AUSTRALIAN LEARNING & TEACHING COUNCIL

Promoting excellence in higher education

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ASSURING GRADUATE OUTCOMES

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Acknowledgements

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Contents

List of acronyms and abbreviations used

AAC&U	Association of American Colleges and Universities
ADRI	Approach Deploy Review Improve quality assurance model
AHEGS	Australian Higher Education Graduation Statement
AHELO	Assessment of Higher Education Learning Outcomes
ALTC	Australian Learning and Teaching Council Limited
AUQA	Australian Universities Quality Agency
BED	Built Environment and Design
BIHECC	Business, Industry and Higher Education Collaboration Council
CALD	Council of Australian Law Deans
CEQ	Course Experience Questionnaire
CLA	Collegiate Learning Assessment
EBP	Evidence Based Practice
ELOs	Essential Learning Outcomes
ESL	English as a Second Language
GAP	Graduate Attribute Project
GCTE	Graduate Certificate of Tertiary Education
Gen Y	Generation Y
GQS	Graduate Qualities Scale
GTS	Good Teaching Scale
GSS	Generic Skills Scale
HEAR	Higher Education Achievement Report
HEFCE	Higher Education Funding Council for England
ICT	Information and Communication Technologies
IPE	Interprofessional Education
IPL	Interprofessional Learning
IPP	Interprofessional Education
KIS	Key Information Sets
LTAS	Learning and Teaching Academic Standards
NILOA	National Institute for Learning Outcomes Assessment
OECD	Organisation for Economic Co-operation and Development
OHS	Occupational Health and Safety
OSI	Overall Satisfaction Item
OT	Occupational Therapy
TEQSA	Tertiary Education Quality and Standards Organisation
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
VIT	Victorian Institute of Teaching
VET	Vocational Education and Training
WIL	Work Integrated Learning

Overview

This guide sets out to provide the reader with a summary of what has been achieved, or is in progress, in relation to ALTC projects and fellowships associated with assuring graduate outcomes. The guide also makes recommendations about areas still to be addressed or where further work is needed. As detailed in the literature review, 'assuring' graduate outcomes means using a quality assurance approach. This means that in terms of graduate outcomes, institutions and curriculum leaders must draw on an evidence base to:

- determine the outcomes their graduates need, and at what standard
- know where and how the outcomes are developed and assessed
- evaluate the standards at which the outcomes are achieved, and
- drawing on evidence of achievement, implement strategies to improve graduate outcomes as part of the quality process.

Graduate outcomes include knowledge outcomes and generic outcomes (generally referred to as graduate attributes). Often, these knowledge and generic outcomes are inseparable because generic outcomes are entwined with discipline knowledge and associated professional practice. It is acknowledged that the transferability or transformability of generic skills is contested. Even so, this guide focuses more on generic skills (graduate attributes) than on outcomes related to discipline knowledge because that is the focus of most of the projects and fellowships. For this reason, summaries of the projects and fellowships highlight the aspects most clearly aligned with the theme of assuring graduate outcomes, as delineated in the literature review. The guide also provides links to project and fellowship resources that can be adopted or adapted for re-use.

The literature review together with the 54 projects and fellowships related to the theme of assuring graduate outcomes shows that extensive work has been undertaken in the field, both within and beyond Australia. The literature review includes a scan of Australian universities' current policies and statements of graduate attributes. Universities' most common generic attributes, apart from knowledge outcomes, appear to cluster in seven broad areas:

1. Written and oral communication
2. Critical and analytical (and sometimes creative and reflective) thinking
3. Problem-solving (including generating ideas and innovative solutions)
4. Information literacy, often associated with technology
5. Learning and working independently
6. Learning and working collaboratively
7. Ethical and inclusive engagement with communities, cultures and nations.

Many projects and fellowships have engaged stakeholders (graduates, employers and academics) to glean which capabilities are important, and how well they are generally demonstrated. It would be fair to say that views about graduate demonstration of generic outcomes are often not overly positive. Universities are beginning to be more specific about which of the generic outcomes (graduate attributes) are 'developed' or 'fostered', and more importantly which ones are assessed (or warranted). In 2010, the ALTC Learning and Teaching Academic Standards Project facilitated conversations about standards within targeted disciplines. A few universities specify levels of achievement (standards) in their statements about graduate attributes. To be able to communicate how well a graduate can demonstrate an outcome is crucial within a quality assurance approach, and this applies to minimum standards as well as higher standards of achievement.

Measuring graduate outcomes, particularly generic outcomes, is contentious and difficult. Nevertheless it is the heart of the enterprise in universities and institutions that confer qualifications. Diplomas and degrees are designed to produce educated and engaged citizens. They are also entry tickets to professions, careers and further study. Therefore, they are key to employability as well as ensuring that the expectations of graduates, the academy, the professions and the community, are met. Policy direction abroad with regard to accountability and graduate outcomes is similar to policy direction in Australia. Greater scrutiny will mean that assurance of graduate outcomes is likely to be more central to university operations. Of particular note is the mismatch between the seven common clusters of generic outcomes—the things that most universities say are important—and the gaps in how these are measured or judged. The Collegiate Learning Assessment (CLA) will provide (not uncontested) measures of students' written communication, critical and analytical thinking and problem-solving. As yet there are no sector-wide indicators to assure other common generic outcomes (**bolded**):

1. Written and **oral communication**
2. Critical and analytical (and sometimes **creative and reflective**) thinking
3. Problem-solving (including generating ideas and innovative solutions)
4. **Information literacy, often associated with technology**
5. **Learning and working independently**
6. **Learning and working collaboratively**
7. **Ethical and inclusive engagement with communities, cultures and nations.**

Measurement of these outcomes is uncommon because, as reported in the literature, it has been found to be difficult, time-consuming or impossible. There is an urgent need to find new, efficient and effective ways of judging and warranting these generic outcomes.

A key finding in the projects and fellowships considered in this guide is that outcomes are best contextualised and embedded in the disciplines. Students are likely to be more engaged in acquiring oral communication skills in order to be an effective and employable pharmacist, for example, rather than giving yet another oral presentation for its own sake. Teaching staff are also likely to be more engaged if time invested in enabling students to achieve generic outcomes contributes to the future of associated professions and effective citizenry.

The plethora of projects related to this theme attest to its importance, but sometimes also confirm universities' tendency to 'reinvent the wheel'. The 54 projects and fellowships were categorised according to their substantive focus against key points of the ADRI quality assurance model (Approach, Deploy, Review, Improve). Forty-six projects and fellowships were assigned in this way.

Figure 1 shows a snapshot of where resources have been applied so far. Even though crude, the Figure suggests what is confirmed in a reading of the project and fellowship summaries. In relation to assuring graduate outcomes, much effort has been expended determining the appropriate graduate outcomes within courses and disciplines. It is probably time to agree that most common generic outcomes across disciplines fall roughly within the seven clusters suggested here. They are similar to the most desired outcomes in other sectors within and beyond Australia.

> **Recommendation 1**: In future initiatives, fund fewer substantive studies that primarily explore the nature and meaning of graduate attributes or generic outcomes.
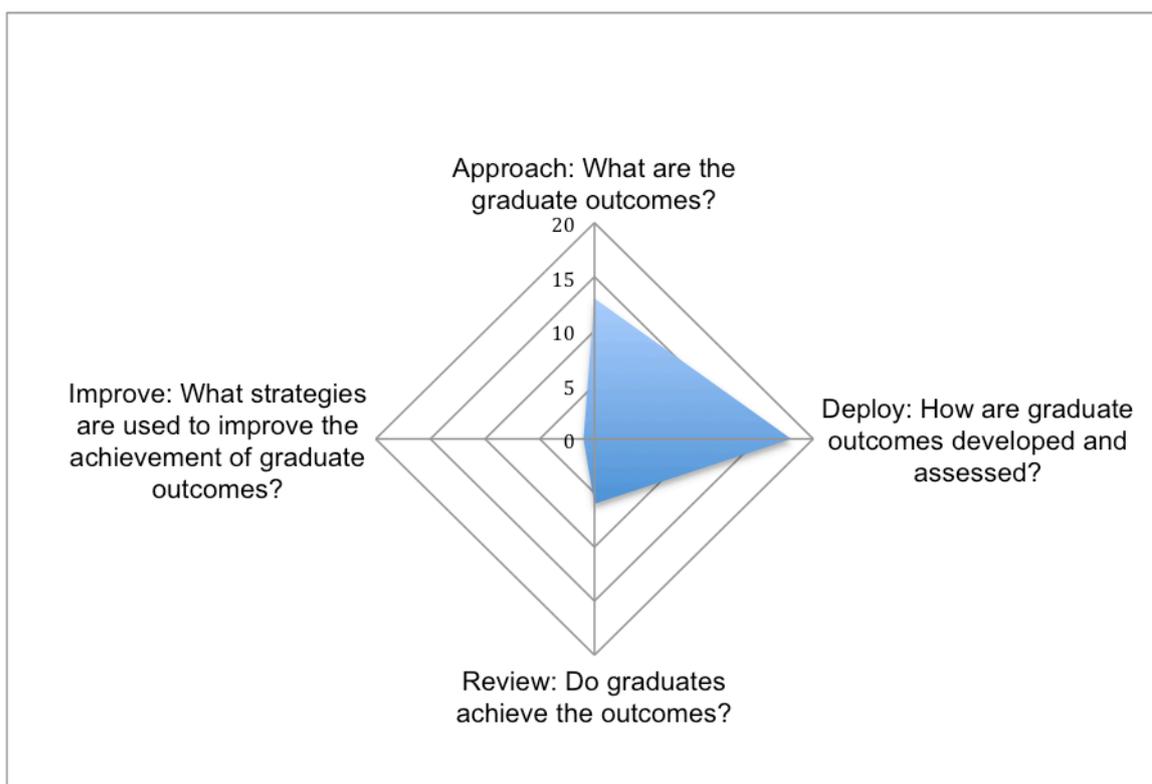
Figure 1 Numbers of projects and fellowships related to assuring graduate outcomes ADRI model

Many of the projects and fellowships considered in this guide focus on graduate attributes in general rather than any in particular. There is a wealth of literature on how to develop and assess some (written and oral communication and critical thinking, for example), and very little on others (ethical engagement, for example).

> **Recommendation 2:** In future initiatives, focus on assuring outcomes such as working and learning independently and collaboratively, creative and reflective thinking, digital literacy, and civic and ethical engagement.

Many of the discipline-based projects considered here focus on relatively new disciplines, many of which are more generalist and interdisciplinary in nature. A few also focus on assuring graduate outcomes for students of diverse cultures. There appears to be further work needed in these areas.

> **Recommendation 3:** In future initiatives, focus on assuring outcomes for graduates of interdisciplinary courses, and graduates from diverse contexts.

Figure 1 is based on emphases related to generic outcomes, not standards of outcomes. To date, apart from the LTAS project, little appears to have been done to articulate standards of generic outcomes in Australia.

> **Recommendation 4:** In future initiatives, focus on assuring standards of graduate outcomes.

Knowing what the important outcomes are, and at least the minimum standard, is the first step. The second step, equally important, is to know where those outcomes and standards are developed and assessed in the curriculum. Many projects summarised here have attempted to map attributes in curricula, and Australian universities are increasingly building course mapping into their quality assurance

processes. Mapping the intended curriculum has its limitations; nevertheless, it provides a lens through which to view the curriculum as it is experienced by students. However, simple grids showing where outcomes are taught, practiced or assessed have been found to be time-consuming to generate and of limited value. Busy academic staff should spend time on using the *results* of course mapping, rather than on providing crude 'tick and flick' data to generate such analyses. Digital information systems that aggregate unit and course information present opportunities for richer qualitative and quantitative aggregations of the intended curriculum. Such systems could also provide intelligence as to where and how *standards* in generic outcomes are developed and assessed.

> **Recommendation 5:** In future initiatives focus on creating or disseminating more sophisticated digital curriculum mapping or course aggregation systems that can be shared across and between institutions.

The real gaps identified in this consideration of projects and fellowships are related to evidence of achievement of outcomes, and strategically using that evidence to improve (perhaps in benchmarking or similar activities).

> **Recommendation 6:** In future initiatives, focus on ways of providing evidence (either through measurement or judgement) of the achievement of standards in generic outcomes.

The vast majority of projects and fellowships pertain to one discipline or, more often, to a few institutions. These more local initiatives can provide opportunities for smaller scale change. As seen in this guide, there are sometimes few products from such initiatives that can be scaled up, adopted or re-purposed. In contrast, sector-wide initiatives built on strong consortia of institutions can be an effective way to effect wide-scale change because they are pre-set to produce outcomes adaptable and re-useable at more institutions.

