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Will students notice the difference?
Embedding graduate capabilities in the curriculum

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This paper describes the way in which Macquarie University is implementing graduate capabilities in the curriculum. It asks: What potential is there for graduate capabilities defined at an institutional level to improve student experience? In embedding graduate capabilities in the curriculum, is it possible to move beyond rhetoric and enact positive changes for learning and teaching? Without academic and student engagement, any changes are likely to have a limited impact. There are three key challenges involved: *interpreting* the guiding principles and graduate capabilities in terms that are meaningful and relevant to different disciplines; *embedding* graduate capabilities in the curriculum at unit and program level through constructive alignment; and *demonstrating* that units and programs provide students with opportunities to develop the desired capabilities. Three case studies – from Chiropractic, Health Studies and Accounting – are presented to demonstrate the importance of a discipline or program specific approach in the implementation phase to ensure that students notice the difference.

Keywords: graduate capabilities, curriculum, student learning

Discussing the findings to date from the National Graduate Attributes Project, Barrie concludes that "there remains a 'national gap' between the rhetoric of graduate attributes and the reality of the student learning experience" (Barrie, 2008, online). This paper describes the way in which Macquarie University is implementing graduate capabilities in the curriculum to avoid this gap. It asks: What potential is there for graduate capabilities defined at an institutional level to improve student experience? In embedding graduate capabilities in the curriculum, is it possible to move beyond rhetoric and enact positive changes for learning and teaching?

We present three case studies showing the initial interpretation phase of embedding graduate capabilities into the curriculum. The case studies include Chiropractic, Health Studies and Accounting, representing a variety of disciplines, and chosen because they demonstrate different approaches.

In the discussion around graduate capabilities, the terms generic, core, key or transferable, and competencies, skills, attributes or capabilities are often used interchangeably (e.g. Barrie & Jones, 1999; Jones, 2001). Macquarie has chosen the term "graduate capabilities", because it can be defined more broadly than skills, attributes or competencies, and encompasses the ability to perform actions, as well as being the sum of expertise and capacity. Stephenson suggests that capable people "not only know about their specialisms; they also have the

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confidence to apply their knowledge and skills within varied and changing situations and to continue to develop their specialist knowledge and skills long after they have left formal education" (Stephenson, 1998, p. 3). It may also be understood to represent potentialities and possibilities, rather than pre-defined outcomes. Macquarie's framework for graduate capabilities is illustrated in Figure 1.
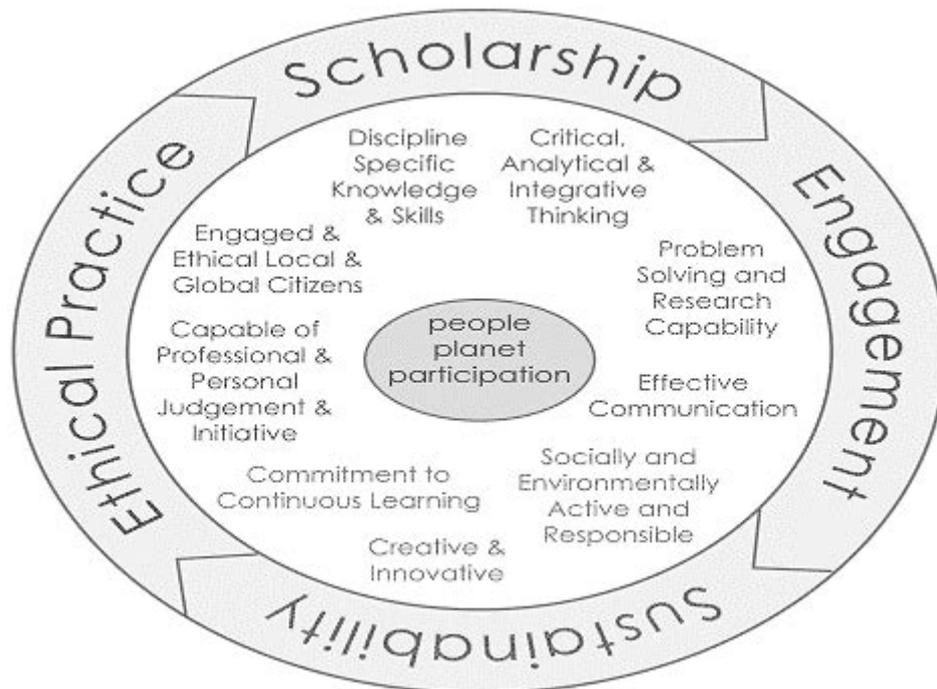

