at: http://venturewell.org/open/wp-content/uploads/2013/10/ALTRINGER.pdf

Bacon, Francis (1625): All rising to Great Place is by a Winding Staire" Francis Bacon, Essay No. XI, the 1625 and final edition. At: http://www.sirbacon.org/windingstair.htm

Barber, M, Donnelly, K & Rizvi, S (2013): *An avalanche is coming: higher education and the revolution ahead*, Pearson, London At: http://www.ippr.org/publications/an-avalanche-is-coming-higher-education-and-the-revolution-ahead

Barrie et al (2012): *Assessing and assuring Australian graduate Learning outcomes,* OLT, Sydney pgs 48ff.

Batchelor, D & Copeman, P (1998): The Wright Stuff - an Action Research Project in the Teaching and Learning of Playwriting in the Queensland University of Technology Academy of the Arts*, TEXT* Vol 2 No 1 April 1998 At: http://www.textjournal.com.au/april98/copeland.htm

Beadle, P (2011): *Dancing about architecture: a field guide to creativity*, Crown, UK.

Bergan, Sjur (2015): 'Developing an education for the society we want', *University World News*, 31 May 2015, Issue Number 369 at: http://www.universityworldnews.com/article.php?story=20150528105540411

Berry, W (1987): "The Loss of the University," *Home Economics* North Point Press, San Francisco. Cited in Teaching In HE in the 21st century.

Biggs, J (2003): Aligning Teaching and Assessment to Curriculum Objectives, (Imaginative Curriculum Project, LTSN Generic Centre)

Biggs, J (2014): 'Constructive alignment in university teaching', *HERDSA Review of Higher Education*, 2014, Vol 1 pgs 5-22 At: http://www.johnbiggs.com.au/academic/constructive-alignment/

Biggs, J & Tang, C (2007): *Teaching for quality learning at university*, Open University Press/McGraw Hill, Maidenhead (3rd edition)

Bloxham, S (2007): *Guide to Assessment*, originally appeared in ESCalate ITE Help Directory at: At: http://www.cumbria.ac.uk/Public/Education/Documents/Research/EducatorsStorehouse/Assessment/GuideToAssessment.pdf (accessed 6 Oct 2015)

Bloxham, S (2008): Assessment in teacher education: stakeholder conflict and its resolution, *Practitioner Research in Higher Education*, vol 2 (1): 13-21. At: https://core.ac.uk/download/files/685/29420093.pdf (accessed 13 May 2016).

Boud, D, Cohen, R & Walker, D (Eds) (1993): *Using experience for learning*, Open University Press, UK

Boud, D (1995): 'Assessment and learning: contradictory or complementary?' in P. Knight (Ed.) *Assessment for Learning in Higher Education*. London: Kogan Page.

Boud, D & Filetti, G (Eds) (1998): *The challenge of problem-based learning*, Kogan Page, UK.

Boyer, Ernest 1987): *The undergraduate experience in America,* Harper Collins, New York

Bresciani Ludvik, M (ed) ((2015): *The neuroscience of learning and development*, Stylus, Virginia.

British Council (2015): *Educational routes to the top revealed*, British Council and IPSOs, Monday 1st June 2015. At: https://www.britishcouncil.org/organisation/press/educational-routes-success-revealed

Brown, R (2010): *Comparability of degree standards?,* HEPI, Oxford.

Brown, S (2014): *Assessment, learning and teaching: global perspectives,* Palgrave, UK. ISBN: 978 1137 396662

Dewey, J. (1933*). How we think*. Lexington, Massachusetts: Heath & Co.

Dewey, J. (1938): *Experience and Education*, New York: Collier Books

Diab, Hassan: 'The answer to our problems lies in educating our youth', *University World News*, 31 May 2015. Issue 369 At: http://www.universityworldnews.com/article.php?story=20150529172922682

Elmore, R.F. (1979): 'Backward mapping: implementation research and policy decisions', *Political Science Quarterly*, 94 (4): 601-16.

Fadeeva, Z, Galkute, L, Mader, C & Scott, G (Eds) (2014): *Sustainable Development and Quality Assurance in Higher Education*, Palgrave-Macmillan, UK.

Flores, F & Gray, J (2000): *Entrepreneurship and the wired economy*, Demos, London.

Freeman, M & Ewan, C (2014): *Assuring learning outcomes and standards: good practice report*, OLT, Sydney

Freire, P (1969): The pedagogy of the oppressed, Seabury Press, New York.