> **Recommendation 7:** In future initiatives, maintain a balance between smaller and larger projects, but prioritise those initiatives more likely to produce re-useable and scalable products.

One of the excellent features of the projects and fellowships considered here is extensive engagement with industry bodies, professional associations and the wider community. Several projects led directly to the formation of such bodies. Such engagement is likely to lead to more sustainable change and improvement. However, to date there appears to have been little focus on community engagement initiatives such as volunteering, service learning and others beyond the formal curriculum that are known to enhance achievement of generic graduate outcomes.

> **Recommendation 8:** In future initiatives, continue to focus on ways to work in partnership with industry and professional bodies, and focus more on community engagement initiatives with the potential to improve generic graduate outcomes.

Conclusion

Much good work has been completed and much remains to be done. New sector-wide initiatives (included here) provide opportunities to refine ideas, systems and tools that can assist busy teaching staff to be very clear about the outcomes their graduates need; adopt and adapt tools and processes from peers within and beyond their disciplines to develop and assess those outcomes; and use richer measures and judgments of achievement to inform improvements in strategic ways. Highly motivated teaching staff have and will continue to provide challenging and engaging learning experiences for students. Curriculum leaders spend countless hours aligning outcomes, assessments and experiences. These teaching and curriculum inputs are essential but insufficient. A most pressing challenge is to find increasingly rich and transparent ways of warranting graduate achievements, and at the same time ensure that graduates themselves are assured of their capabilities.

Literature review of Australian and international scholarly research and publications

Introduction

In recent years there has been a rapid shift from teacher-centred to student-centred teaching and learning practices in higher education, and this has meant a much greater focus on student learning outcomes (Huba & Freed, 2000; Mentkowski, 2000) to the point that 'learning outcomes' is a frequently-used term in all sectors, including higher education. The recent strengthening of the Australian Qualifications Framework, for example, indicates that qualifications must be designed to enable graduates to demonstrate *learning outcomes* expressed as knowledge, skills and the application of knowledge and skills (Australian Chamber of Commerce and Industry, 2007). Graduates complete courses, and course outcomes are a mix discipline specific knowledge outcomes (pharmacy knowledge) and generic skills and qualities (those required to be an effective pharmacist and an engaged citizen). The latter are commonly referred to as graduate attributes in Australian higher education. In the current climate, conversations about graduate outcomes (discipline or generic) often include reference to expected levels of achievement (standards).

This literature review attempts to capture key ideas and developments within and beyond Australia in relation to graduate outcomes and standards, and how they are assured based on an ADRI assurance framework. ADRI signifies Approach (mission, vision and values eg an institution's philosophy of teaching and learning), Deployment (how this is operationalised), Review (measuring achievement of success) and Improvement (strategies for continuous improvement) (Woodhouse, 2003). Similar models have been described for curriculum enhancement to assure graduate outcomes. Ewell, for example, uses the following descriptors to communicate phases similar to the fellowship framework: Abilities, Alignment, Assessment and Action which "together will give us the right kind of Accountability" (Ewell, 2004). The National Institute for Learning Outcomes Assessment's (NILOA) Providing Evidence of Student Learning: A Transparency Framework is a recent iteration of a quality assurance framework (National Institute for Learning Outcomes Assessment, 2010). In the context of assuring graduate outcomes, key questions, as shown in Figure 2 are:

- What are the graduate outcomes and what is the appropriate standard of achievement?
- How are graduate outcomes developed and assessed?
- Do graduates achieve the outcomes at the appropriate standards?
- What strategies are used to improve the achievement of graduate outcomes?
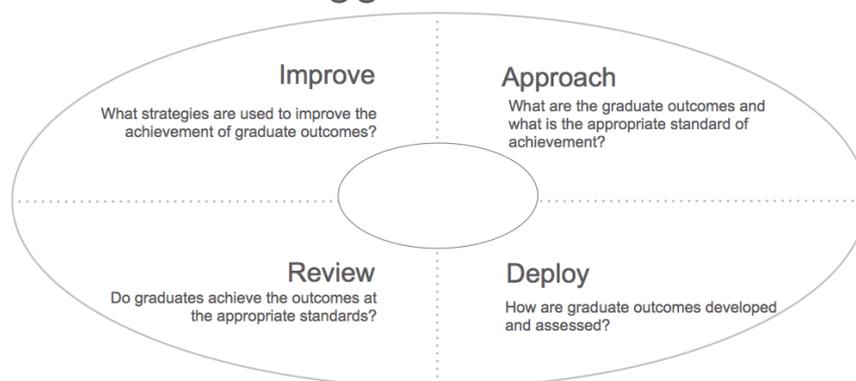
Figure 2 An ADRI approach to assuring graduate outcomes

1. What are the graduate outcomes and what is the appropriate standard of achievement?

Knowledge outcomes

Knowledge learning outcomes are the traditional domain of higher education. In Australia, the graduate outcomes of courses (ie course learning outcomes) are determined by the academic staff who teach the course (usually subject to an institution's internal accreditation or review processes) within the framework of their institution's philosophy of teaching and learning (which usually includes a statement of graduate attributes) as well as requirements from accrediting bodies, if applicable. Accreditation requirements may stipulate inputs (eg subjects to be taught), standards of delivery (eg number of staff, availability of facilities) or outputs (competencies to be demonstrated by graduates). Many courses must be accredited if their graduates are to enter the associated profession (eg nursing, accounting); other courses have the option to seek accreditation (eg public relations); and some courses are not accredited (eg media and communications).

Standards

In 2010, the ALTC Learning and Teaching Academic Standards (LTAS) project supported discipline communities to articulate threshold standards: the minimum learning outcomes a graduate must achieve including discipline-specific knowledge, discipline-specific skills including generic skills as applied in the discipline and discipline-specific capabilities (Australian Teaching and Learning Council, 2010). To date, threshold learning outcome statements are completed or underway in eight disciplines. At this stage, the future of the threshold learning outcome statements is unclear in relation to the Tertiary Education Quality and Standards Agency. Similar initiatives have been underway abroad: Harris summarises initiatives refining expectations of knowledge outcomes within subjects and disciplines, including the Tuning Process (Europe) which identifies threshold-level learning outcomes for a wide range of subjects, and the Subject Benchmark Statements (UK) wherein subject-specific statements of learning outcomes are part of the national quality assurance framework (Harris, 2009).

Generic graduate attributes

While much work has been undertaken to specify knowledge outcomes in subjects, as discussed above, on the whole, assessing and assuring discipline knowledge outcomes are generally less troubling to discipline specialists. However, in recent years, higher education has been required to also determine learning outcomes in more generic skills, attributes and competencies. In Australian higher education, these

are generally referred to as graduate attributes, and they have been a focus of considerable attention, debate, research and resourcing in Australian higher education for the past fifteen years (Barrie, 2004; Campbell, 2010; Hager, 2006). Much of the debate appears to be about nomenclature, how they can be contextualised and embedded in a discipline area, and taught and assessed by subject specialists who do not necessarily feel equipped for those tasks (Green, 2009; Radloff et al., 2009). The projects and fellowships considered here document the challenges of wrestling with graduate attributes or generic skills as learning outcomes in specific disciplines. Students enroll in discipline-based courses, and generic skills therefore must be embedded in a course and interwoven with the discipline and from the perspective of that discipline. The generic outcomes are therefore often inseparable from the discipline. For the purpose of this literature review, however, the focus will be on what institutions say they aim to achieve in terms of generic graduate outcomes: what those outcomes are, how they are developed, assessed and assured.

A scan of the sector
In preparation for this literature review, the websites of 39 Australian universities were investigated to capture approaches to graduate attributes[1] (as at May, 2011). The vast majority (38) had easily accessible statements of attributes, and many also had policies on graduate attributes. This scan revealed some noticeable trends. First, although there is clear differentiation between universities, the graduate attribute statements include some very common outcomes, as has been noted elsewhere (Barrie, Hughes, & Smith, 2009; Radloff et al., 2009). The attributes common to most universities included applying knowledge in the professions, as well as generic skills in these broad clusters:

1. Written and oral communication
2. Critical and analytical (and sometimes creative and reflective) thinking
3. Problem-solving (including generating ideas and innovative solutions)
4. Information literacy, often associated with technology
5. Learning and working independently
6. Learning and working collaboratively
7. Ethical and inclusive engagement with communities, cultures and nations.

Very few universities failed to mention attributes associated in some way with these clusters. Other attributes mentioned less frequently were associated with leadership (eight universities), self-reliance and confidence (10), scholarly integrity (four) and numeracy (four). To provide a quick visual impression (rather than a scientific analysis) of the emphases in the statements, the 'wordle' in Figure 3 is based on the 50 most common words. It is based on universities' graduate attributes statements (not policies), and like words were altered to capture emphases (for example, 'professions' and 'profession' were changed to 'professional').

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[1] Note that the inferences drawn from this scan are based on easily accessible information about graduate attribute statements or policies. Universities have practices, sometimes within faculties, which may not have been captured in this scan.

Figure 3 Wordle of the 50 most common words in 38 universities' graduate attribute statements as at May 2011

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The seven common clusters of attributes found in this scan are echoed in other Australian initiatives:

- The Australian curriculum for K-12 includes general capabilities that apply across subject-based content and equip students to be lifelong learners able to operate with confidence in a complex, information-rich, globalised world (Australian Curriculum Assessment and Reporting Authority, 2010): literacy (includes communication); numeracy; information and communication technology competence; critical and creative thinking; ethical behaviour; personal and social competence and intercultural understanding (Australian Curriculum Assessment and Reporting Authority, 2010).
- The 2007 *Graduate Employability Skills report* (Precision Consulting, 2007) focused on the Employability Skills Framework (Department of Education Science and Training, 2002): communication, teamwork, problem solving, self-management, planning and organising, technology, life-long learning, and initiative and enterprise. The report suggests that 'analysis of graduate attributes from a significant number of universities' shows that employability skills, as outlined in the Employability Skills Framework, 'may reasonably be seen as a subset of Graduate Attributes' (Precision Consulting, 2007).
- A recent report from the Business Council of Australia highlights the skills required by industry: the capabilities which allow graduates to work as part of an international team collaborating with people from different backgrounds and cultures, as well as generic skills including communication, teamwork, problem solving, critical thinking, technology and organisational skills (Business Council of Australia, 2011).

Employability

It would be fair to say that learning outcomes in Australian higher education courses have become more attuned to industry needs and graduate employability in the past ten years (note the emphasis on 'professional' in Figure 3). Current graduate attribute statements make clear links with industry and the professions, and terms like work integrated learning and work-readiness appear to be quite prominent in statements of graduate attributes. There are similarities and differences abroad: in the United

Kingdom, employability is a term used far more frequently than graduate attributes, notwithstanding that Yorke's widely accepted definition of graduate employability echoes many Australian universities' statements of graduate attributes. According to Yorke: "the skills, understandings and personal attributes that make an individual more likely to secure employment and be successful in their chosen occupations to the benefit of themselves, the workforce, the community and the economy" (Yorke, 2006). Employability has been operationalised with students through Personal Development Planning for many years (Strivens, 2007; Strivens & Ward, 2010). The following selected initiatives and reports highlight the emphases in desired generic capabilities and attributes:

- The UK Quality Assurance Agency's Subject Benchmark Statements define what can be expected of a graduate in terms of the abilities and skills needed to develop understanding or competence in the subject (Quality Assurance Agency, n.d.).
- Student Employability Profiles identify skills that can be developed through the study of a particular discipline based on subject benchmark statements. These are mapped against employer perceptions of the attributes of individuals who 'transform organisations and add value early in their careers' (Rees, Forbes, & Kubler, 2008).
- *Future Fit: Preparing graduates for the world of work* highlights the importance employers place on particular 'employability' skills (Confederation of British Industries & Universities UK, 2009) and
- *Graduate Employability: What employers want* highlights the top ten skills perceived as important in a survey of 233 UK employers (Archer & Davison, 2008).

In Europe, there has been a focus on tracking graduate destinations (Arthur, Brennan, & de Weert, 2007; Schomburg & Teichler, 2006) and as part of the Bologna Process, a focus on lifelong learning and employability (Bologna Process, 2010). As part of the Tuning process, a study was undertaken on the transferable skills or competences perceived as most important by graduates, employers and academics (, Auzmendi, Beza-nilla, & Laka, 2008). Graduates and employers emphasised skills associated with analysis and synthesis, capacity to learn, problem solving, applying knowledge, adapting to new situations, concern for quality, managing information, working autonomously and teamwork. Academics' perceptions were similar, except they placed greater weight on basic general knowledge, and less on information technology (ICT) and interpersonal competences (Villa et al., 2008).

