Graduate Attributes: Development and Testing

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ABSTRACT

Background: Universities across the world have considered which attributes were important to their graduates and examined the extent that programs included experiences and opportunities conducive to exposure to and development of the desired attributes. **Methodology:** An action research cycle of three phases focused on review, development and implementation of statements of curriculum intent and outcomes. **Results:** The iterative processes of evaluation and curriculum renewal led to agreement that graduates from university degrees should exit with attributes that distinguish their higher education experience. **Conclusion:** Consultative processes led to identification of Graduate Attributes (GAs) Domains unique to the University. Implementation of the GAs with a selection of programs demonstrated practicality and effectiveness.

Keywords: Graduate Attributes, Action Research, Curriculum Mapping

Introduction

There are a number of reasons for the adoption and development of graduate attributes (GAs) and greater scrutiny of the links among learning outcomes, learning and teaching events and assessment tasks. First, universities have been more considerate of what happens beyond graduation for the members of various disciplines. Hence there needs to be more careful consideration of the application of learning rather than a focus on content alone. Second there is a greater emphasis on developing positive values and ethical behaviours that equip graduates to positively contribute to society. The third issue for consideration centers on the belief that the context of future practice for graduates is unknown. Therefore acquisition of additional knowledge and knowhow is critical to the graduate's ability to manage novel situations. Finally, the employer's needs demonstrate disciplinary knowledge alone will not be enough to guarantee success for the graduate in the real world

of practice. Given these arguments about graduate outcomes, governments have focused on the outputs of university education and the readiness of graduates to participate in the workplace.

In response to these developments, universities in Australia turned their attention first to consideration of what particular attributes were important to them and then to examining the extent to which the various programs on offer included experiences and opportunities conducive to exposure to and development of the desired attributes. The process involving development and adoption of graduate attributes thus becomes a means of curriculum renewal which causes teachers and learners to think about learning and teaching, the way we teach and the manner in which students learn in the contemporary environment.

At the outset, those involved in the project described here, were aware that different disciplines already had well accepted

sets of core skills. A project was commissioned within the Australian university to review the existing set of Core Skills and replace them with a set of Graduate Attributes that are relevant to all Faculties and undergraduate programs.

In Phase One; consultation comprised twenty semi structured interviews and conduct of a focus group with key stakeholders to review effectiveness and relevance of the Core Skills, identify issues, explore alternative models of graduate attributes and propose recommendations regarding the way forward. A document analysis, review of significant reports and selected literature was also undertaken to inform the process. The outcome was a proposed model comprising broad graduate attribute domains. Phase Two involved further consultation and comprised a series of faculty based focus groups to discuss, review and refine the proposed graduate attribute domains into an agreed draft statement to be tested in the final phase of the project.

In Phase Three of the project, nominated programs from each Faculty engaged in a preliminary study of the implementation of the Graduate Attributes Domains. This involved:

1. Alignment of the Program Graduate Profile with the Graduate Attribute Domains.
2. Identifying and describing potential evidence of achievement of the Graduate Attributes and identifying strategies to collect sufficient evidence through assessment.
3. Reviewing the alignment of the teaching and learning strategies across the program to prepare students in the provision of evidence.
4. Documentation – suggestions for documentation at University level for Quality Assurance purposes, student profiles, and public promotion.
5. Identifying resources required to support staff in implementing the graduate attributes.

Outcomes of the preliminary phases

As was anticipated that through the preliminary studies involving workshops with academics, all stakeholders would had undertaken:

- A realistic and thorough critique of the Graduate Attribute Domain Statements and their relevance to, and impact on their program.
- A critical review of their graduate profile.
- Adopted a cross–program focus on assessment resulting in a comprehensive plan for gathering evidence of performance of the graduates.
- Appraisal of a document linking of assessment to the graduate profile.
- Identification of opportunities to enhance the quality of evidence collected through assessment.

The information and feedback from the preliminary round was used to:

- Refine the draft statement of the Graduate Attribute Domains.
- Provide input into the development of a Program Tracking System (PTS) and associated documentation for accreditation purposes.
- Provide input into the development of the university wide E portfolio for students' project.
- Develop, in conjunction with the University's Education Services, a support site describing the process undertaken by the pilot programs to support Faculties and Programs in their implementation of the Graduate Attributes.