Fullan, M., & Scott, G. (2009). *Turnaround leadership for higher education*. San Francisco: Jossey Bass.

Fullan, M & Scott, G (2014): *Education Plus*, New Pedagogies for Deep Learning Partnership, Washington.

Gallagher, M (2010): *The accountability for quality agenda in higher education*, Group of Eight, Canberra.

Goleman, D. (1998). *Working with emotional intelligence*. London: Bloomsbury.
Griffith University: Assessment matters! – click on the section marked 'consensus moderation'

Griffith University (2009): Toolkits on Developing and Assessing Graduate Attributes (there are toolkits on critical evaluation, interdisciplinary perspectives, professional skills, teamwork, creativity and innovation, ethical behaviour and social responsibility and many others

Harris, K-L & James, R (2006*: '*Facilitating reflection on assessment policies and practices: A planning framework for educative review of assessment'*, Studies in Learning, Evaluation* http://sleid.cqu.edu.au *Innovation and Development* 3(2), pp. 23-36. October 2006

HEA (2012): *A marked improvement: transforming assessment in HE*, HEA, York
at: https://www.heacademy.ac.uk/sites/default/files/a_marked_improvement.pdf

Hancock, P & Freeman, M (2014): *Achievement matters: external peer review of accounting standards*, OLT, Sydney

Hanover Research (2013): *Best and innovative practices in HE Assessment*, April 2013, at: http://www.grip.umn.edu/assets/best-and-innovative-practices-in-higher-education-assessment-%284%29.pdf

Hunt, D (1987): *Beginning with ourselves*, OISE Press, Toronto

Healey, M (2013): *Students as change agents*, Keynote presentation on staff-student partnerships, University of Leicester, 27 November, 2013 at: https://www2.le.ac.uk/departments/genetics/genie/working-as-partners-conference-2013/mick-healey-keynote-handout

Holdsworth, A, Watty, K & Davies, M (2009): Guide on developing capstone experiences, CSHE, University of Melbourne.

Høngsmark Knudsen. J & Lemmergaard' J (2014): 'Strategic serendipity: How one organization planned for and took advantage of unexpected communicative opportunities' *Culture and Organization* Volume 20, Issue 5, 2014 Special Issue: Luck of the Draw? Guest Edited by Sara Louise Muhr, Yiannis Gabriel and Stephen Linstead pages 392-409.

Hurst, G (2014): 'Future scientists encouraged to unleash creativity', *The Times Education*, 6 October, 2014: pg 23 at: http://www.thetimes.co.uk/tto/education/article4227601.ece

James, R, McInnis, C & Devlin, M (2002): *Assessing learning in Australian Universities*, Centre for the Study of HE, University of Melbourne.

James, R. (2003). Academic Standards and the Assessment of Student Learning: Some current issues in Australian higher education. *Tertiary Education and Management,* 9 (3): 187-198.

Johnson, L., Adams Becker, S., Estrada, V., Freeman, A. (2014). *NMC Horizon Report: 2014 Higher Education Edition*. Austin, Texas: The New Media Consortium & EDUCAUSE

Jonsson, A. and Baartman, L. K. J. (2006): 'Estimating the quality of new modes of assessment: The case of the 'interactive examination' for teacher competency'. Paper presented at the *EARLI SIG Assessment Conference*, August–September, Northumbria (http://dspace.mah.se/dspace/handle/2043/4949)

Kim, Joshua (2015): The Coming Virtual Reality for Education Hype, *Inside Higher Education*, December 16, 2015

Kolb*, D.A. (*1984*): Experiential learning*: *experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Krause, K.L et al (2014): *A sector-wide model for assuring final year subject and program achievement standards through inter-university moderation*, OLT, Sydney

Lateef, Fatimah (2010): Simulation-based learning, *J Emergency Trauma & Shock*, Oct-Dec, 2010: 3 (4): 348-52.

Lawson, R (2015): *Curriculum design for assuring learning – leading the way*, Report on 2013 National Teaching Fellowship, OLT, Sydney

Lester, S (2014): Professional standards, competence and capability Draft of paper pending in *Higher Education, Skills and Work-based Learning* 4 (1), 2014.

Lester, S. and Chapman, J. (2000) "Beyond conventional competence: a study of capable people." Accepted for *Capability* but not published before the journal closed.