Figure 1: The Macquarie University graduate capability framework

Many Australian universities have a defined set of graduate attributes or capabilities. Research has demonstrated that embedding these attributes or capabilities in day-to-day teaching has been "sporadic, patchy or lumpy" (Hughes & Barrie, 2009, online). Harvey and Kamvounias describe the "success of embedding attributes" (or capabilities) as "extremely elusive" (Harvey & Kamvounias, 2008, p. 34). Although the reasons vary, difficulties may occur because "academics often do not share understandings of the terms used" or "how graduate attributes can or cannot be integrated into the curriculum" (ibid, p. 34). Macquarie has addressed this issue by involving as many academics, general staff and students as possible in the working party that established the guidelines, principles and plan for implementation for graduate capabilities. This ensures a sense of ownership by the university community, and assists in the dissemination process.

Without academic and student engagement in embedding and assessing graduate capabilities any changes are likely to remain largely rhetorical with minor or limited impact on learning and teaching or on the student experience. Hughes and Barrie note this problem, and emphasise the importance of alignment between learning outcomes, teaching activities and assessment, with students "actively involved in directing their own learning through negotiation of assessment tasks, collection of evidence of progress in relation to specific attributes, submission of well-founded claims of achievement and engagement in dialogue about progress with teachers and peers" (Hughes & Barrie, 2009, online). The emphasis at Macquarie is to integrate graduate capabilities into the specific context of a discipline or program, to ensure a major impact on learning and teaching.

The process of embedding graduate capabilities

An audit of two student programs was undertaken prior to the formal introduction of graduate capabilities. The audit involved examination of the unit guides and attempted to retrofit the newly defined graduate capabilities. The research revealed that most of the capabilities were already addressed, at least to some degree, in these programs (Table 1). Graduate capabilities such as "*discipline specific knowledge and skills*", "*critical, analytical and integrative thinking*", "*problem solving and research capability*" and "*effective communication*" are common to all or almost all units in both programs. This is to be expected as they form the basis of most academic work.

The exercise further demonstrated that incorporation of more than half the capabilities into the existing curriculum was patchy, with some capabilities found in only a small number of units, and only some aspects of the individual capabilities explored in most. The graduate capabilities "*ethical and engaged local and global citizens*" and "*commitment to continuous learning*" occurred in only a very few units, whilst "*socially and environmentally active and responsible*" scored relatively highly because it incorporates team-work and leadership skills. In some instances, although detectable in descriptions of the unit, the teaching methods or assessment, many aspects of the capabilities were implicit rather than explicitly developed.

Nonetheless, it is clear that some programs will be able to adapt more easily than others to integrating graduate capabilities into the curriculum. The two programs audited for this study show clear differences in some areas, especially with "*creative and innovative*", "*socially and environmentally active and responsible*" and "*capable of professional and personal judgment and initiative*". This partly relates to the subject matter of the programs (Program 2 deals with environmental management), perceived constraints from accreditation requirements (for Program 1), the teaching methods employed, and, to some degree the size of cohorts in programs (Program 1 has a much larger student cohort than Program 2). These aspects may have significant implications for the ease with which the graduate capabilities are interpreted, taught and assessed in some programs.

There are three key challenges in establishing graduate capabilities at the core of the curriculum:
- *Interpreting* the guiding principles and graduate capabilities in terms that are meaningful and relevant to academics in different disciplines. This needs to occur at the faculty, discipline and/or program level.
- *Embedding* graduate capabilities in the curriculum at unit and program level through constructive alignment of learning outcomes, learning experiences and assessment tasks.
- *Demonstrating* that units and programs provide students with opportunities to develop the desired graduate capabilities.

Embedding graduate capabilities necessitates a process of interpreting and translating each of the capabilities into a discipline specific context, which assists in developing a shared understanding within the same discipline. These might need further refinement at the program level. Bowden et al. (2002, online) go further, with the statement that "the development, practice and assessment of [capabilities] is most effectively achieved within the context of discipline knowledge". It is therefore vital that the learning and teaching of graduate capabilities occurs at the program and especially at the unit level if there is to be any degree of success in embedding the capabilities in everyday student learning experiences.