In the United States, the focus has been less on employability and more on generic outcomes associated with liberal and general education. In the wake of the Spellings Commission which heralded a move to standardised testing (**Error! Hyperlink reference not valid.**), initiatives such as the Association of American Colleges and Universities' (AAC&U) Liberal Education and America's Promise (LEAP) explore public attitudes about the key outcomes of college in the twenty-first century. These are expressed as the 15 Essential Learning Outcomes (ELOs) (Association of American Colleges and Universities, 2004, 2005). Many of the ELOs are similar to the seven clusters indentified in Australian graduate attribute statements (although the ELOs also include Reading and Integrative learning). The AAC&U has more recently added investigations on employer perspectives through publications such as 'Raising the Bar: Employers' Views on College Learning in the Wake of the Economic Downturn' (Hart Research Associates, 2010). This attention to employability is less obvious in earlier AAC&U publications.

2. How are graduate outcomes developed and assessed?

While the move to an outcomes approach has not been without contention, it is generally agreed that sound learning outcomes are clearly communicated, observable, demonstrable and measurable (Baume, 2009). Considerable energy has been expended on determining the graduate learning outcomes, including graduate attributes, but even more has been needed to translate those statements into pedagogy within the disciplines. Alignment of learning outcomes with experiences and assessment is now widely regarded as fundamental to sound practice. This means that the intended outcomes inform the design of the learning experiences, and the assessment of the outcome (Biggs, 2007). In the UK, extensive scholarship particularly in relation to capability and employability has been led by Knight, Stephenson and Yorke (Knight & Page, 2007; Knight & Yorke, 2003; Stephenson, 1998; Yorke & Knight, 2006). In the US, prominent scholars on the assessment of learning outcomes include Mentkowski (and colleagues at Alverno College), Banta and Ewell (Banta, 2002; Ewell, 2004; Mentkowski, 2000). Key papers from the literature are available through the recently formed National Institute for Learning Outcomes Assessment, directed by George Kuh <http://www.learningoutcomeassessment.org/index.html>.

3. Do graduates achieve the outcomes at the appropriate standards?

Previous studies have found that evidence of achievement of graduate attributes is very difficult to gather, and proxy measures such as self-reported data, are often used (Barrie et al., 2009; Oliver, 2010b). The scan of universities' graduate attributes statements and policies showed that universities use a range of language to communicate how the attributes are developed, assessed or assured:

- Some universities list the attributes without clearly indicating how they are developed or assured.
- Many state that *opportunities are provided for the development of* attributes within and beyond courses.
- Many state that *attributes are embedded in disciplines and courses* and assured through course review and accreditation processes.
- Some state that attributes are *assured through the monitoring of student evaluation mechanisms.*
- Several universities map attributes in courses, using more or less sophisticated systems.
- Some universities deconstruct attributes into subcategories such as knowledge, qualities and skills; others use the terms 'capabilities' or 'qualities' rather than attributes.
- Some statements distinguish between what can and cannot be warranted. James Cook University, for example, distinguishes between 'graduate qualities to be fostered' and 'generic skills to be taught'. Others qualify the attribute, saying, for example that graduates will have an *awareness of ethical issues* rather than *demonstrate ethical behaviours.*
- A few universities have begun to delineate standards: CQUniversity, for example, includes levels of achievement (introductory, intermediate and graduate) within each attribute descriptor.
- Few universities appear to have a complete quality review process in place. However, Deakin University has a highly-developed cycle with these headings: identification of graduate attributes in course design, incorporation and assessment of attributes, communication and promotion to students, students' documentation of their attributes, program performance measures, review of the attributes and improvement cycle.
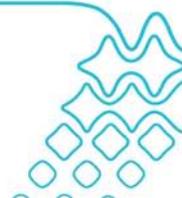
On a more macro level, there is much interest and contention within and beyond Australia on the perceived achievement of graduate outcomes. In 2007, the Business, Industry and Higher Education Collaboration Council (BIHECC) commissioned a report on how universities teach, develop and integrate employability skills into their programs of study, and how universities assess and report students' employability skills (Precision Consulting, 2007). Reports from peak bodies continue to cite deficiencies in graduates' capabilities or universities' capacity to meet expectations (Business Council of Australia, 2011). Rather than lack of capability, however, this deficiency is likely to be a mismatch of expectations around standards of achievement. For example, concerns associated with graduate communication capabilities are more likely to be that the *standard* of graduate capability does not meet the standard expected by employers.

Policy directions and evidence of graduate achievement

While universities worldwide have been making the challenging transition to learning outcomes, national policy directions have changed rapidly. In Australia, the United States and the United Kingdom, there has been a shift to an evidence-based culture of accountability in higher education. Governments, the professions, business and the wider community increasingly require assurance of outcomes contingent upon qualification levels. There have been several initiatives aimed at calibrating degree standards. The Australian Qualifications Framework has been strengthened (Australian Qualifications Framework Council, 2011). In Europe, the Bologna and Tuning processes have focused on harmonising educational structures within the European Higher Education Area (Tuning Project, n.d.). In the United States, the Degree Qualifications Profile is an attempt to create similar parity (Adelman, Ewell, Gaston, & Schneider, 2011). In addition, government agencies are moving towards publicising datasets based on quantitative measures of broad national surveys and institutional statements. The Higher Education Funding Council for England (HEFCE), for example, is proposing that universities publish Key Information Sets which include indicators of student satisfaction with a course, the teaching, learning and assessment methods, fees and accommodation costs as well institutional statements about employability (Higher Education Funding Council for England, 2010). In the US, the Voluntary System of Accountability (VSA) is an initiative by public four-year universities to supply clear, accessible and comparable information on the undergraduate student experience through College Portraits. It often includes measures of learning outcomes drawn from the results of standardised testing which measures learning that is common (such as broad communication, critical thinking and analytic reasoning) (Voluntary System of Accountability, 2008). Expanding on this idea, the Organisation for Economic Co-operation and Development (OECD) is expanding on this idea and piloting the Assessment of Higher Education Learning Outcomes (AHELO) across diverse cultures and languages. AHELO aims to test what students know and can do upon graduation, in discipline-specific as well as generic skills such as critical thinking, analytical reasoning, problem-solving and written communication (Organisation for Economic Co-operation and Development, 2010). Moreover, the results will be used to measure the value added by institutions.

The Australian government has recently announced similar accountability initiatives. 'Advancing Quality in Higher Education' outlines the Government's $1.3 billion quality agenda which includes developing, testing and implementing three new performance measurement tools: the University Experience Survey, the Collegiate Learning Assessment (CLA), and a composite Teaching Quality Indicator, the results of which will be included in the forthcoming My University website (Department of Education, Employment and Workplace Relations, 2011). Most pertinent to assuring graduate outcomes is the introduction of the CLA instrument which is designed to assess higher order thinking skills such as critical thinking, analytic reasoning, problem solving, and

written communication (Hardison & Vilamovska, 2009).

The mismatch between developed and measured graduate outcomes
The scan of graduate attributes statements suggests that generic outcomes are generally associated with seven areas, as shown in Table 1. The table also shows the national indicators by which graduate attainment can be gauged (note that the Collegiate Learning Assessment is not yet implemented, and the Course Experience Questionnaire Generic Skills Scale is self-reported data).

Table 1 Measures associated with common generic attributes in Australian universities

Common generic attribute clusters	Collegiate Learning Assessment (yet to commence)	CEQ Generic Skills Scale (self reported data)
1. Written and oral communication	Written communication	The course improved my skills in written communication.
2. Critical and analytical (and sometimes creative and reflective) thinking	Critical and analytical thinking	The course sharpened my analytic skills.
3. Problem-solving (including generating ideas and innovative solutions)	Problem-solving	The course developed my problem-solving skills; As a result of my course, I feel confident about tackling unfamiliar problems.
4. Information literacy, often associated with technology		
5. Learning and working independently		My course helped me to develop the ability to plan my own work.
6. Learning and working collaboratively		The course helped me develop my ability to work as a team member
7. Ethical and inclusive engagement with communities, cultures and nations.		

Items from the good teaching scale (GTS), generic skills scale (GSS) and overall satisfaction item (OSI) are now considered to be 'core CEQ'. Since 2002, institutions can include scales such as the Graduate Qualities Scale (GQS) if they wish (Coates, 2006). The GQS focuses on qualities typically associated with university outcomes, especially attitudes and perspectives related to the relevance of the course for lifelong learning. For example:
- The course provided me with a broad overview of my field of knowledge.
- The course developed my confidence to investigate new ideas.
- University stimulated my enthusiasm for further learning.
- I learned to apply principles from this course to new situations.
- I consider what I learned valuable for my future.
- My university experience encouraged me to value perspectives other than my own.

Measuring or judging
Underlying the gaps in Table 1 is the contentious issue of measuring many of the attributes universities commonly say they wish their graduates to have. As shown in the Table, the CLA will be introduced in Australia and its intent is to measure and report written communication, critical and analytical thinking, and problem-solving. Whether generic skills can or should be measured in this way in a standardised test is the subject of much debate and attributing changes in levels of achievement to one factor such as a course is also highly questionable (Knight & Page, 2007; Yorke, 2008). There appears to be a shift in thinking in the literature from measuring to judging achievement, particularly in relation to generic skills and capabilities, and that judgements may be based on a broader range of evidence including self- and peer assessment within and beyond the classroom, as well as artefacts from formal assessment tasks. Yorke (2008) suggests asking students how they have met, through their work, the stated aims (perhaps attributes and standards) for their course. The student then makes a case using evidence which could include marks or grades, qualitative assessments of performance in work placements, and claims of unassessed

achievements supported by evidence (Yorke, 2008).

Richer evidence through portfolios
Portfolios and progress files are tools that enable students to assume responsibility for demonstrating evidence of their achievements within and beyond the curriculum, and interest and uptake of student portfolio systems has been increasing in recent years (Chen & Light, 2010; Hallam, Harper, Hauville, Creagh, & McAllister, 2009; Hallam, Harper, McAllister, Hauville, & Creagh, 2010; Hallam et al., 2008; Joint Information Systems Committee, 2008; Oliver, 2010a). Nevertheless, the challenges of implementing portfolio systems are well documented (Joint Information Systems Committee, 2006, 2008) and they include student engagement (Jafari, 2004). To build on their portfolio initiatives, some universities have begun to establish systems for warranting students' 'life-wide' activities associated with leadership, engagement, achievement or participation. These systems are usually elective and without cost to the student, and some are based on point systems. Awards of this kind have been increasing in number in recent years. The York Award (University of York, UK) was an early example. Other international examples include Birmingham University's Personal Skills Award and the Exeter Award (University of Exeter). In Australia, the University of New England has created such an award. These awards are typically managed by career or employability services, teaching and learning centres, or both.

Warranting other achievements
These institutional supplementary awards are designed to fill gaps that have also been recognised by governments. The European Diploma Supplement (European Commission Education and Training, 2010) has been created and agreed to by 48 European countries. It is designed to aid mobility and access to lifelong learning opportunities and promotes transparency of qualifications. Institutions produce the supplement according to a template jointly developed by the European Commission, the Council of Europe and UNESCO. It has eight sections including the qualification, its level and function; the contents and results gained; certification of the supplement; details of the national higher education system plus any additional information. Graduates receive the Diploma Supplement automatically, free of charge and in a major European language. It includes a precise and objective description of the competencies acquired during study, and fosters employability.

In a similar vein, the Burgess Report (Burgess, 2007) in the UK confirmed the inadequacy of the UK honours degree classification system, declaring that such a system that 'signs-off' a person's education with a simple numerical indicator was at odds with lifelong learning and the need to do justice to the full range of student experience by allowing a wider recognition of achievement. The report signalled the need for radical reform, replacing the honours classification system with a more detailed set of information. The resulting Higher Education Achievement Report (HEAR) is intended to be the central vehicle for recording all university-level undergraduate higher education student achievement in UK institutions. The HEAR will be a single document that will capture more fully the strengths and weaknesses of the student's performance. Core content will be common to all institutions, which will be free to add additional information as they desire and are prepared to verify.

Similarly, the Australian Higher Education Graduation Statement (AHEGS) (Department of Education, Employment and Workplace Relations, 2010) is the Australian equivalent of the European Diploma Supplement provided to graduates by the awarding institution in addition to the academic transcript. Like its European and UK counterparts, its purpose is to describe a qualification in an easily understandable way, and include descriptions of the nature, level, context and status of the studies undertaken as well as information about the education system to which the qualification
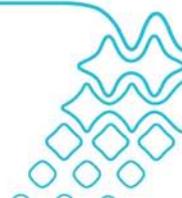
belongs. The AHEGS was implemented on a voluntary basis in 2008. It consists of five sections presented in the following order: the graduate, the award, the awarding institution, the graduate's academic achievements and a description of the Australian higher education system. Two sections are pertinent to the assurance of graduate outcomes. Institutions may include the following information, although it is not compulsory:

- In section 2, the award, institutions may include a brief description of distinguishing features of the course, such as professional placements, industry-based learning, overseas study or work integrated learning
- In section 4, the graduate's academic achievements, institutions may include additional material such as workplace learning, institutional organised study abroad or independent overseas study credited to the award, major practicum or professional training placements, and assessed competencies or graduate employability skills. Individual achievements may also be included. These include: prizes; university or faculty medals; special distinctions; and university funded or outside funded scholarships based on academic merit. Only information that can be authenticated by the institution should be included.