Marginson, Simon (2011): Higher education & the public good, *Higher Education Quarterly*, Vol 65, No 4, October 2011: 411-433.

Mezirow, J. (1991). *Transformative dimensions of adult learning.* San Francisco: Jossey-Bass Publishers.

Milliron, M.D. (2012): An open letter to students: you're the game changer in next generation learning, *Educause Review* 2012 At: http://er.educause.edu/~/media/files/article-downloads/erm1242p.pdf

National Assessment & Accreditation Council (2006): *Quality Assurance in Higher Education*, NAAC & Commonwealth of Learning, Bangalore and Vancouver.

Nicolas, S.J., Adolfo (2011): 'Challenges to Jesuit Higher Education Today', *Conversations*, vol40 Issue 1/5.

Palmer, P., Zajonc, A., with M. Scribner. (2010) *The Heart of Higher Education: A Call to Renewal: Transforming the Academy through Collegial Conversations*. Jossey-Bass. San Francisco. (P 3. Quote is from "Wendell Berry - The Loss of the University." *Home economics*. San Francisco: North Point Press, 1987. P. 77)

Parkin, D (2014): Keynote address to the European Copernicus Conference, October 2014, Prague. At: Copernicus Conference Prague 2014.

QAA (2012): Enterprise and entrepreneurship education: guidance for UK HE providers, QAA September 2012 At: http://www.qaa.ac.uk/en/Publications/Documents/enterprise-entrepreneurship-guidance.pdf

Ramsden, P (2003): *Learning to teach in higher education*, Routledge, London

Rittel, Horst W. J. & Webber, M.J. (1973). *"Dilemmas in a General Theory of Planning" Policy Sciences* **4**: 155–169. *doi:10.1007/bf01405730. Retrieved 25 April 2013*.

Rivera, L (2015): *Pedigree: how elite students can get jobs*, Princeton Press, Princeton (Interview in *Inside Education*, 27 May 2015)

Rosen, Larry D (2012*): iDisorder: understanding our obsession with technology and overcoming its hold on us*, Palgrave Macmillan, N.Y.

Rushworth, S (2013): Entrepreneurship education: the case for adopting the team-based learning approach, *Journal of Asia Entrepreneurship and Sustainability*, VolIX, No 1, May 2-13: 14-38

Schön, D. (1983). *The reflective practitioner*. New York: Basic Books.

Scott, G. (1999). *Change matters: Making a difference in education and training*. London & Sydney: Allen & Unwin.

Scott, G. (2006). *Accessing the student voice* (Report). DEEWR, Canberra.

Scott, G (2008): *Student Engagement and Satisfaction with Learning*, (Commissioned research and analysis report to the Australian Review of Higher Education). DEEWR, Canberra.

Scott, G (2013): Improving learning and teaching quality in higher education, *South African Journal of Higher Education*, Vol 27, No 2, 2013: 275-94.

Scott, G., Coates, H. & Anderson, M. (2008). *Learning Leaders in Times of Change*. Sydney: Australians Learning and Teaching Council.

Scott, G, Tilbury, D, Sharp, L & Deane, E (2012): *Turnaround Leadership for Sustainability in Higher Education,* OLT, Sydney.

Stephenson, J (1992): Capability and quality in HE, in Stephenson, J & Weil, S (eds): *Quality in learning: a capability approach in HE*, Kogan Page, London Chapter One: pgs 1-9.

Stephenson, J & Yorke, M (1998): *Capability and quality in HE*, Kogan Page, Oxon.

Sullivan, W & Rosin, M (2008): *A new agenda for higher education: shaping a life of the mind for practice*, Jossey Bass, San Francisco.

Tan, Chade-Meng (2012): *Search inside yourself*, Harper Collins, New York.

Tough, A (1979): The adult's learning projects, OISE Press, Toronto (2nd edition)

Tough A & Donaghy, R (2005): Professor Alan Tough reflects on self-directed learning, At: http://allentough.com/learning/donaghy.htm

Tucker J. Marion, Barczakm, Gloria and Hultink , Erik Jan: Do Social Media Tools Impact the Development Phase? An Exploratory Study," *Journal of Product Innovation Management*, Dec. 2014, vol. 31, S1

UK Quality Code for Higher Education, 2016: Part B: Assuring and Enhancing Academic Quality, Chapter B1, Gloucester. At: http://www.qaa.ac.uk/assuring-standards-and-quality/the-quality-code/quality-code-part-b

UNSW (2013): Assessment Toolkit on Assessing Authentically, UNSW, Sydney at: https://teaching.unsw.edu.au/printpdf/518

Wiggins, G. (1993). Assessment: Authenticity, context and validity. *Phi Delta Kappan, 75(3)*, 200–214.