Table 1: Comparison of individual student programs from different faculties, prior to the introduction of graduate capabilities across the university

Graduate capability	Program 1			Program 2		
	Presence in leaning outcome from 16 unit guides	Presence elsewhere in unit guide	%	Presence in leaning outcome from 16 unit guides	Presence elsewhere in unit guide	%
Discipline specific knowledge and skills	12	4	100	14	2	100
Critical, analytical and integrative thinking	13	2	94	14	1	94
Problem solving and research capacity	12	3	94	14	1	94
Creative and innovative	4		25	1	9	63
Effective communication	13	1	87.5	14	2	100
Engaged and ethical global and local citizens	1	2	19	3	2	32
Socially and environmentally active and responsible *[note: includes team work and leadership]*	7		44	10	4	87.5
Capable of professional and personal judgment and initiative	4	2	37.5	6	8	87.5
Commitment to continuous learning	3	1	25	4	1	32

Case studies

The first step in translating and interpreting graduate capabilities varies according to discipline, as well as the way the program is structured and how it responds to external influences. The three programs described in this study chose different starting points and adopted different approaches. Chiropractic began with their accreditation requirements and sought to interpret these in the light of the graduate capabilities. Health Studies examined the employer expectations and needs via a survey as a basis for mapping the curriculum and Accounting started by attempting to recognise what was already being done in their program.

The Chiropractic program
The Chiropractic program needs to satisfy stringent accreditation requirements, necessitating alignment of accreditation statements with graduate capabilities before any further translation can be attempted. Table 2 shows selected examples of some 33 statements from the Council on Chiropractic Education Australasia competency based professional standards.

Table 2: Alignment of selected accreditation requirements with graduate capabilities

Examples of accreditation requirements for Chiropractic	Aligned graduate capabilities
6. Patient assessment 6.1 Obtains and records patient history	1. Discipline specific skills and knowledge 2. Critical, analytical and integrative thinking 3. Problem solving and research capacity 5. Effective communication 6. Engaged and ethical local and global citizens [note: if teaching involves cultural literacy] 8. Capable of professional and personal judgment and initiative
7. Diagnostic decision-making 7.2 Collaborates or refers as necessary to obtain expert opinion	1. Discipline specific skills and knowledge 2. Critical, analytical and integrative thinking 3. Problem solving and research capacity 5. Effective communication 7. Socially and environmentally active and responsible (note: involves team skills) 8. Capable of professional and personal judgment and initiative
10. Disease prevention/health management 10.1 Develops a personal ability to seek out and apply scientific information	1. Discipline specific skills and knowledge 2. Critical, analytical and integrative thinking 3. Problem solving and research capacity 5. Effective communication 8. Capable of professional and personal judgment and initiative 9. Commitment to continuous learning

It is immediately apparent that each CCEA statement aligns, or potentially aligns, with several graduate capabilities. Each of the selected statements, for instance, aligns with capabilities 1, 2, 3, 5 and 8 (Table 2), but explores different aspects. For example, in addressing the capability "*effective communication*" requirements such as "*obtains and records patient history*" entails being able to ask clear, probing questions and to communicate with the patient in non-technical language, but to also record this comprehensively in specialized language, whereas "*collaboration and referral*" requires professional literacy, involving clear oral and written communication with experts in different professions.

Depending on the emphasis taken in the program, even apparently straight forward requirements such as "*obtains and records patient history*" could encompass additional capabilities such as "*engaged and ethical local and global citizens*", if cultural literacy is explicitly tackled. This is one example where consideration of graduate capabilities has the potential to enhance and broaden conceptualization of an accreditation requirement and how it will be taught within a program.

The Health Studies program
Other programs, whilst not under the direct influence of accreditation, nonetheless need to respond to employer requirements and to prepare students for their complex professional communities. Health Studies initiated a project to incorporate the employer perspective into their deliberations on embedding graduate capabilities into their program. They undertook a survey of potential and actual employers of Macquarie graduates to ascertain their expectations both in discipline-specific and transferable skills and competencies (Bollerup & Clarke, 2008, unpublished report). This information was then aligned with the Macquarie

defined graduate capabilities (Table 3), and will form the basis on which to not only recognize what is already being done, but also gaps in the curriculum.

The data shows that the competencies listed by employers of Health Studies graduates encompass and can clearly be aligned to all of the graduate capabilities (see for example Table 3). This information provides an evidence-based rationale for both the need for and direction of curriculum change in Health Studies.