4. What strategies are used to improve the achievement of graduate outcomes?

It is clear from the projects considered in this guide that universities expend enormous resources on strategies to improve graduate outcomes, but often in isolation. Comparing performance with a peer and using the results to improve (benchmarking) is a well-known strategy to improve quality. Higher education has been slow to adopt benchmarking, particular in teaching and learning where outcomes, including graduate outcomes, are difficult to measure (Coates, 2010; Oliver, 2010b; Stella & Woodhouse, 2007). National indicators, because of their limitations, can only be used to compare institutions and large courses based on proxy measures. Currently, for example, comparable measures of graduate success are usually drawn from completion data, self-reported CEQ Generic Skills Scale, and the Graduate Destination Survey (which reports graduate employ*ment* rather than employ*ability*). Analysis of marks and grades is equally unsatisfactory, since information about the tasks and levels used to derive the marks and grades is often inaccessible or adds confounding variables (Yorke, 2008). Nevertheless, quantitative data give the impression of measurement, and are therefore tempting. Doubtless new measures under construction will become new rulers by which to rank, another tempting process which locks competitors into an order without reference to a standard of achievement. Benchmarking based on richer qualitative evidence might produce more fruitful results.

Conclusion

This review builds on the extensive previous work in the field. The scan of the Australian universities' graduate attributes suggests that apart from knowledge outcomes, generic attributes cluster in seven main areas. Few universities specify levels of achievement (standards) in these generic outcomes. The ALTC Learning and Teaching Academic Standards Project advanced the conversation about standards within targeted disciplines.

Assuring graduate outcomes, particularly the generic outcomes, is contentious and difficult. Nevertheless it is the heart of the enterprise in universities whose business it is to confer qualifications. Diplomas and degrees are designed to produce educated and

engaged citizens. They are also tickets to professions, careers and further study. Therefore, they are key to employability as well as a vehicle by which to ensure that graduates' expectations are met.

Policy direction abroad with regard to accountability is similar to the Australian context. Greater scrutiny will mean that *assurance* of graduate outcomes is likely to be more central to university operations. Highly motivated teaching staff have and will continue to provide challenging and engaging learning experiences for students. Many universities now expend resources mapping curricula with tools of greater or less sophistication. Emerging business intelligence systems are likely to make this process more authentic and less onerous. Teaching and curriculum inputs are essential but insufficient. The most pressing challenge is to find increasingly rich and transparent ways of warranting graduate achievements, and at the same time ensure that graduates themselves are assured of their capabilities.

ALTC projects and fellowships completed: non-disciplinary

(The year at the end of each title is the year funded.)

Addressing the ongoing English language growth of international students (CG7-453) (2007)

This project investigates how to support English as second language (ESL) students to continue to improve their **English language development**. The project considers a range of issues beyond teaching and learning. They include: confidence, isolation and anxiety as well as motivation to learn English. The study sought to investigate the relationship between academic success and two factors affecting language development:

- language and academic learning strategy use and
- affective learning variables (e.g. motivation, anxiety, beliefs).

The project deliberately chose the title "English language growth," a phrase not used in the literature, as a means to attract NESB students to the project. According to the project report, this strategy worked well with almost 800 international students providing data from five Australian universities through an online survey. Most respondents were young (80 per cent were less than 30 years old), from Chinese backgrounds and studying business and commerce. Just less than half were undergraduate (47 per cent); the remainder were postgraduate students (53 per cent). As the report notes, the study has certain limitations: given that those students with potentially the best English language skills were most likely to respond, those facing the greatest challenges are likely to be unrepresented. The findings suggest:

- learning strategies alone are not enough
- involvement in more active, integrated and social language learning environments shows a weak correlation with academic success
- cultural knowledge was important to understand English effectively
- daily use of English was crucial in the development of language skills.

Highlighted resources: The English Language Growth Resource website includes

- Resources for students (audio files explaining the screen content play automatically). There are five modules: **Staying motivated about your English; Using your English; Studying in English; What your lecturers expect of you; Strategies for you to try (**includes strategies for improving speaking, listening, reading and writing and developing vocabulary for better discipline understanding and information literacy).
- A resource for academics to assist with teaching and supervision.

Assessing students unfamiliar with assessment practices in Australian universities (PP5-43) (2005)

In response to the increasing number of **International students** within the Australian student cohort, this project aimed to determine how equivalency of student learning, assessment and the attainment of required skills can be ensured when taking into consideration different cultural and learning backgrounds. In particular, this project looked at the **attainment of generic skills** by students of **accounting**, domestically and at international sites. The study investigated **teaching staff and employer perceptions about assessment and graduate quality**. A key finding is that English competency of accounting students, as well as a different cultural background and learning preferences, may be the most important issues that impact on student

learning. Students' level of English competency determined the extent to which those students understood lecturers' expectations of them and their confidence (or lack of it) in completing the required assessment. Academic staff frequently do not use optimum forms of assessment to determine attainment of accounting generic skills; when they are used, they are gradually abandoned, owing to students' poor English skills. Assessment requirements and expectations must be made much clearer, and it is extremely important to provide early and regular feedback to students on their progress. The findings indicate a need to:

- Consider this diversity as an opportunity to develop a truly global approach to educating accounting students.
- Recognise that improvements to accommodate one group of students inevitably lead to improvements for all students.
- Understand that students from different backgrounds value the opportunity to work with, learn from and contribute to richer understandings in the classroom.
- Appreciate that, in many cases, students are more likely to behave as individuals in their approach to learning and assessment rather than as a homogenous group, based on their cultural background.

Highlighted resources:
Inclusive Assessment: Improving learning for all provides a guide for assessment design with a focus on achieving graduate skills at the unit level.

Building course team capacity to enhance graduate employability (CG8-735) (2008)

Graduate employability is the achievement of "the skills, understandings and personal attributes that make an individual more likely to secure employment and be successful in their chosen occupations to the benefit of themselves, the workforce, the community and the economy" (Yorke, 2006). Adopting this definition, this project aimed to build the capacity of university teaching staff to enhance the employability of their graduates. Outcomes include the **Graduate Employability Indicators** (GEI): online employ*ability* surveys, useable by any course in any institution, designed to supplement employ*ment* data from national surveys (such as the Graduate Destination Survey). The surveys are administered at course (program) level, and capture the perceptions of a range of stakeholders:

- Graduate perceptions of the importance of fourteen capabilities to their early professional success, and the extent to which their degree contributed to the development of those capabilities;
- Employer perceptions of the importance of fourteen capabilities to new graduates' early professional success, and the extent to which new graduates generally demonstrate those capabilities; and
- Course team perceptions of the importance of fourteen capabilities to new graduates' early professional success, the extent to which new graduates generally demonstrate those capabilities, and their confidence teaching and assessing the fourteen capabilities.

The fourteen capabilities are drawn from the National Survey of Student Engagement in the US and the Graduate Pathways Surveys in Australia. They map to most universities' **graduate attributes and generic capabilities**. Survey results can be used to inform curriculum review, professional development and benchmarking.

Highlighted resources:
The Assuring Graduate Capabilities website provides access to:

- comprehensive information about the Graduate Employability Indicators
- resources to assist teaching academics to enhance students' employability

Developing pedagogical models for building creative workforce capacities in undergraduate students—Professor Erica McWilliam—ALTC Associate Fellow (2006)

This fellowship aimed to identify instances of pedagogical approaches that favour experimental, error tolerant engagement in learning, and a move away from content knowledge towards re-organising current knowledge into new paradigms. The fellowship included a study into academic perceptions on **creativity and teaching creativity**, a creativity showcase forum, and a monograph *Preparing the creative workforce: how to launch young people into high-flying futures* (2008). Findings from the fellowship highlight that whilst universities in Australia are committed, in principle, to creativity, it is not explicitly linked to teaching and learning practices. Furthermore, current practices of assessment and teaching and learning hinder the teaching of creativity. Innovative teaching of creativity is evident in Australian universities, but is the activity of individual champions.

Highlighted resources:
Creative Workforce 2.0
Teaching for creativity: Towards sustainable and replicable pedagogical practice

Enhancing undergraduate engagement through research and inquiry—Professor Angela Brew—ALTC National Teaching Fellow (2008)

This fellowship aimed to enhance student engagement in learning through supporting the development of **undergraduate research and inquiry**. The fellowship was predicated on research which has demonstrated the long term **benefits of inquiry-based learning for students in developing certain attributes** and for
- retention and progression particularly for non-traditional students such as women (in particular disciplines)
- recruiting and preparing students for postgraduate studies
- increased confidence, improved ability to apply knowledge and skills and the development of critical thinking and problem solving skills.

Analysis of the state of undergraduate research experience programs across Australian universities highlighted several key factors such as an increase in such research programs (1500-2000 students annually), a focus in science and engineering disciplines, the use of programs to increase higher degree student enrolments, a lack of formal evaluation of undergraduate research programs, funding issues and a lack of recognition of staff involved in overseeing programs.

Highlighted resources: The Undergraduate Research in Australia website provides access to
- a wealth of resources, including Ideas and Issues:
  - Why Engage Undergraduates in Research and Inquiry
  - Implementing Undergraduate Research and Inquiry
  - Some Definitions
  - Assessment of Student Work
  - Evaluating Undergraduate Research and Inquiry
- *Undergraduate Research Experience: Program in Australian Universities* (2010), an overview of current practice and funding opportunities for inquiry-based learning
- A newsletter: *Undergraduate Research News Australia*

ePortfolio use by university students in Australia: informing excellence in policy and practice (PP7-535) (2007)

This project examined the use of ePortfolios by university students in Australia. Its goals were to: provide an overview and analysis of national and international ePortfolio contexts; document the types of ePortfolios used in Australia; examine the relationship with the National Diploma Supplement project funded by the Federal government; identify any significant issues relating to ePortfolio implementation; and offer guidance about future opportunities for ePortfolio development. An audit of educators, academic managers, and human resources staff provided information about current practice, while a series of focus groups and semi-structured interviews amplified some of the key issues raised in survey responses. Student surveys shed light on initial expectations and subsequent experiences of ePortfolios. The findings show a high level of interest in the use of ePortfolios, particularly for their potential to help students become reflective learners conscious of their personal and professional strengths and weaknesses, as well as to make their existing and developing skills more explicit. The project identified four contexts where strategies may be employed to support and foster effective ePortfolio practice: government policy; technical standards; academic policy; and learning and teaching.

Highlighted resource:
[Australian ePortfolio toolkit](#)

ePortfolio use by university students in Australia: developing a sustainable community of practice (PP8-1010) (2008)

This was stage two of the Australian ePortfolio project. It aimed to specifically explore the current scope of national and international ePortfolio communities of practice in order to identify the factors that have contributed to their success and sustainability. It was designed to: support an ePortfolio community of practice; develop strategies to encourage interest in and engagement with community of practice activities; develop and promote resources to support the diverse stakeholders in ePortfolio practice; and collaborate in the establishment of a cross-sector ePortfolio community of practice.

Facilitating national benchmarking of achievement of graduate attributes and employability skills at course level—Professor Beverley Oliver—ALTC Associate Fellow (2009)

This fellowship aimed to encourage course leaders from universities across Australia to engage in benchmarking partnerships with a focus on **capabilities for graduate employability**. The outcomes include t**he assurance of learning for graduate employability framework:** a 360-degree evidence-based approach to curriculum enhancement which includes (1) determining the capabilities and standards; (2) knowing where they are developed and assessed by mapping the curriculum and (3) mapping WIL; gathering evidence that the capabilities are achieved at the appropriate standards in (4) student portfolios and (5) course review portfolios, then (6) benchmarking with similar courses.

Highlighted resources: The Assuring Graduate Capabilities website enables access to: capabilities proforma (for mapping graduate attributes and professional competencies); standards rubrics for articulating course-wide standards in generic skills; curriculum mapping tool information and user guide; information about student portfolios; course portfolios (and links to course review and business intelligence systems); benchmarking with a focus on graduate employability information and user guide.
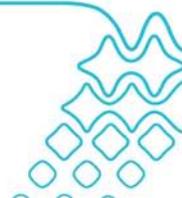
Increasing institutional success in the integration and assessment of graduate attributes across the disciplines by identifying academic staff beliefs about graduate attributes (G17-638) (2007)

Also known as the B Factor, this project investigated academic teaching staff's beliefs about graduate attributes, including:

- the relevance and importance of graduate attributes in the disciplines
- how graduate attributes are best taught and assessed, and
- their confidence and openness to teaching and assessing them.