Wiggins, G & McTighe, J (2005): *Understanding by design*, Association for Supervision & Curriculum Development, Virginia (2nd edition) – Chapter One.

Williams, J. (2010). Introduction to special issue reviewing the last 15 years, *Quality in Higher Education*, Vol. 16. No 1.

Williams, P. (2010). "*Quality and Standards*". Higher Education Policy Institute (HEPI) and Joint Information Systems Committee (JISC). House of Commons Seminar. 27 January. London.

World Economic Forum (2015): The Human Capital Report 2015, in collaboration with Mercer. At: http://www3.weforum.org/docs/WEF_Human_Capital_Report_2015.pdf

Studies of successful early career graduates

Koppi, T & Naghdy, F (2009): 'The perspective of ICT graduates in the workforce' in *Managing educational change in the ICT discipline at the tertiary education level*, ALTC, Sydney, Chapter 2. At: http://www.acdict.edu.au/documents/KoppiNaghdyICTeducation2009.pdf

Rochester, S., Kilstoff, K., & Scott, G. (2005): 'Learning from success: Improving undergraduate education by understanding the capabilities of successful nurse graduates'. *Nurse Education Today*, 25(3), 181-188.

Scott, G, Chang, E & Grebennikov, L (2010): 'Using successful graduates to improve the quality of undergraduate nursing programs', *Journal of Teaching & Learning for Graduate Employability*, Vol 1 (no 1), 2010: 26-44.

Scott, G., Grebennikov, L. & Gozzard, T. (2009). 'ICT-enabled learning: the student perspective'. *Journal of Institutional Research*, 14(2), 1-16.

Scott, G. & Saunders, S. (1995). *The continuous learning improvement program for Australia's skill Olympians.* Sydney: Work Skill Australia Foundation Incorporated.

Scott, G & Wilson, D (2002): 'Tracking and Profiling Successful IT Graduates: an exploratory study', *Australasian (ACIS) 2002 Proceedings* At: http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1192&context=acis2002

Scott, G. & Yates, W. (2002). 'Using successful graduates to improve the quality of undergraduate engineering programs'. *European Journal of Engineering Education*, 27(4), 363-378.

Vescio, J. (2005). *An investigation of successful graduates in the early stages of their career across a wide range of professions* (Final Report). University of Technology, Sydney

Wells, P , Philippa Gerbic, P Kranenburg, I & Bygrave, J (2009) 'Professional Skills and Capabilities of Accounting Graduates: The New Zealand Expectation Gap?', *Accounting Education: An International Journal*, 18:4-5, 403-420,

Attachment One

Professional and Graduate Capability Framework

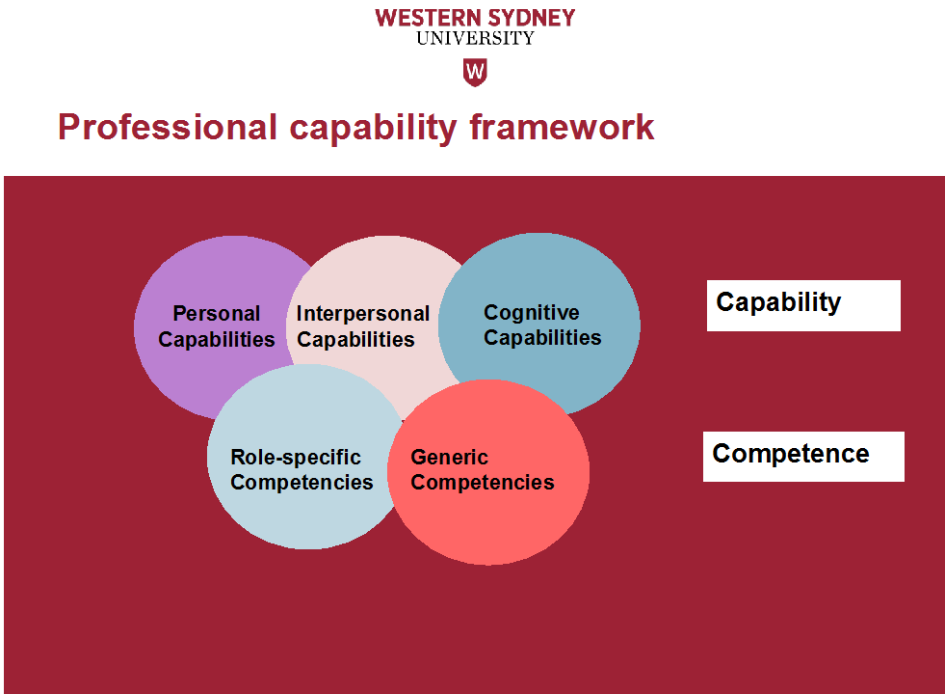
Emeritus Professor Geoff Scott
OLT Senior National Teaching Fellow 2014-6