Table 3: Alignment of graduate capabilities with results of employer surveys in Health Studies

Graduate Capability	Themes from survey results
3. Research and problem solving	- Data acquisition, analysis, interpretation. - Know and understand about data quality, limitations and use. - Use data to make/support a case. - Use principles to evaluate programs, policies. - Understand the connectedness of needs and services. - Have the ability to plan effectively. - Be able to take a program from planning to implementation. - Be able to effect policy change.
5. Effective Communication	- Demonstrate competent and accurate record keeping. - Know the importance of and be able to use different styles of communication for different audiences. - Understand the requirements for different kinds of publications e.g. reports, media, brochures for the general public etc. - Be able to impart knowledge and skills to others; communicate principles to others and communicate with stakeholders. - Exhibit sophisticated advocacy skills.
8. Capable of Professional and Personal Judgment and Initiative	- Demonstrate organisational skills and abilities, and be able to prioritise and manage. - Be able to undertake independent work and show follow-through. - Know where and when to get help. - Be aware of organisational restrictions and responsibilities. - Understand organisational constraints including funds, and be able to cope with limited resources. - Be able to deal with matters outside area of expertise. - Demonstrate professional standards of commenting/and behaviour. - Be able to adapt to change. - Deal with clients from different backgrounds.

The Accounting program

The Accounting program brought together teaching staff in a workshop to recognise where graduate capabilities already featured in their unit guides and teaching practices (e.g. learning outcomes, learning and teaching activities and assessment tasks). The first step was to develop agreed statements of "indicators of development" that would allow teaching staff to recognise graduate capabilities in a consistent way, and to promote a shared understanding of

the capabilities in this discipline. Table 4 shows some examples, based on examination of two units. The statements will need to be broadened as more units are scrutinized.

Some of the staff in this workshop initially exhibited considerable cynicism and resistance, as Harvey & Kamvounias (2008) described, but many were surprised at how many of the graduate capabilities could be recognised in their existing program. In some instances, making explicit what is already implicit would be sufficient. There remain, however, some aspects of many graduate capabilities that are not currently addressed. The challenge will be to effectively embed all capabilities in teaching practices and assessment tasks so that students and as well as staff will recognise them.

Table 4: Identification of graduate capabilities already present in the Accounting program

Graduate capabilities	Selected examples of statements of indicators of development for Accounting
2. A student who has *critical, analytical and integrative thinking*	1. Identifies and analyses quantitative and qualitative accounting data. 2. Competently locates, syntheses, and applies relevant management accounting information and data for decision making. 3. Discriminates between and critically appraise the various techniques and costing systems available. 4. Critiques assumptions, constraints and limitations of concepts. 5. Reviews, critically analyses and expresses judgment about a range of management accounting literature in oral and/or written form. 6. Applies accounting principles, concepts and techniques to understanding the world around you.
5. A student who has *effective communication*	1. Effectively communicates orally, in writing, using numerical or visual communication. 2. Demonstrates effective communication in a group situation. 3. Tailors communication techniques for an appropriate audience, including, *inter alia*, peers and clients. 4. Expresses ideas with clarity and vigour. 5. Presents, appropriately defends and modifies ideas and arguments.
6. A student who is an *engaged and ethical local and global citizen*	1. Demonstrates awareness of ethical issues affecting management accounting and the role of a management accountant. 2. Demonstrates honesty and integrity in academic conduct and the community. 3. Displays personal integrity and awareness of ethical principles, including confidentiality. 4. Co-operates and assists other students in their learning. 5. Demonstrates respect and is open-minded to the ideas of peers from different cultural backgrounds.

Discussion

Graduate capabilities have the capacity to transform education. For Walker, they signify "what we are free to be and do" (Walker, 2006, p. 27). Bowden suggests that they prepare graduates "as agents of social good in an unknown future" (Bowden et al., 2002, online). With a holistic conception, Barrie (2007) argues that they enable new knowledge to be created

and individuals to be transformed. There is a great risk, however, that such lofty sentiments mean that graduate capabilities remain merely rhetorical, and that their idealised and universal nature means a limited impact on learning and teaching, minimal effect on curriculum change and little or no bearing on the student experience.

After more than a decade in which Australian universities have been grappling with the concepts of graduate attributes, qualities or capabilities, Barrie contends that

> *"the extent to which the rhetoric of [graduate capabilities] statements actually represents a shared understanding of the outcomes of a university education is a matter of conjecture. The extent to which present day university teaching and learning processes actually develop such outcomes in graduates is even more contestable."* (Barrie, 2006, p. 216)

The case studies outlined above demonstrate different approaches and starting points taken by different academic programs. The decision to encourage diversity in the way faculties, programs and disciplines interpret and embed graduate capabilities is deliberate, and recognises the importance of discipline specific 'ownership' of the process. As the graduate capabilities were developed at the university level, involvement of teaching staff in deciding how to interpret and embed them is vital to ensure full integration into the curriculum. Jones argues that graduate attributes are undervalued because teaching staff see them as "external to discipline knowledge and teaching practice" and they are "additions to the 'real' curriculum rather than an integral part of the discipline into which students are being inducted" (Jones, 2009, p. 96). These views mitigate against successful integration into the curriculum in more than a superficial way, and underscore the need for teaching staff to understand and endorse them.