The findings suggested that:

- Academics were familiar with their university's list of graduate attributes and thought they were an important focus.
- Personal expectations or views were identified as being most influential on staff having confidence to teach and assess certain attributes
- Levels of confidence varied depending on the attributes:
  - academics were most confident with critical thinking, problem solving and written communication
  - academics were least confident with teamwork, information literacy and communication technology
  - oral communication, ethical practice and independent learning took the middle ground.
- Discipline made a difference to the attributes emphasised in teaching and assessment
- Gender, industry experience and familiarity with the university all influenced whether staff were likely to emphasise graduate attributes in teaching and assessment
- Academic staff were likely to hold one of four beliefs about graduate attributes: enthusiast, agreeable, sponsor or sceptic.

The data informed the development of **a framework for institutional change strategies to enhance integration of graduate attributes** in Australia, regardless of the discipline. Academics were more likely to believe that graduate attributes were most effectively developed when they are integrated in the curriculum and taught by the discipline teacher and a specialist with skill in the relevant attribute, or taught by the discipline teacher and/or through WIL experiences. They were least effectively developed when they were integrated into a capstone course or developed by students independently.

Highlighted resources: The project report includes:

- A framework for institutional change strategies to enhance integration of graduate attributes (Chapter 5)

Integration and assessment of graduate attributes in curriculum (G17-633) (2007)

Also known as the **National GAP**, this project aimed to reinvigorate the implementation of graduate attributes at Australian universities through a community of practice of discipline experts and teaching and learning leaders, and facilitate a more complex, scholarly and critical understanding of graduate attributes, their attainment and assessment. Graduate attributes are defined in this project as an "orienting statement of education outcomes used to inform curriculum design and the provision of learning experiences at a university" (Barrie, Hughes and Smith, 2009, p1). The project aimed to create processes for assessing whether or not attributes are achieved, working on the basis that whilst all Australian universities make claims for graduate attributes few,

(if any), can provide convincing evidence that they have been achieved through curricula. All Australian universities also participated in one or more of the three phases of national symposia to develop the Graduate Attributes Project (GAP) framework which enabled the establishment of the community of practice.

Highlighted resources:
- Eight Issues papers (interacting elements which affect an institution's efforts to foster curriculum renewal to achieve graduate attributes): conceptions, stakeholders, implementation, curriculum, assessment, quality assurance, staff development and student perception.
- Searchable database of universities' graduate attribute statements (2009).
- Graduate attributes implementation strategies, including a post-it wall and scenarios.

Supporting student peer assessment and review in large groupwork projects (PP6-49) (2006)

The project developed and disseminated an online tool (TeCTra—Team Contribution Tracking System) to facilitate **peer assessment** in large groupwork projects, typically in capstone units. The tool is designed to alleviate issues related to groupwork by providing a mechanism by which students can reflect and review their own and their team's performance in a non-confrontational manner. Similarly, the program gives students the opportunity to provide professional, well articulated and justified judgements on peers' performance, thereby **developing core generic graduate attributes such as communication, critical thinking, professional behaviour and teamwork**. The TeCTra tool enables academics to provide formative and summative assessment in a relatively simple and time saving fashion by calculating weighted contribution factors for each student. It gives a more accurate assessment of student contribution within a large group project. The online tool utilises peer learning with an emphasis on assessment and generates quantitative and qualitative comments.

Highlighted resources:
TeCTra—Team Contribution Tracking System

The role of honours in contemporary Australia (G17-634) (2007)

This project aimed to address a gap in educational research by mapping the variations of Honours in Australian higher education. Responding to key concerns about Australian Honours degrees, such as whether Honours is an adequate benchmark for PhD scholarship allocation, the project mapped variations in respect to: the use of the term Honours, institutional and disciplinary contexts, structure and curricula, enrolment, pedagogy, resourcing, outcomes and evaluation. The project found that Honours was a pressing area for higher education policy and practice with the potential to have a major impact on the quality of learning and teaching. Concerns about **standards** in Honours focused on the equivalence of First Class Honours in the distribution of PhD scholarships rather than pedagogical dimensions. **Graduate attributes** for Honours tended to be focussed on research training, advanced disciplinary knowledge, and the production of a substantial independent research thesis.

Highlighted resources:
The most common graduate attributes of Honours degrees: project report (p.16)

Work Integrated Learning: A national framework for initiatives to support best practice (G17-632) (2007)

This project was a first national scoping study of work integrated learning (WIL) which is defined as 'an umbrella term for a range of approaches and strategies that integrate theory with the practice of work within a purposefully designed curriculum.' The decision to apply a broad definition was informed by a desired to forge new perspectives and establish an ongoing commitment to the improvement of WIL curricula. The project report notes that four of the nine recommendations in the Business, Industry and Higher Education Collaboration Council (BIHECC) report on graduate employability propose **WIL as a mechanism to develop graduate attributes and employability skills** (p.3). Participants in the scoping study clearly identified that motivations for engaging with WIL are strongly centred on the educational benefits for students including the **development of graduate attributes or generic skills and opportunities for students to engage with the professional identity** of their discipline (p.17). The project aimed to identify issues and map a broad and growing picture of WIL across Australia and to identify ways of improving the student learning experience in relation to WIL. Work-integrated learning is generally viewed as an enabler of work-ready graduates. Significantly, many universities now include WIL goals in institutional strategic plans. Using a stakeholder approach, the project consulted with students, academics and university professional staff, employers, professional associations and government as a means to develop recommendations and an implementation framework to inform, rather than drive, policy development. The project identifies key challenges experienced by those 'on the ground' delivering quality WIL experiences. However, by its own admission, this is limited owing to the sample size and distribution of data. The framework provided aims to identify the need for future work and research in this area and is predicated on the idea that a collaborative stakeholder approach must be present due to the essential nature of mutually beneficial partnerships in developing successful WIL initiatives. The project raises key overarching issues relating to the implementation of WIL and the framework is a useful guide for academic leaders to think through the complexities of initiating university-wide WIL targets.

Highlighted resource:
The WIL [Work Integrated Learning] report: A national scoping study

ALTC projects and fellowships in progress: non-disciplinary

The year at the end of each title is the year funded.

Assessing and assuring Australian graduate learning outcomes: principles and practices within and across the disciplines (SP10-1879) (2010)

A set of principles for the assessment and assurance of graduate learning outcomes will be the major project outcome. In addition, examples of authentic disciplinary practice and summaries of key project stages will be produced to serve the dual purposes of project consultation activities and post-project dissemination. A comprehensive and inclusive data-gathering process will ensure that all project outcomes reflect the views and practices of a diverse range of key stakeholder groups: professional accreditation agencies, employers, institutional leaders, coordinators and administrators, and students. The early focus on consultation will ensure that recommendations are grounded in the practices of the disciplines, and generate the vignettes. (More)

Assuring graduate capabilities: evidencing levels of achievement for graduate employability—National Teaching Fellowship, Professor Beverley Oliver (2011)

Conversations about graduate capabilities inevitably turn to standards: academic staff, business and industry, the community, students and graduates seek clarity on the level of achievement required for safe practice and professional readiness. Course (program) leaders, students and industry partners are often guided by predetermined lists of generic attributes, professional competencies and outcomes. However, many seek clarity about the level of performance required during the course, at graduation and beyond (for example, how well a journalist or pharmacist is expected to be able to communicate at graduation). In addition, in an increasingly evidence-based culture, the sector is seeking new ways to assure the achievement of such standards. This fellowship proposes to engage curriculum leaders of undergraduate courses from any discipline to work with their colleagues, industry partners, students and graduates to: define course-wide levels of achievement in key capabilities, articulated through standards rubrics; implement strategies to evidence student achievement of those standards (through student portfolios and course review processes, for example); share the validity, challenges and opportunities of such approaches through scholarly publications. Colleagues are encouraged to access an introduction to these concepts and join a community of practice and scholarship. (More)

Hunters and gatherers: strategies for curriculum mapping and data collection for assuring learning (SP10-1862) (2010)

Assurance of learning is a predominant feature in both quality enhancement and assurance in higher education. It involves making program expectations and standards explicit, then systematically gathering, and interpreting evidence to determine how well performance matches those expectations. This benefits the institution, ensuring program aims are evaluated and used for program development, and is important for external scrutiny (AUQA, TEQSA, professional bodies). This project aims to investigate two elements of assurance of learning: (1) mapping graduate attributes throughout a program; and (2) collecting assurance data. It will conduct an audit across disciplines

subject to accreditation in Australian universities to evaluate current methods of mapping graduate attributes and their impact on the curriculum, and also the systems used to collect and store data. This information will be critically analysed to develop strategy on curriculum mapping and data collection. It will draw upon the use of existing software packages (e.g., SOS - mapping; ReView, SPARK^{PLUS} collection) to support the efficient and effective implementation strategies. ([More](#))

ALTC projects and fellowships completed: specific disciplines

The year at the end of each title is the year funded.

Architecture and building

Generating academic standards for planning practice education (PP6-47) (2006)

This project aimed to investigate academic **standards** within urban and regional planning with a focus on **practice education**. Taking a participative and collaborative approach the study engaged key stakeholders of planning practice education. The project design involved a national scoping and review of planning practice education for 43 accredited undergraduate courses; and an empirical study into the views and experiences of planning educators, practitioners and students. In the area of planning education, despite accreditation, there has not been the development, implementation or dissemination of **academic standards for WIL**. One of the key premises of the project is that **WIL is crucial to the development of planning practitioners** as it provides an opportunity to close the gap between theory and practice. The project aimed to:

- Generate knowledge about the current status in Australia of planning practice and assessment
- Identify the **factors which impede or facilitate the development of a shared understanding of academic standards** in planning practice education
- Present key models and theoretical perspectives for understanding and applying **academic standards** and related assessment in planning practice education
- Institute processes of change for the improvement of academic standards and assessment in planning practice education.

The accrediting body, the Planning Institute of Australia (PIA), encourages the inclusion of professional work experience, although it was not a requirement at the time of the project. At the time of the study, only nine of 43 tertiary institutions had structured work practice as a formal component. The project recognises the impact of the interplay between different issues and agendas on the achievement of academic standards, and the key role of assessment in this process. The project encourages a sophisticated appreciation of academic standards in the learning and teaching process. Furthermore, the project demonstrates an understanding of the complexities involved in ensuring the quality of placements and of appropriate and authentic assessment to measure deep learning. As part of the project outcomes, potential assessment frameworks for structured work placements are provided as well as principles to guide the enhancement of assessment practices and academic standards.

Highlighted resources: The [project report](#) includes scholarly analyses which may be of use in other disciplines, particularly:

- Chapter 3.4 Professional Practice Capability, Pedagogy and Situated Learning and
- Chapter 6 Enhancing Assessment Practices and Academic Standards

Identification of teaching and instructional issues and opportunities for the architecture and associated disciplines (DS6-606) (2006)

This project was a study of architectural education and a detailed overview of architectural schools, academics, curricula and students in Australia, New Zealand and Papua New Guinea. The project explores **four stakeholder groups**: accreditation bodies, architectural practices (employers), community (includes students and their parents), and universities. The changing expectations of these stakeholder groups have had a considerable impact on architectural education over the last two decades and the report argues that accreditation requirements have had a significant impact, so much so that architecture schools are differentiated more by their location than the curriculum or teaching practices. The report provides a significant profile of architectural schools, including the curriculum (weighting, trends and accreditation) and the teaching and learning environment (challenges, design studio, assessment). In terms of graduate attributes and employability, **the rise of generic skills in universities is perceived as having a negative effect on core skills** which academics rated as the most important attributes. In relation to the transference of skills to students, a reduction in **fractional teaching staff** (due to salary and employment disparity between university appointments and architectural work) has meant that one of the main conduits for the transference of architectural practice is reduced. This report also suggests that architectural graduates are initially paid less as they are not seen as fully competent and need to **complete an internship to be work-ready**.