One of the challenges faced when seeking to ensure that higher education programs focus on the capabilities that count (the Impact dimension in the Quality and Standards Framework outlined in Diagram 2) is the absence of a validated, proven capability framework to ensure that input and feedback from successful practitioners, employers and other key stakeholders is comprehensive.

Below is a professional capability framework validated in studies of successful graduates in nine professions along with studies of educational leaders in schools, VET and Higher Education. It distinguishes between capabilities and competencies.

It can be used when seeking to identify, validate and cluster the program-level learning outcomes deemed relevant in each degree or diploma, using peer review and taking into account the input from a wide range of university and external reference points.

In the tables which follow the diagram the specific capabilities validated in all these studies are presented as a series of factor analysed sub-scales. Every study undertaken to date identifies generic and role-specific competencies (skills and knowledge) as being necessary but not sufficient for effective early career performance.



Personal capabilities

Table 1 presents the scales and items developed to provide measurement of the domain of personal capability. This aspect of the practitioner's capability is made up of three interlocked components: Self-awareness, Decisiveness and Commitment.

Table 1 Personal capability scales and items

Scale	Item
Self Awareness & Regulation	Deferring judgment and not jumping in too quickly to resolve a problem
	Understanding my personal strengths and limitations
	Being willing to face and learn from my errors
	Bouncing back from adversity
	Maintaining a good work/life balance and keeping things in perspective
	Remaining calm under pressure or when things take an unexpected turn
Decisiveness	Being willing to take a hard decision
	Being confident to take calculated risks
	Tolerating ambiguity and uncertainty
	Being true to one's personal values and ethics
Commitment	Having energy, passion and enthusiasm for my profession and role
	Wanting to produce as good a job as possible
	Being willing to take responsibility for projects and how they turn out
	PA willingness to persevere when things are not working out as anticipated
	Pitching in and undertaking menial tasks when needed

Interpersonal capabilities

Table 2 presents the scales and items developed to provide measurement of the practitioner's interpersonal capabilities. This has been distinguished into two subscales: Influencing and Empathising with others.

Table 2 Interpersonal capability scales and items

Scale	Item
Influencing	Influencing people's behaviour and decisions in effective ways
	Understanding how the different groups that make up my university operate and influence different situations
	Being able to work with senior staff within and beyond my organisation without being intimidated
	Motivating others to achieve positive outcomes
	Working constructively with people who are 'resistors' or are over-enthusiastic
	Being able to develop and use networks of colleagues to solve key workplace problems
	Giving and receiving constructive feedback to/from work colleagues and others
Empathising	Empathising and working productively with people from a wide range of backgrounds
	Listening to different points of view before coming to a decision
	The ability to empathise and work productively with people from a wide range of backgrounds
	Being able to develop and contribute positively to team-based programs
	Being transparent and honest in dealings with others

Cognitive capabilities

Table 3 presents the scales and items developed to provide measurement of the domain of cognitive capability. This aspect of the practitioner's capability is made up of attributes that fit into three interlocked subscales: Diagnosis, Strategy and Flexibility & Responsiveness.

Table 3 Cognitive capability scales and items

Scale	Item
Diagnosis	Diagnosing the underlying causes of a problem and taking appropriate action to address it
	Recognising how seemingly unconnected activities are linked
	Recognising patterns in a complex situation
	Being able to identify the core issue from a mass of detail in any situation
Strategy	Seeing and then acting on an opportunity for a new direction
	Tracing out and assessing the likely consequences of alternative courses of action
	Using previous experience to figure out what's going on when a current situation takes an unexpected turn
	Thinking creatively and laterally
	Having a clear, justified and achievable direction in my area of responsibility
	Seeing the best way to respond to a perplexing situation
	Setting and justifying priorities for my daily work
Flexibility & Responsiveness	Adjusting a plan of action in response to problems that are identified during its impl
	Making sense of and learning from experience
	Knowing that there is never a fixed set of steps for solving workplace problems

Aggregated results of studies of successful early career graduates in nine professions

Table 4 presents (in rank order) the 12 items attracting the highest importance ratings in the successful graduates' research out of the full list of capabilities identified in tables 1-3.