Underpinning the project in Phase Three was a set of agreed principles that the graduate attributes should be:

▷ Consistent with and relevant to expectations of the community, employers and professional bodies, and the University.
▷ Reflective of the unique qualities of an education at the University of Newcastle.
▷ Able to be clearly evidenced as graduate outcomes.
▷ Practicable in their implementation.
▷ Sufficiently broad to accommodate discipline and profession specific differences.
▷ Developed through a consultation process with Faculties and Schools.

The conceptualization, definition and selection of graduate attributes

Both discipline knowledge and skills development, other more generic abilities, intellectual and social, are equally crucial in a symbiotic relationship within curricula (Bath et al., 2004 p. 326). A balance is needed between the body of professional knowledge and other skills such as communication, teamwork, leadership and analytical and critical thinking. Critical thinking about actions specific to the professions profession cannot be developed independently of the subject matter and values nderpinning the discipline. The exercises described above informed the processes of curriculum renewal, taking into consideration the relevance development of abilities pertinent to each activity within classrooms (actual or virtual), laboratories, experiences and contexts. When

...the student develops the generic skill of problem-solving in a discipline nuanced way, the student probably needs not only to attend to the discipline subject matter at hand, but also the variety of different discipline approaches and contexts in which problem-solving needs to occur, discipline-specific historical and philosophical perspectives on how such problems had previously been solved....thereby also increasing their discipline knowledge and skills (Bath et al., 2004).

The conceptualization of generic graduate attributes for the present study was consistent with definition in the Higher Education Council (HEC) report Achieving Quality that stated:

These are the skills, personal attributes and values which should be acquired by all graduates regardless of their discipline or field of study. In other words, they should represent the central achievements of higher education as a process (HEC, 1992, p.20).

However, during the consultation period it was asserted by some academics that the graduate attributes are so discipline or profession specific that any attempt to define common or generic attributes resulted in the statements being so broad as to be meaningless. Others agreed that graduate attributes can include generic skills and that the development of these is not the responsibility of the disciplines. This supports Barrie's (2004) findings that academics do not hold a shared understanding of generic graduate attributes and indeed hold different conceptions of these as outcomes and of the teaching and learning approaches associated with development of the attributes as outcomes. He argued that their conceptions can be categorized as four increasingly complex understandings of graduate attributes as outcomes. These describe graduate attributes as:

▷ Undifferentiated foundation skills.
▷ University level skills but distinct from discipline outcomes.
▷ University level skills distinct but not independent of discipline knowledge.
▷ Abilities which are integral and central to the discipline knowledge and learning.

Examples of each of these perceptions were evident in the views expressed during the consultation phases. Importantly these conceptions have implications for academics' beliefs about the teaching and learning strategies required to develop the attributes. Barrie (2004) argued that policy statements relating to the identification of graduate attributes and their implementation should take account of these different conceptions to promote effective implementation of the policy.

While there was not unanimity about the nature of the graduate attributes, most academics mentioned communication skills, in particular written communication; problem solving, critical thinking and research skills as the attributes that define a higher education experience. Some argued strongly that it was the research skills that clearly distinguished University graduates from other tertiary education graduates. Others suggested that the inclusion of

research skills was problematic unless very broadly defined. They argued that students in their programs demanded a very practical and vocationally oriented program and were critical of activities requiring reviews and critique of literature. They contended that if the University was serious about its commitment to ensuring the acquisition of the graduate attributes, then it would need to support Programs in making these expectations clear to students and support staff in embedding them in their curricula.

One of the criteria suggested for the set of graduate attributes that might be developed to replace the Core Skills was that they should reflect the particular values espoused by the University and its community of scholars. It was argued that if the University wished to distinguish itself from other Universities, then it should define its particular interpretation of the generic higher education attributes, rather than develop additional statements in an attempt to create difference. As one Program Convener explained, it is about creating a niche within the accepted concept, not a difference by being outside the concept.

Most Program Conveners, the leaders of curriculum implementation, while being supportive of the concept of graduate attributes were also concerned that any policy related to their implementation became a "toothless tiger" as they believed it is difficult to measure the outcomes or even audit the processes. They were further concerned that pressure to meet quality assurance requirements had the potential to generate increased paper work and documentation (such as elaborate curriculum mapping exercises) with little evidence of real outcomes. They also agreed that any new or revised policy should accommodate the different conceptions of academics as noted in Barrie's research (2004).