Highlighted resources: The [project report](#) includes scholarly analyses which may be of use in other disciplines, particularly:
- Chapter 6 The Curriculum (including 6.1 Mapping Curriculum Content) and
- Chapter 7 Teaching and learning Environment, especially The Balance Between Core Skills and Generic Skills (p.130)

Identification of teaching and instructional issues and opportunities for the construction management, quantity surveying and building disciplines (DS7-618) (2006)

This project sought to identify the challenges and opportunities for teaching and learning within the disciplines of construction management, quantity surveying and building surveying. The project is a scoping study that provides an overview of the challenges the discipline is currently facing such as: the generalist nature of many of the degrees (in contrast, for example, with structural engineering), and the constraints on curricula imposed by a complex number of varying accrediting professional institutions and industry. The project develops 14 recommendations and many of these reflect common issues facing the higher education sector such as a reliance on sessional staff, succession planning, funding shortages, the **need for increased emphasis on WIL**, Gen Y student profile and demands on student time due to work pressures (as most combine work and study). The relatively new discipline of construction education, however, has particular challenges less apparent for those more established (e.g. architecture or engineering). These include: a need for streamlined accreditation processes, fragmented and overcrowded curricula, a lack of recognition, status and understanding of the field by university management, and a lack of a teaching and learning community and associated organisations. **WIL** is proposed as a solution to issues around graduate employability and to resolve the tension between the demand for vocational skills by industry and a more theoretical focus traditionally provided by tertiary studies.

Highlighted resources:
- project report, Chapter 4 summarises the issues related to curriculum and graduate preparation for industry

Professional education in built environment and design (DS7-615) (2006)

The project aimed to identify, research, review and scope the key issues facing built environment (quantity surveying, construction management, project management, property economics, spatial science, planning, civil engineering) and design (architecture, interior design, industrial design, landscape architecture) education across the sector, starting with five participating universities. The project identified three research questions:

1. How is built environment and design education currently configured to ensure the **work readiness of graduates** for working life in the professions? In this, what works well?
2. What are the **professional futures of graduates** for built environment and design?
3. What do programs and learning and teaching initiatives need to **ensure work-readiness of graduates**?

Significantly, the emphasis on professional education and employability is supported by the inclusion of a number of **professional partners** including GHD, Hassell, Woods Bagot, and Sinclair Knight Mertz. The project used a **stakeholder** approach, also engaging with **new graduates** of Built Environment and Design (BED) disciplines and **academic staff**. Focusing on the quality of the transition-to-work experience the study found that **higher-order graduate capabilities (such as, judgment, critical enquiry and strategic thinking, and emotional intelligence) were stressed by all stakeholders**. According to the study, effective transition-to-work is supported by **authentic undergraduate experiences** (on and off campus). Furthermore, the study found that academics of BED were relatively silent on issues relating to work readiness and standards, which was of concern given the national attention currently given to outcome standards. The silence, the report argues, is a symptom of a lack of discussion rather than implicit agreement. The project identified three recommendations:

1. a national good practice guide and network to help ensure that the transition-to-work of BED graduates
2. a national conversation about transition-to-work for BED graduates to help shape policy and practice
3. development and implementation of a range of transition-to-work strategies

Highlighted resources: The project report includes scholarly analyses which may be of use in other disciplines, particularly:
- 2.2 Defining graduate capabilities and
- Chapters 3 and 4 Stakeholder surveys of the importance and demonstration of graduate capabilities

Engineering and related technologies

Ensuring the supply and quality of engineering graduates with attributes for the new century (DS6-605) (2006)

This project aimed to determine the factors to ensure Australian universities produce a **diverse supply of graduates**, in a sustainable manner, with the appropriate **attributes**

for professional practice within an international, competitive context. According to the project report, a streamlining of the accreditation process has resulted in an increasing emphasis on graduate attributes in first-degree engineering programs. Of the ten graduate attributes identified, some are easier to embed than others but, overall, success seems more likely where the **curriculum and assessment have been strongly aligned with the particular attribute**. The employers consulted in the study, indicated that the softer generic skills—such as written and verbal communication skills, and teamwork—are better demonstrated in current engineering graduates. The report provides six recommendations to ensure Australian engineering education remains competitive and to counter the challenges the discipline faces. They include:

- Clarify the **educational outcomes and standards** required for practice at internationally recognised levels of engineering
- Develop and share best practice engineering education to ensure the required outcomes and reduce student attrition
- Promote stronger collaborative links with industry.

Engineering science and practice: alignment and synergies in curriculum innovation—Professor Ian Cameron—ALTC Senior Fellow (2006)

The fellowship focused on developing an understanding of three principal areas within engineering education:

1. Engineering education takes place in the space between theory and practice
2. The impact of new emerging practice forms on engineering into the future
3. Curricula strategies and processes—underpinned by an understanding of the theory/practice link—to produce **engineering graduates of the future**.

In particular, the fellowship is interested in the theory-practice landscape and the wide variety of spaces and places where engineering students encounter theory and practice. As part of the fellowship, Cameron developed a novel way of mapping those spaces into a curriculum diagram with a particular focus on how well those spaces are able to support the development of the desired graduate attributes for the emerging global engineer. These spaces (desk, studio, library, lecture, laboratory, plant, site, community, and regional practice etc.) are visually represented in terms of their relative size and time spent in them (time-distance scales). The graphical form presented is consistent with engineering culture and Cameron argues will appeal to engineering academics as a way to visualise the curriculum to imagine more innovative pedagogical approaches. He argues that the alignment of theory and practice with emerging learning spaces—combined with pedagogical considerations—are crucial to curriculum design and delivery. As part of the fellowship outcomes, there is a focus on active learning, project work, and peer teaching and significant networks have been developed (nationally and internationally) to extend the dialogue on innovating engineering education with consideration for the changing nature of engineering practice (e.g. the influence of data-centric and model-centric paradigms).

Highlighted resources:
- Synchronized resources (audio, video and slides) are available at Engineering Education Futures Forum 2008 http://www.altcexchange.edu.au/engineering-education-futures-forum-2008-2-outcomesand-activities

Teaching and assessment of meta-attributes in engineering: identifying, developing and disseminating good practice (EMAP) (CG6-23) (2006)

Responding to increasing pressures from industry, professional bodies and universities for engineering faculties to embed graduate attributes, this project aimed to investigate and address the **teaching and assessment of graduate attributes in Engineering** in the face of three inter-related challenges as noted in engineering education literature:

1. Innovations in teaching and learning and embedding graduate attributes tends to be isolated and short lived.
2. Rigorous evaluation of the impact on student learning of graduate attributes is rare
3. Pressures to align engineering graduate attributes with university generic attributes proves difficult, as university attributes do not align well with the realities of engineering practice.

Embedding attributes in the curriculum requires singular vision and commitment. Outcomes include:

- the development of a model for mapping attributes as part of an ongoing curriculum review process for engineering programs
- student perceptions of their learning of systems thinking (identifies the need for more authentic assessment to develop professional skills in this area)
- processes and tools for undertaking engineering curriculum review
- academic perceptions of the challenges associated with embedding graduate attributes in engineering curriculum.
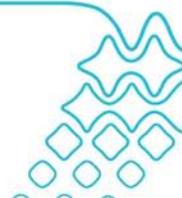
Highlighted resources:

- [Engineering graduate capabilities continuum: a continuum of learning outcomes](#)
- [Engineering Curriculum Review: process overview](#)

Health

Curriculum development and assessment of methods to enhance communication and life skills in veterinary students (PP7-340) (2007)

This project focused on improving veterinary **graduate employability**, specifically **communication skills**, through targeted resources for use in veterinary curricula. The project attempts to fill a gap in veterinary curricula (nationally and internationally) by addressing the need for veterinarians to be able to communicate effectively with their human clients. Traditionally, veterinary studies have focused on knowledge and skills related to working with animals and have failed to appreciate and understand the importance of the human-animal bond and the need for skills in communicating with clients to achieve the best outcomes for their animals. The project aimed to:

- Provide educational tools to develop clinical consultation and communication skills using electronic and live simulation client scenarios
- Provide strategies to assess and apply Human (Client)-Animal bond in consultations
- Provide strategies to enhance and **assess competency in communication, emotional intelligence and selected life skills**; and methods of reporting this (including an **electronic portfolio**).

The project rationale was based on feedback from both veterinary registering boards and employers of veterinary graduates that noted the importance of communication skills within the undergraduate curriculum.

Highlighted resources
The Learning and Teaching Guide: A handbook to support institutions in implementing programs for assisting the development of communication and life skills in veterinary students includes lesson plans, assessment tools and supporting materials.

Developing interprofessional learning and practice capabilities within the Australian health workforce—a proposal for building capacity within the higher education sector (G17-637) (2007)

This project addresses interprofessional education within the Australian higher education sector and its role in producing **graduate health professionals able to meet workforce needs** in the crucial area of health provision. Specifically, the project aims to increase the capacity of the sector to graduate health professionals who have acquired well developed **interprofessional capabilities** by describing current interprofessional education (IPE), interprofessional practice (IPP) and interprofessional learning (IPL) in Australia and identifying a national research and development agenda that takes into account key workforce issues. Building a health workforce that can work more effectively in **team-based, interprofessional and inter-disciplinary practice** to deliver safer, sustainable, more effective, patient centred health services requires that students must be provided with IPE learning experiences. Changes to health care such as an increased need for enhanced community roles and greater cooperation between health professionals in patient assessment and management have led to an emphasis on interprofessional learning within the health professions. Interprofessional learning, however, presents certain challenges. Discipline bias, for example, is a barrier to successful IPE and, significantly, IPE also demands philosophical changes to educational norms and traditions. As a consequence, there tend to be pockets successful innovative IPE practice across the sector (usually the result of local champions), which is neither sustainable nor able to meet workforce needs. The project provides four national development areas, eight associated actions and two enabling strategies to achieve increased IPE, IPP and IPL.

Highlighted resources:
The Australasian Interprofessional Practice and Education Network includes a wealth of resources, and an active network of individuals, groups, institutions and organisations committed to researching, delivering, promoting and supporting interprofessional learning, through interprofessional education and practice, across Australia and New Zealand.

Ensuring quality graduates of pharmacology (DS7-621) (2007)

This project aimed to undertake a national survey and conduct structured interviews and consultations with stakeholders with a view to identifying resources, needs and priorities, including **generic graduate attributes**, defining minimal pharmacological knowledge in professional degrees and informing curricula development. The project findings indicated that there was a diversity of opinions as to what defined the discipline of pharmacology. Part of the project's study was a national survey of students, asking the question "Does pharmacology teaching **adequately prepare graduates for their chosen career**?" Students perceived pharmacology as relevant to their chosen career and preferred practicals and tutorials over self-directed learning and computer assisted

learning. Wet labs were also deemed very useful and relevant. It should be noted, however, that overall, response rates were sometimes quite low

Facilitating the integration of evidence based practice into speech pathology in Australia (DS7-611) (2007)

The primary aim of this scoping project was to develop a clear understanding of the current state of evidence based practice (EBP) teaching and learning in Australian speech pathology programs. The project explored both academic and clinical teaching and learning contexts. Based on the literature that demonstrates that novice clinicians find **clinical decision making skills** challenging to develop, the project assumes that EBP bridges academic and clinical curricula and should form the basis for clinical decision making. Using an action research methodology, the project found that there were strengths and gaps in existing practices. Strengths included: academic staff and clinical educators are positive about EBP having had training and access to relevant resources; EBP is assessed and considered in curriculum design and educators use a variety of processes to teach EBP. Gaps included dissonance between knowledge and action; for example, students found it easier to include EBP in academic assignments rather than real clinical settings.

Highlighted resources:
Evidence based practice resources online, as well as links to EBP resources (p.75 of the project report)

Mapping the future of occupational therapy education in the 21st century: review and analysis of existing Australian competency standards for entry-level occupational therapists and their impact on occupational therapy curricula across Australia (DS7-614) (2007)

The project aimed to develop recommendations for revised competency standards for entry level occupational therapists (OT). The project undertook a scoping investigation to provide a basis for future directions, practice and scholarship within OT university education. Academics within the discipline navigate national, international and local registration requirements, cross-disciplinary research domains and diverse contexts for clinical practice in creating a coherent, research-led curriculum. There are also three key drivers of Australian OT curricula: the Australian Competency Standards for Entry-Level Occupational Therapists, the Revised Minimum Standards for the Education of Occupational Therapists (2002) and the home university's generic graduate attributes. The project was intended to provide a timely investigation into OT competency standards. The project report provides detailed information on the results of the study involving the standards document (its relevance), suggested review timing (5 yearly), the format of the document and what should constitute entry-level competency. The majority of those involved in the online survey agreed that there was considerable **compatibility between university graduate attributes and the OT discipline-specific competencies**.