What is noteworthy is that only one of the top 12 ranked items concerns generic or role specific competencies. The other 11 are made up of 5 specific capabilities from the personal domain; 4 from the Interpersonal domain and 2 from the cognitive domain. Our research has demonstrated that each of these is both assessable and learnable, especially if directly given focus in work-based placements, simulations and in dilemma based tasks.

Table 4

Top ranking capabilities from studies of successful graduates in 9 professions (top 12/38 in rank order)

1. Being able to organise work and manage time effectively (GSK)
2. Wanting to produce as good a job as possible (P-C)
3. Setting and justifying priorities for my daily work (C-S)
4. Being able to remain calm under pressure or when things take an unexpected turn (P-SA)

5. Being willing to face and learn from errors and listen openly to feedback (P-SA)
6. Being able to identify the core issue from a mass of detail in any situation (C-D)
7. Being able to work with senior staff without being intimidated (IP-I)
8. Being willing to take responsibility for projects & how they turn out (P-C)
9. Being able to develop and contribute positively to team-based projects (IP-E)
10. A willingness to persevere when things are not working out as anticipated (P-C)
11. The ability to empathise and work productively with people from a wide rang of backgrounds (IP-E)
12. Being able to develop and use networks of colleagues to help solve key workplace problems (IP-I)

Code

P-SA: personal–self awareness; P-D: personal-decisiveness; P-C: personal-commitment
IP-I: interpersonal-influencing; IP-E: interpersonal-emphathising;
C-D: cognitive-diagnosis; C-S: cognitive-strategy; C-F/R: cognitive-flexibility & responsiveness

These align closely with the results when the specific dimensions, subscales and items in the graduate and professional capability framework have been used to get feedback from employers (Table 5).

Table 5
Capabilities rated greater than 4/5 on importance by 147 Western Sydney employers

Personal capabilities
- Willing to learn from errors; calm under pressure; perseveres; responsible; wants to do a good job; ethical practitioner; sustainability literate; adaptable; knows own strengths/ weaknesses; can defer judgement; pitches in; has sense of humour & perspective

Interpersonal capabilities
- Empathy – can work with diversity; listens; networks well; team-player; communicates effectively; understands organisations; not intimidated

Cognitive capabilities
- Can set priorities; sees key point; diagnostic not fixed approach; can adjust plans in practice; independent thinker; creative & enterprising

Generic skills & knowledge
- Can organise and manage workload; effective user of IT; effective at self-managed learning and professional development; sustainability literate

What is particularly noteworthy is how closely these top ranked capabilities align with those allocated most importance by university learning leaders in our 2008 *Learning leaders in times of change* study. The top ranking items for these HE leaders are given in Table 6.

Table 6 Top 12 highest ranked capabilities for HE Learning Leaders (rank order in brackets)

EI (Personal) • Being true to one's personal values & ethics (2) • Remaining calm under pressure or when things take an unexpected turn (3) • Understanding my personal strengths & limitations (5) • Energy & passion for L&T (7) • Admitting to & learning from my errors (10) **EI (Interpersonal)** • Being transparent & honest in dealings with others (1) • Empathising and working productively with staff and other key players from a wide range of backgrounds (4)	**Intellectual** • Identifying from a mass of information the core issue or opportunity in any situation (8) • Making sense of and learning from experience (9) • Thinking creatively & laterally (11) • Diagnosing the underlying causes of a problem & taking appropriate action to address it (12) **Skills & Knowledge** • Being able to organise my work & manage time effectively (6)

Distinguishing between 'capability' and 'competence'

A brief distinction between capability and competence (which aligns with the 'five circle' framework and the scales above) is given in my article in the South African Journal of Higher Education, Vol 27, no 2, 2013: 283-4

'It is important to distinguish between the terms 'capability' and 'competence', as they are often used interchangeably but incorrectly:

Whereas being competent is about delivery of specific tasks in relatively predictable circumstances, capability is more about responsiveness, creativity, contingent thinking and growth in relatively uncertain ones. What distinguishes the most effective (performers) ... is their capability -- in particular their emotional intelligence ... and a distinctive, contingent capacity to work with and figure out what is going on in troubling situations, to determine which of the hundreds of problems and unexpected situations they encounter each week are worth attending to and which are not, and then the ability to identify and trace out the consequences of potentially relevant ways of responding to the ones they decide need to be addressed ... While competencies are often fragmented into discrete parcels or lists, capability is a much more holistic, integrating, creative, multidimensional and fluid phenomenon. Whereas most conceptions of competence concentrate on assessing demonstrated behaviours and performance, capability is more about what is going on inside the person's head' (Scott, Coates and Anderson 2008, 12).

And, as Stephenson (1992, 2-3[xviii]) concluded some 20 years ago, capability depends '... much more on our confidence that we can effectively use and develop our skills in complex and changing circumstances than on our mere possession of these skills... Capability is not just about skills and knowledge. Taking effective and appropriate action within unfamiliar and changing circumstances involves judgments, values, the self-confidence to take risks and a commitment to learn from the experience'.

Lester (2014) in his draft article 'Professional standards, competence and capability" provides a comprehensive and detailed analysis of the area. He reports on a study by 'Lester and Chapman (2000) who comment that while competence "is typically concerned with fitness for purpose (or getting the job right), capability infers concern also with fitness

of purpose (or making judgements about the right job to do)" (p2), again suggesting a conceptually higher level of operation than that typically captured in most notions of competence. Nevertheless, in all these accounts the capable practitioner is also expected to be functionally competent, while also being aware of the limits of his or her competence – and potentially how to overcome them – in any given situation' (Lester, 2014: pgs 7-8).

Endnotes

[i] John Stephenson was Director of the Royal Society for Art's Higher Education for Capability (HEC) project from 1988.

[ii] This focus builds on the important work undertaken in a range of OLT Fellowships including, in 2013-14, by Romy Lawson (University of Wollongong) along with a range of other Carrick, ALTC and OLT projects over the past decade, as well as from our own studies of successful early career graduates and research with employers.

[iii] This research and experience is explored in detail in Scott (1999), Scott, Coates & Anderson (2008), Fullan & Scott (2009), Scott, Tilbury, Sharp & Deane (2012), and Scott (2013).

[iv] For example the 2015 Creative Innovation Conference noted in its introductory video that: currently the richest 1% own more than the other 99% of the world; if Facebook was a country it would be the world's third largest just behind China and India; the current use of cloud services by 2.4 billion people will grow to 3.6 billion by 2018, with some 5 billion being online by 2020; every 2 days we currently create as much information as we created from the beginning of time up to 2003; there are more mobile phones than people; that by 2020 today's learners will have 10-14 jobs by age 38; 47% of middle class jobs will have disappeared due to robots and other technologies; and that, by 2025, the world's population will be approaching 8 billion; global food demand will have risen 35% and whereas today some 1 billion people experience water scarcity by 2025 it will be 3.5 billion.

[v] The following points made by leading higher education commentators from around the world provide a useful summary of the key arguments for giving greater focus to assuring the fitness of purpose of our higher education programs and the capabilities being developed in graduates by our higher education institutions:

> The premise of current education systems is on developing cognitive skills, yet behavioural and non-cognitive skills that nurture an individual's capacity to collaborate, innovate, self-direct and problem-solve are increasingly important…. governments should be addressing not just today's short-term concerns but also planning now for the needs of tomorrow's generations.
>
> World Economic Forum (2015): The human capital report, pgs 28 - 29

> " [W]hat universities…are mandated to make or to help to make is human beings in the fullest sense of those words – not just trained workers or knowledgeable citizens but responsible heirs and members of human culture…. Underlying the idea of a university – the bringing together, the combining into one, of all the disciplines – is the idea that good work and good citizenship are the inevitable by-products of the making of a good – that is, a fully developed–human being."
>
> Berry, 1987: 77

> Higher education has lost rationale and needs to re-ground itself in the social. It will need to find the way to make visible global public goods, if it is not to follow the monasteries into oblivion.
>
> Simon Marginson, 2011: 431

> 'Universities contribute to explaining and solving the complex problems we face, socially, economically, and environmentally….. The university should be less concerned with today's business and more with tomorrow's … The next time someone in business says universities need to do what the market demands, remind them of Henry Ford's statement that if he'd listened to what his customers demanded, he'd have given them a faster horse[v]'.
>
> Professor Mark Dodgson, Director of the Technology and Innovation Management Centre at the University of Queensland Business School, *Occam's Razor*, ABC RN 24th May 2014