There was a very strong view among Program Conveners that the responsibility for ensuring achievement of the graduate attributes goes beyond the academic programs. It was commonly asserted that it is the total student experience that contributes to the development of the graduate attributes. It is therefore the responsibility of the whole institution and all staff to provide a learning environment and experiences conducive to their development of the desired attributes and achievement of the outcomes.

Barrie's (2004) model based on his research, proposed a twotiered model. The top level provides three broad attribute domains that are University wide and a second level that are the same domains expressed in a different way that he claims has more relevance at the faculty level. Barrie's top−level statement is derived from the University's Mission statement. It was agreed by workshop participants that this model was worth exploring to address the tension between University wide attributes reflecting a profile to differentiate Newcastle University graduates and the more generic attributes relevant to the Faculties.

Further discussion regarding the second level statement of graduate attributes highlighted concerns that having two layers may be adding a level un−necessarily. Graduate profiles already have to be mapped to professional competencies (in professional programs) and it would be easier to map the program graduate profile to just the top−level broad statements. In support of a second level statement, Barrie argued that the majority of academics did not recognize the top level statements as relevant to their courses and therefore did not relate to them or embed them in their courses. He reinforced the need to restate them in a way that was meaningful to them. The tension therefore was between broad descriptors that attempt to define the uniqueness of the graduate from a particular university, and more specific descriptors that are readily applicable to the Program's graduate profile. It was agreed by the group that a few brief, succinct statements were preferable. A review of the relevant Mission statement and subsequent discussion resulted in the following suggestions for the broad domains of graduate attributes: Professionalism; Citizenship (or Citizenship and Social responsibility); Scholarship and Research as the agreed graduate attributes domains.

▷ **Professionalism: An attitude or stance towards work and activity** – Graduates of the university, through well-founded knowledge and skills within their fields of study will be enabled to act professionally with honesty and integrity. They will be able to act effectively and ethically in decision-making and problem-solving and work both autonomously and collaboratively. They will have the ability to respond creatively to change and to seek continuous improvement in practice.

▷ **Community responsiveness: An attitude or stance towards society** – Graduates will be enabled to play effective and responsible roles as members of local, national and global communities. They will have a capacity for perspective taking and an appreciation of the philosophical and social contexts of their disciplines. They will have the leadership capacity to engage in constructive public discourse.

▷ **Scholarship: An attitude or stance towards knowledge and learning** – Graduates of the university will have a scholarly attitude towards knowledge and learning, having a commitment to the expansion of knowledge and a respect for intellectual integrity and the ethics of scholarship. As scholars they will be enabled to apply logical, critical and creative thinking to the advancement of knowledge and understanding through a capacity for rational enquiry and self-directed learning. They will be enabled to communicate their knowledge effectively.

Findings and recommendations

The processes applied to curriculum renewal are described in Figure 1.