Meeting the challenges of clinical exercise science and practice: a collaborative university-industry approach (DS7-612) (2007)

Clinical exercise physiologists work with clients with chronic medical conditions. Exercise is now accepted by both the scientific and medical communities to be highly
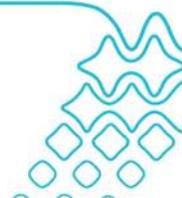
therapeutic for those with chronic conditions and, in 2006, the federal Department of Health and Ageing formally recognised the entry of Accredited Exercise Physiologists (AEPs) into the domain of allied health to deliver Medicare-rebated services for those with chronic diseases. Due to this increased interest in, and recognition of, clinical exercise physiologists or AEPs the project aimed to address deficiencies both within the profession and across the higher education sector. The deficiencies in curriculum included the fact that practitioners are educated through courses designed in the 1990s, with a focus on working with healthy clients and athletes. The project aims included:

- Benchmarking the education and training of the Australian exercise physiologist (AEP) against established allied health professions
- Scoping gaps in curricula and clinical placements across the sector
- Developing new knowledge and competency accreditation criteria to propose to the Australian Association for Exercise and Sports Science
- Devising a strategy to align courses with the new accreditation system for individual practitioners
- Designing clinical practice guidelines and systems.

The 12 month project made considerable progress towards achieving its aims.

Highlighted resource:
project report appendices include a methodology for benchmarking courses

Paramedic education: developing depth through networks and evidence-based research (DS7-616) (2007)

This project was the result of collaboration between nine Australian universities. The two major educational issues the project identified were:

- differences between industry and universities about what determines work readiness or road-readiness (in the case of paramedics)
- the need to identify a signature paramedic pedagogy drawing on a reference to Shulman (2005) who argues that graduates should bring a sense of **personal and social responsibility (through integrity, ethical and responsible behaviour**).

Paramedic education is relatively new to universities (1994) and the majority of teaching academics are experienced paramedics. Opinions differ between service providers and universities as to whether graduates should be work-ready or require internships to prepare for practice. Clinical placements are crucial to paramedic training yet opportunities are limited, variable, costly, and there was a great deal of competition with other health disciplines for placements. Transitional (mentoring and apprenticeship) structures to support graduates to become road-ready were found to be important. Within the project there is a strong emphasis on collaborative engagement between service providers and universities and the Australasian Paramedic Academic Network has been developed as a means to improve collaborative links and disseminate best practice learning and teaching within the discipline.

Quality indicators for best practice approaches to experiential placements in pharmacy programs (DS6-608) (2006)

This project mapped **experiential placements** including learning objectives, teaching and learning activities and assessment processes across pharmacy schools in Australia to highlight successful practices and to identify areas for improvement and quality indicators. The project sought to discover the value of placements in pharmacy
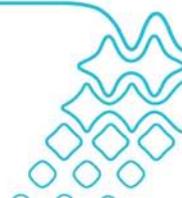
education, which have traditionally been seen as crucial, even though little research has been undertaken to determine their efficacy in preparing students for entry into the profession. Influences such as an ageing population, changes to the overall health workforce and a rapid demand for new services require that pharmacists demonstrate discipline-specific skills and also highly-developed **interpersonal and problem solving skills** along with the ability to adapt and respond to changing health needs. Pharmacy accreditation bodies provide competency **standards**; however, these standards are often evident in the curriculum implicitly rather than explicitly. The project provides a table that **maps pharmacy competencies against three typical universities' graduate attributes** (p.33) and argues (based on the literature) that placements are particularly relevant to enhance oral and written communication, problem-solving, analysis, critical evaluation, information literacy, teamwork, ethics, leadership, and decision-making. In fact, pharmacy competencies, although embedded in the curriculum prior to final year placements, are primarily assessed during placement. The project report provides an excellent overview of experiential learning theory in relation to placements and provides best practice examples for preparing students, assessment, broadening placement opportunities, and the evaluation and quality indicators for pharmacy placements.

Highlighted resources:
project report includes excellent materials on **experiential learning, assessment and reflective learning**, including examples from other disciplines (Chapter 3)

Safeguarding Australians: mapping the strengths, challenges and gaps toward sustainable improvements in learning outcomes from diverse models of ohs education (DS7-622) (2007)

The overall aim of this project was to facilitate the alignment of occupational health and safety (OHS) education with evolving **workforce requirements** by providing an evidence base from which informed decisions can be made. Using an action research methodology an online survey instrument (qualitative and quantitative items) was developed to gather stakeholder perceptions. It should be noted that professionals were overwhelmingly represented in the survey (420), whilst 22 educators, 31 Registered Training Organisations and only 21 graduates responded. The project outcomes have included the establishment of the Academy of OHS Education and Research as a community of practice, which has been embraced by the Safety Institute of Australia and embedded within the OHS Educators' Chapter. The Safety Institute of Australia has committed funding to support the Academy into the future. Four objectives have been identified for the Academy, and they include: through engagement with key stakeholders, the **identification and development of core learning outcomes** from university-based OHS programs in Australia. The project identified three guidelines for the sustainable development of university education for generalist OHS professionals: generalist OHS professionals need university education, generalist OHS professionals need a multidisciplinary grounding, and they also need a work-integrated-learning model of education.

Information technology

Managing educational change in ICT discipline at tertiary education (DS6-600) (2006)

This project is described as a scoping study in ICT higher education. Taking a

stakeholder approach, the project identified three key stakeholder groups from whom to collect data on their perceptions of ICT curriculum: academic staff, recent graduates and employers. Academics struggled with an overcrowded curriculum, having to include technical knowledge whilst at the same time developing **generic attributes**. Work integrated learning was seen as particularly desirable as a means to provide authentic learning experiences. The study found that there was a disparity between the abilities identified as important to a graduates' performance at work and graduates' own perception of how well their university course was in developing those abilities (including communication, teamwork, problem-solving, the organisation of information, project management, client liaison and technical expertise). Many graduates identified that universities had failed to adequately develop their interpersonal and personal skills, and business and industry knowledge. Most employers were happy that graduates were competent in ICT knowledge but identified weaknesses in communication and problem-solving, self-management, initiative, planning abilities and independent learning. Teamwork, however, was regarded as well developed.

Management and commerce

Accounting for the future (DS7-619) (2007)

This project took a stakeholder approach to identifying the **non-technical, or soft-skills (eg communication, interpersonal and critical thinking skills) required by accountants** in the next five to ten years. Stakeholders included: employers of accounting graduates, professional accounting bodies, the public sector, and recent and current accounting students. The project aimed to:

- Identify the general consensus as to the relative importance of key technical and non-technical skills for graduates of professional accounting programs who have to meet the challenges of the profession over the next five to ten years
- Identify the range of non-technical skills required of professional accountants over the next five to ten years
- Identify examples of best practice for the embedding of relevant non-technical skills in professional accounting programs

Results showed that while technical skills are crucial, **non-technical skills such as** communication, teamwork and self-management **are very important**, particularly in larger organisations. Those graduate skills perceived as least developed were communication and problem solving.

Highlighted resources:
- Strategies for embedding non-technical skills into the accounting curricula

Business as usual: a collaborative and inclusive investigation of existing resources, strengths, gaps and challenges to be addressed for sustainability in teaching and learning in Australian university business faculties (DS6-604) (2006)

This project aimed to identify disciplinary strengths, gaps and challenges within the discipline of business. In collaboration with the Australian Business Deans' Council, it sought to identify areas where more funding could be sourced to improve the quality of student learning. Ten key learning and teaching issues were identified, and of this ten, three were clustered and prioritised for immediate action including:

- Building **professionally-relevant learning and industry engagement** in the business curriculum

- **Building and assessing the development of generic skills** across the business curriculum
- Valuing quality teaching in business education.

The project emphasises **core knowledge, graduate attributes, assessment and employability achieved through curriculum mapping and constructive alignment**. Similarly, the complexities of both WIL (and the competition for work placements) and embedding and achieving graduate attribute outcomes are acknowledged.

Highlighted resources:
- Literature review of Business teaching and learning issues, including graduate and generic skills, <u>project report</u> (Section 4)

Facilitating staff and student engagement with graduate attribute development, assessment and standards in business faculties (PP7-322) (2007)

The aim of this project was to promote graduate attribute development in **Business** education through engagement of staff and students with **learning and assessment processes that embed graduate attribute development** through a two part approach:
- Using the online assessment system, ReView, staff engaged with graduate attributes within set assignments
- students were then encouraged to engage with the attributes through self-evaluation of their performance for each criterion.

A social constructivist approach to graduate attributes was adopted, whereby assessment processes, criteria and standards were framed within an active engagement and participation of staff and students. For this project, graduate attributes were defined as **a broad range of personal and professional qualities and skills, together with the ability to understand and apply discipline-knowledge**. Outcomes include
- an increase in staff awareness of graduate attributes, developing assessment criteria and establishing feedback mechanisms aligned with graduate attributes
- improved student awareness of graduate attributes and understanding of assessment criteria
- implementation of online moderation, and
- development of a community of practice.

Lessons learnt
- Graduate attributes need to be specifically related to student learning to be valued and recognised. This can be achieved by aligning the attributes with the curriculum when discussing assessment requirements in the unit or by incorporating the business employer perspectives in relation to the graduate attributes.
- Academic staff require several iterations of support to develop adequate assessment criteria that relate to graduate attributes.
- Business academics are more likely to fully engage in graduate attribute development and assessment if the process is clearly linked to professional development and is presented as an appropriate and legitimate method for advancing individual staff immersion in cutting edge pedagogical thinking.
- Any online assessment system needs to be used with care or support as instrumental approaches.

Highlighted resources:
- Project website <http://datasearch.uts.edu.au/site_manager_sites/business2008/teaching/staff/EGA.html>

Natural and physical sciences

Extending teaching and learning initiatives in the cross-disciplinary field of biotechnology (DS6-601) (2006)

This project was a scoping study aimed at identifying gaps and opportunities for improvement of biotechnology learning and teaching in higher education in Australia. The project identified a number of factors with significant potential to impact on biotechnology learning and teaching, including:

1. Relationships between university **programs and industry**, including placement of students for vital industry experience and supporting a growing professional identify within the industry
2. The inherently interdisciplinary nature of biotechnology degree programs within discipline-based universities and scientific communities
3. Pressures and opportunities within the university for improving teaching in areas such as **graduate attribute development**

According to this report, biotechnology programs need to focus on developing the skills required for integrating discipline expertise into the environment of biotechnology and on **developing adaptability and problem solving** in graduates. Graduates will need to be flexible, strong in core knowledge, and also quick to pick up on new technologies and apply them to an industry context. The report identifies **fieldwork and other WIL learning experiences** as an important element in developing such graduates. The first three years of the Flinders, Monash and UQ degrees were **mapped** against generic attributes. The mapping exercise showed that **ethical skills** were the attributes least well attended to, along with **personal and interpersonal skills**.

Highlighted resource:
A pilot of graduate attribute mapping across three courses ([project report](#): Appendix 4).

Forging new directions in physics education in Australian universities (DS6-607) (2006)

This project focused on service teaching, undergraduate experimentation and **graduates in the workforce**. In *graduates in the workforce*, the project identified graduate destinations and employer expectations as a means to explore current course structure and learning activities. The key results included the recognition that graduates of physics had good **problem solving skills**. However, other skill sets such as **communication and planning** were less developed.

Highlighted resource:
- Graduates in the workforce [report](#)

Programmatic approach to developing scientific writing embedded in BSc courses—Dr Roger Moni—ALTC Associate Fellow (2007)

This fellowship aimed to enhance the teaching and assessment of **written communication** in the Bachelor of Nursing through engaging university staff with professional development with the framework identified. The framework to explore writing in the nursing curriculum incorporates:

- Study Skills (lowest level, where writing is taught and assessed)
- Academic Socialisation (students achieve standard required levels of writing underpinned by scholarship) and
- Academic Literacies (students are able to travail different academic writing genres and are acculturated into discipline specific academic writing styles).

The fellowship and associated activities are predicated on the notion that writing plays

an important role in the development of reflective and higher-order thinking.

Highlighted resources
- An [EndNote database](#) of references on writing in nursing education

Re-conceptualising tertiary science education for the 21st Century (DS6-598) (2006)

Based on the assumption that laboratory work is central to science education, this project aimed to determine the value of current teaching methods in laboratories. To achieve this, the project researched, through a grounded theory approach, what is happening in first-year laboratory sessions and how it is happening. The study looked at a range of science disciplines (chemistry, biology and physics) and focused on first-year mainstream laboratory work in nine universities. The project found that academics had little awareness of employment opportunities for science graduates and that there was little, if any, acknowledgement of the diversity of students' backgrounds in science. The study also found that most laboratory demonstrators were graduate students who had little or no training or induction. Due to a lack of knowledge about teaching and learning laboratory classes were thus reduced to a transmission model. Exceptions existed but this was the result of individual efforts and a personal interest in teaching and learning. The project developed nine recommendations that address four areas including: the assumptions behind laboratory work and laboratory classes as a unique learning environment, first-year student profiles, generic skills in the laboratory, demonstrators, and the use of simulation.