> Higher education is not only about the kind of jobs we want but also about who and what we aim to be…. the attitudes and behaviours that make us able and willing to solve conflicts peacefully, respect human rights and live together in diverse societies.
>
> SJur Bergan, Head, Department of Education, council of Europe (2015)

> Creativity should be encouraged and nourished in our education systems… However, in many of our education institutions, students are often aided to grow out of creativity rather than grow into creativity.
>
> Hassan Diab former Lebanese Minister of Higher Education, *University World News*, 31 May 2015

[vi] We discuss this concept in the white paper on '*Education Plus'* produced in 2014 for the NPDL in the US (Fullan and Scott, 2014).

[vii] For example Adolfo Nicolas, S.J. (2011) identifies what he calls 'the globalisation of superficiality':

> … 'When one can access so much information so quickly and so painlessly; when one can express and publish to the world one's reactions so immediately and so unthinkingly in one's blogs or micro- blogs; when the latest opinion column from the *New York Times* or *El Pais*, or the newest viral video can be spread so quickly to people half a world away, shaping their perceptions and feelings, then the laborious, painstaking work of serious, critical thinking often gets short-circuited'.

And in his book *iDisorder* Dr. Larry Rosen (2012) notes a range of distinctive psychological disorders associated with the ubiquity of the smart phone and the tendency for people to 'get high' on its use. These include obsessive-compulsive disorder (having to constantly check one's device for messages), cyberchondria (the tendency to obsessively self-diagnose by searching the web) and narcissim (living life through social media sites and the constant posting of selfies).

[viii] See, for example, the Western Sydney University MakerSpace program and the *Instigating creativity: open innovation* initiative which operates in partnership with Price-Waterhouse Coopers, Google and Cisco at: http://www.uws.edu.au/auws/arounduws_home_page/auws_archives/2014/july/instigating_creativity_open_innovation

[ix] See, for example, Our Top 10 CSIRO inventions and News at CSIRO

[x] For additional details see sites like Australian world changing inventions and discoveries.

[xi] For other US University entrepreneurship and student start up programs see the work of places like Princeton. For the top 25 US College UG programs in entrepreneurship see: http://www.entrepreneur.com/slideshow/23733

[xii] We explore this issue in detail in Chapter One of our 2014 book on *Sustainable Development & Quality Assurance in Higher Education* (Fadeeva, Galkute, Mader & Scott, 2014).

[xiii] Extensive activity and research is now underway in this area in higher education, especially but not exclusively in the U.S. (Bresciani Ludvik, 2015). In companies like Google a clear business case in terms of retention and productivity for developing mindful practitioners has been demonstrated (Tan, 2012).

[xiv] See, for example, Knudsen & Lemmergraard (2014).

[xv] Many universities are now providing guidelines on how to make assessment 'authentic'. A good example is the UNSW (2013) Assessment Toolkit on Assessing Authentically. This toolkit provides excellent guidelines on how to design such tasks and lists examples including problem-based tasks, structured clinical examinations, scenario based assessment, portfolios, solution focused tasks, forensic problem solving and video triggers.

[xvi] A wide range of excellent resources that relate to the frameworks identified in the Fellowship are available but at present these are not linked or fully searchable. A good example is the *Assuring Learning* website developed by Romy Lawson as part of a 2014 OLT Fellowship. With this in mind a prototype clearing house on assessment is being currently tested in a partnership on with Education Services Australia and a broader, parallel initiative has been reported in a partnership between CSU and OLT.

[xvii] Demonstrable **R**elevance, **A**ctive learning, **T**heory-practice links, clear **E**xpectations and **D**irection; a focus on the **C**apabilities that count, flexible **L**earning pathways, fit-for-purpose clear, **A**ssessment for learning as well as of learning, **St**aff who are capable, committed and responsive, aligned **S**upport and timely and convenient **A**ccess. See Scott, G (2006): *Accessing the student voice*, OLT, Sydney and Scott, G et al (2008): *Learning Leaders in Times of Change*, OLT, Sydney.

[xviii] Stephenson, J (1992): 'Capability and quality in HE', in Stephenson, J & Weil, S (eds): *Quality in learning: a capability approach in HE*, Kogan Page, London Chapter One: pgs 1-9.