Recognition and translation of the graduate capability statements is also important at the program level as this is where the students will encounter and develop the capabilities. As shown in the preliminary study at Macquarie prior to the formal introduction of graduate capabilities, many programs already actively teach some of the capabilities and have an implicit appreciation of others built into the curriculum, some notable gaps notwithstanding.

There are, however, significant differences in the way capabilities are defined and taught across disciplines. As Jones (2009) points out, even something as seemingly straight forward as "problem solving" is viewed and valued differently in different disciplines and this will have profound impacts on how it is taught. Capabilities and skills are largely "discipline dependent as shaped by the social practice of the disciplines" (Jones, 2009, p.98). They are also influenced by external factors such as accreditation bodies and employers. For programs that are vocationally oriented such as Chiropractic and Health Studies, it makes sense to incorporate these factors into and at the very start of the embedding process. For more generic or non-vocationally oriented programs, a different starting point is preferable. The 'one-size-fits-all' approach misses these important opportunities that allow staff to truly come to terms with how the graduate capabilities can fit into and be taught in their program. It also limits the potential to make any real impact on the student experience.

This one-size-fits-all tactic is problematic on a number of fronts, and some of the issues affecting full integration of graduate capabilities are aligned to processes of change management. Harvey and Kamvounias suggest that such an approach "may fail to convince the sceptics while potentially alienating those genuinely concerned about quality teaching."

(Harvey & Kamvounias, 2008, p. 40) Dissemination of ownership of the ideas and embracing a multi-pronged approach to embedding, tailored to the needs of the program, student learning and teacher requirements may go some way to alleviating some of the common problems involved in managing this change. It may also assist with the documented resistance of some staff to embrace change due to perception that it was done by only a select group of staff (Harvey & Kamvounias, 2008).

Harvey & Kamvounias advocate a "teachers as lifelong learners" view in addressing the "implementation gap" between rhetoric and practice (ibid, p. 32). They argue that most teachers have little training in pedagogy and will engage with graduate capabilities to different degrees, as will students. Many may understand graduate capabilities, but not take the next step of changing curriculum and teaching practice. According to Harvey and Kamvounias, change managers need to understand that "change is primarily a learning process" (Harvey & Kamvounias, 2008, p. 33), which means that we must allow adequate time for the process to evolve through trial and review of several iterations.

In 2007, Macquarie started the process of curriculum renewal. Amongst other things, this included the development of graduate capability statements, a review of programs, the introduction of induction and capstone units and a concept of "participation" that takes into account service and work-integrated learning. The juxtaposition of these changes is ideal for embedding graduate capabilities, as it provides an opportunity not only to review is already in place, but also to build new kinds of units of study, different to those that have gone before. Bowden et al. (2002) suggest that development of graduate capabilities is a spiral, rather than linear process, and should be viewed as progressive development across the whole program. The induction, capstone and participation units will go a long way to encouraging this concept. The co-development of these units will also help to progress a more holistic approach of embedding graduate capabilities in the curriculum, and they are thus more likely to impact on the student experience.

At Macquarie, this is likely to be an evolving process with several stages. The first stage, which is underway, involves translating graduate capabilities to discipline-specific language and context, and identifying what is already done in programs to address graduate capabilities. The next steps include mapping the curriculum to identify gaps, and changing the wording of learning outcomes to cover these gaps. This means new rhetoric, but does not necessarily represent changing practice or curriculum. It is our belief that this stage of embedding graduate capabilities will produce little or no real change in student experience. The subsequent step is a band-aid approach to introduce minor or small-scale changes in curriculum or new practices to cover any gaps. This may be largely compliance based, but is likely to produce only minor changes in student experience. After some time staff will realise that they are not really addressing the graduate capabilities as well as they might, and will redesign curriculum and overhaul teaching practices. This should produce a major change in the student experience. The final stage will be incorporation of graduate capabilities into the language used by students about their studies. Then, and only then, can we truly say that we have achieved any change.

Conclusions

If we perceive the embedding of graduate capabilities as a learning process for staff and students, then the holy grail of a holistic curriculum change that addresses graduate capabilities fully will take time. Macquarie has embarked on the change process by involving

as many staff and students as possible and allowing faculties and programs to decide the best way to establish and nurture graduate capabilities in their curriculum and teaching practices. The long-term effectiveness of this approach for improving student learning remains to be seen. The ultimate success will be measured by the extent to which the student experience is transformed.

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