Highlighted resource:
- Generic skills in the laboratory ([project report](#), commencing p.57)

Society and culture

Benchmarking archaeology honours degrees at Australian universities (PP6-53) (2006)

This project developed subject benchmarks for archaeological qualifications, acknowledging that there are perceived shortcoming in archaeological degrees by both **students and employers**. A four year Bachelor degree with Honours is seen as the fundamental level of academic achievement required to gain entry into the profession of archaeology, hence the project's focus on an Honours degree. The project aimed to bring academics responsible for teaching archaeology together to determine **standards**, arguing that it should be academics, not employers, responsible for determining the learning outcomes of archaeological degrees. The major product of the project is the document *By degrees: Benchmarking archaeology degrees in Australian universities*. This document was drafted by a representative working group from all Australian university providers of archaeology and is the first of its kind. According to the authors, it provides a shared understanding of student learning outcomes within the discipline and should support the **development of common expectations of graduates**.

Designing a diverse, future-oriented vision for undergraduate psychology in Australia (DS6-603) (2006)

This project built on a fellowship ("Sustainable and evidence-based learning and teaching approaches to the undergraduate psychology curriculum") as well as ALTC "Learning Outcomes and Curriculum Development in Psychology". The project aims

included **developing and articulating graduate attributes for psychology education**. Within the project there is a strong emphasis on graduate attributes, their alignment with accreditation requirements, and the alignment of assessment and learning outcomes within a graduate attribute framework.

Highlighted resources:
A resource to support academics wishing to embed graduate attributes, including formative and summative assessment processes, is available at the [Australian Psychology Accreditation Council](#).

Developing an integrated national curriculum for the education of the social work and human services workforce (DS7-627) (2007)

The project analyses the national curriculum and workforce needs of the social work and human services. Rapid growth in the social work and human services workforce has meant that there is an undersupply of professionally qualified social work and human service practitioners. Furthermore, the ageing workforce presents challenges as current practitioners retire, limited career and salary structures create disincentives to recruitment and retention, and there is a highly diverse qualification base across the workforce (which fails to match the specialist knowledge and skills required of practitioners). The project was a scoping study which aimed to:

- Provide an overview of the changing higher education and vocational training policy context and analyse the implications for social work and human services education in the higher education and VET sector
- Analyse the structure and curriculum content of social work and human services curriculum across Australia
- Outline **workforce outcomes** and trends relevant to the social work and human services workforce
- Identify the key curriculum and workforce issues facing the sector
- Present recommendations for addressing these issues, including recommendations for improving the **integration of curriculum and national workforce planning** in the rapidly expanding social work and human services workforce.

Social work degrees are subject to accreditation by the Australian Association of Social Work, and programs must meet certain curriculum requirements including at least 400 hours of **supervised field education**. Generally speaking the emphasis is on undergraduate programs as postgraduate program are limited. Due to a **lack of employer involvement with curriculum** there has been criticism from employers regarding an overemphasis in tertiary qualifications on theoretical considerations. Finally, the project provides a number of recommendations which are related to managing workforce needs.

Learning and teaching in the discipline of law: achieving and sustaining excellence in a changed and changing environment (DS6-597) (2006)

Conducted under the auspices of the Council of Australian Law Deans (CALD), this project closely examined a number of areas associated with high-quality learning and teaching outcomes for a diverse range of law students including: **graduate attributes, ethics, professionalism** and service, **standards**, building sustainability, and exploring issues of law student mental health. The project adopted a stakeholder approach and engaged CALD members, legal academics and law students. The project is, in effect, a scoping study of learning and teaching practices in the 32 existing Australian law schools. As part of this study, **graduate attributes from UTS are mapped against 18 core law subjects** and the project outlines different levels of achievement in different law schools in **embedding and assessing graduate attributes**, although those
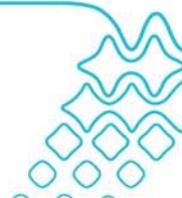
attributes are sometimes university attributes and sometimes discipline attributes. The project reports a range of practices from limited engagement with graduate attributes to highly developed (clearly aligned learning outcomes, assessment and the production of rubrics). There is a recognition in the project report that systematic approaches to mapping graduate attributes, their assessment and scaffolding across the degree program is required if the desired capabilities are to be developed in law students with a high value placed on professional skills and attitudes (ethics, professionalism and service).

Highlighted resources:
- project report, Chapter 5: useful background information on graduate attributes, including strategies for teaching staff engagement
- Some innovations in assessment in legal education

Sociology in Australia: a scoping study (DS7-623) (2007)

The aim of this scoping study was to gain an overview of the extent and nature of sociology teaching in Australian universities and some understanding of the most pressing issues faced by teaching staff. The study found that most of the 37 public universities (all but 2) offered sociology subjects. Significantly, despite this presence sociology as a discipline is not visible and this positioning mirrors the discipline's character. The "mapping" of sociology subjects was carried out through perusing university websites and contacting relevant staff. The project reports that it was often difficult to gather information as it was not readily available and attempts to contact sociology staff were sometimes unsuccessful. The majority of the issues facing sociology are consistent with issues facing higher education. Sociology also has specific challenges related to the discipline which include identity issues and fragmentation (relating to different schools of theory within sociology), and a general lack of definition due to the reflexive nature of sociology.

Teacher education

Developing primary teacher education students' professional capacities for children's diverse mathematics achievement and learning needs (CG8-737) (2008)

This project aimed to enhance the capacity of primary teacher education students' to cater for the diverse achievement and learning needs of primary school students in the discipline of mathematics. Diversity is used within the project to refer to children's ages and achievement levels, interests, backgrounds, learning styles, learning and social skills, rates of learning, and learning environments. Indigenous children and children in regional, rural and remote locations in Western Australia were also considered diverse in the context of the project. Drawing on the assumption that mathematics teaching has changed little over time, the project recognised the need for enhanced teaching strategies particularly for students from diverse backgrounds. The project was underpinned by two action research cycles within the Bachelor of Education (Primary and Early Childhood) programs at Curtin University. The project used authentic learning and assessment tasks to demonstrate an improvement in the students' capacity to better cater for diverse learning needs in primary school mathematics. The project demonstrated that **aligning the assessment with the attributes or capabilities required of the graduate** enhanced the students' capacity in that area. Furthermore, providing authentic learning opportunities strengthened achievement. For example, the students were able to demonstrate an increased awareness and

understanding of the impact of diversity on learning styles and a wider array of strategies and factors in teaching mathematics   including: using a variety of groupings, using open-ended tasks, extending or simplifying tasks, using a range of materials, considering children's interests, cultural and social backgrounds, and being reflective and flexible as a teacher. Significantly, the project appears to have **enhanced other generic capabilities** including increased ability to problem solve, increased critical thinking, and a greater capacity for reflection.

Highlighted resources:
Resources for primary education available [here](#).

Practicum partnerships: exploring models of practicum organisation in teacher education for a standards based profession (PP7-323) (2007)

This project examined the **professional learning experiences** of secondary education pre-service teachers in programs offered by eight higher education providers in Victoria. Informed by the Victorian Institute of Teaching (VIT) Professional Standards for Graduating Teachers, the study explored the placement component of teacher education as well as issues related to curriculum, feedback and assessment processes and resourcing for placements and their coordination. The findings of the study demonstrate that the **practicum component needs to be aligned with the VIT Professional Standards for Graduating Teachers** as more often than not their alignment with the placement requirements or expectations tended to be coincidental rather than deliberate. Supervising teachers also needed more support and training to ensure that they understood the goals of placement in relation to these standards. The report also calls for more monitoring of placement quality as student teachers experience appeared to vary tremendously dependent on their placement and the context in which it was experienced (i.e. which supervising teacher they received and which school they were placed at). Resourcing placement programs was also identified as an issue relating to improving the quality of the learning experience for student teachers whilst on placement. The project findings reflect issues common to many placement or fieldwork programs around resourcing, managing relationships, moderating assessment, educating and communicating with placement supervisors expectations, and educating and communicating expectations for students. The report includes seven detailed recommendations that deal with aligning the placement with the VIT Professional Standards for Graduating Teachers across a range of important factors relating to the **achievement of professional capabilities** (e.g. summative and formative assessment, curriculum issues, length of placement, more effective placement coordination, effective resourcing).

ALTC projects and fellowships in progress: specific disciplines

The year at the end of each title is the year funded.

Architecture and building

Authentic assessment of students in practice settings: a participatory design approach (PP10-1784) (2010)

This project will develop an approach to documenting assessment of practicum practices and design an online system to enable continuous review and improvement of such assessment for the professions of teaching and social work. Professional practicum in authentic practice settings, and its assessment, are critical to the education of students in many professions, including teaching and social work; it enables students to move from intellectual understanding to its application in practice. While compliance with professional standards is required, the diverse and variable nature of practice settings, as well as the subjective nature of professional judgment involved, means that consistent and equitable assessment presents both challenge and stress for many practitioners and educators. By using a participatory approach to the design of assessment, this project will develop a design pattern methodology and a number of tools to assist with documenting, reviewing and improving assessment practices. Another outcome will be a compilation of current assessment practices in Australian universities. ([More](#))

Facilitating WIL through skills-enabled e-portfolios in the disciplines of construction and nursing (PP9-1283) (2009)

The professional institutions accrediting the construction management and nursing professions have developed well defined competency requirements. These disciplines are therefore in a similar position to provide students with opportunities to relate these competencies to the skills they develop during their time at university, (including their work integrated learning (WIL) and other life experiences) through e-portfolios. This study will develop a design brief and specifications for a resource that will be readily transferable to other disciplines. ([More](#))

Health

Curriculum renewal and interprofessional health education: establishing capabilities, outcomes and standards (PP10-1741) (2010)

This proposal responds to the urgent need for curriculum renewal in health education - in particular, the need to graduate students from all health professions with well-developed interprofessional practice (IPP) capabilities. IPP capabilities are identified as essential for delivering health services that are safer, more effective, and more sustainable. Significant interprofessional education (IPE) initiatives have occurred internationally. However, within the Australian higher education context, IPE remains relatively undeveloped, and is not well integrated with core elements of the curriculum. In addressing this national challenge, the project will contribute in two areas. Firstly, it will produce and disseminate a range of IPE curriculum resources: a curriculum framework, generic capability statements, learning

outcomes and assessment methods. Secondly, it will produce and disseminate resources to guide and support curriculum change. To maximise stakeholder buy-in and uptake, the project will build on existing curriculum development initiatives and utilise participatory methods. ([More](#))

Harmonising higher education and professional quality assurance processes for the assessment of learning outcomes in health (SP10-1856) (2010)

The outcomes of the ALTC Learning and Teaching Academic Standards project have reinforced the importance of ensuring ongoing alignment between threshold learning outcomes and professional accreditation standards. This harmonising project will work across, and with, higher education institutions and healthcare professional accreditation agencies to identify and match the goals and expectations of educational, professional and governmental institutions in relation to quality assurance activities. Within a framework that is organised around the threshold learning outcomes, information will be captured about teaching and learning practices, designs and environments, and assessment approaches that underpin contemporary healthcare professional education. The project will specifically focus on a subset of health professions including medicine, dentistry, nursing and physiotherapy as demonstration disciplines. A detailed analysis within each of these demonstration disciplines will directly inform development of the framework that can subsequently be more widely adopted. ([More](#))

Natural and physical sciences

New media to develop graduate attributes of science students (CG9-1111) (2009)

This project will enable science students to gain new media communication skills, preparing them to be professionals who can engage the public on issues involving science. The students will learn from science lecturers coached by science communication academics. This partnership enables science communication to be addressed within core science subjects. Members of this cross-disciplinary community of practice will engage students in a multimedia web publication as a form of authentic learning, a favoured avenue for graduate attribute development. Participatory design of teaching materials will include 'early adopter' science lecturers recruited at conferences and university workshops. Recruits will be trained to be agents of change, coaching colleagues on these new teaching methods and materials. Evaluation will assess learning impact, ease of use of teaching/learning materials, and quality of the multimedia web publications. Dissemination will occur through workshops and online. ([More](#))

Society and culture

Employability of Bachelor of Arts graduates (CG9-1156) (2009)

This project builds on the ALTC-funded BA scoping project, which identified five key models of the contemporary BA and noted that arts graduates are not a homogenous cohort in terms of their employability prospects. The main focus of this

project is to conduct in-depth research into selected Australasian case studies of BA programs, in different institutional and geographic contexts, in order to provide insight into the employability of graduates in these different settings. Interviews will be conducted with employers, students and academics. These case studies will be complemented by comparative, but less detailed investigations into a broader suite of BA programs across a number of Australian universities. It is anticipated that this broad coverage of BA programs will provide a robust underpinning to the findings of this study which will be disseminated throughout the sector. (More)

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