The data collected through the workshops and meetings was collated and reported under the relevant project objective. Recommendations emerging from the data are made at the end of the section for each objective.
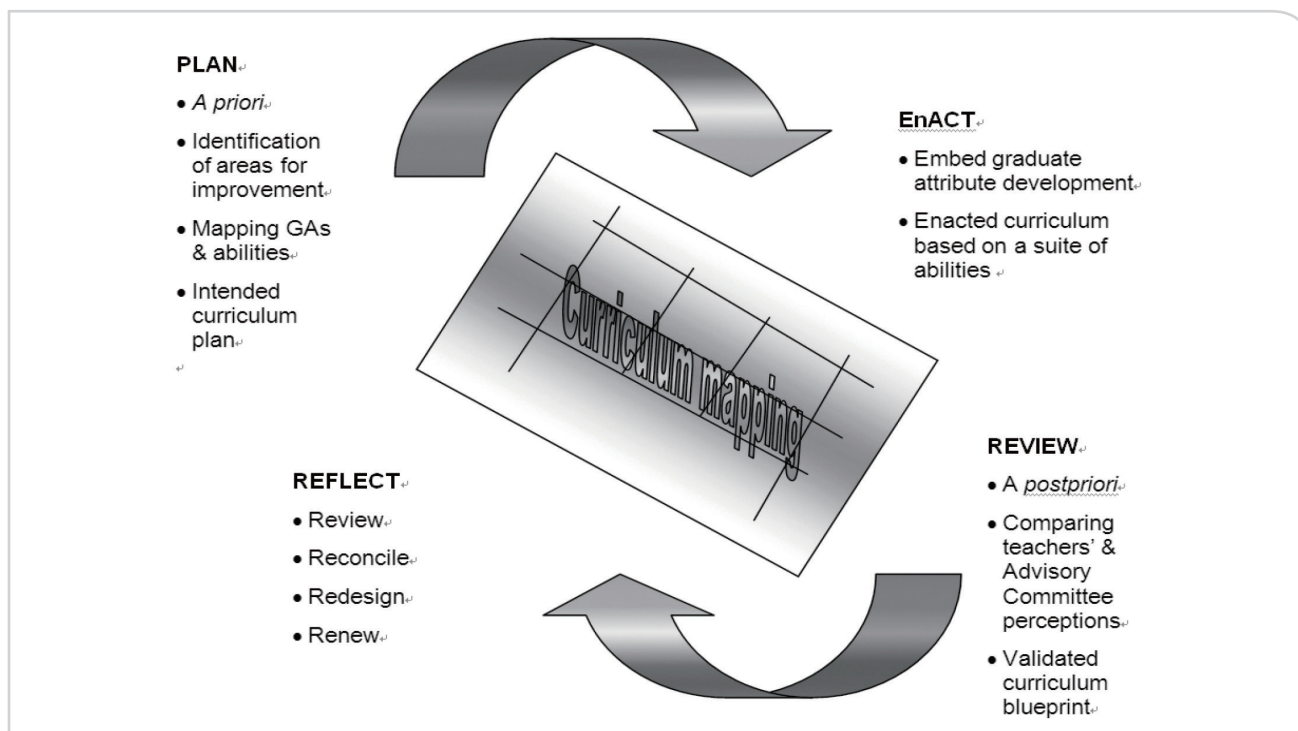

Figure 1. Action learning cycle: planning, enacting, reviewing and reflecting on the mapped curriculum based on identified abilities to inform design and implementation strategies.

OBJECTIVE 1:

Refine the draft statement of the Graduate Attribute Domains and test out the alignment of a selection of graduate profiles against the Domains.

Review of the Graduate Attribute Domains

The draft statement of the Graduate Attribute Domains was discussed and reviewed by all involved. All program representatives found the conceptualization of broad domains at the University wide level to be a practical and workable approach. In the main the three areas addressed by the Graduate Attribute Domains were found to be acceptable and relevant. All programs perceived immediate relevance of the Professionalism and Scholarship Domains. Some programs had some initial concerns about the relevance of the Community Responsiveness Domain and after discussion all programs acknowledged the importance of this Domain.

The domain descriptors were perceived by some programs to be very general and expressed concern that they were not sufficiently specific to have meaning and provide guidance. It was noted that in order for all undergraduate programs to be able to comply with delivering the attributes as outcomes of their programs, there was a need for the domains to be broadly expressed. This was determined during considerable consultation in the early phases of the project. Notwithstanding, in some programs there was concern about the wording of the descriptors for each of the Domains. The most common concern related to the inclusion of leadership capacity in the Community Responsiveness Domain. Some program representatives expressed a preference for the descriptors to be documented differently but most found the wording to be acceptable.

Alignment of the Graduate Profile with Graduate Attribute Domains

Some time was spent in the workshops generating a Graduate Profile for the programs that did not have one already. The approach used for this exercise was to generate the statement of graduate outcomes from the perspective of the discipline/s involved first and then to review the graduate profile for its alignment with the Graduate Attribute Domains. It was important to adopt this approach to test out the relevance of the Graduate Attribute Domains. All program representatives reviewed their Graduate Profile for currency, relevance and consistency.

The challenge of specifying outcomes of the program (in addition to the acquisition of knowledge) created much debate. Programs that were subject to external accreditation by professional bodies had been caused to consider these outcomes and had well developed relevant graduate profiles. Other programs found the exercise provided the opportunity to consider how they might specify the attributes of graduates of their programs that would not only meet the University's expectation but also the expectations of other stakeholders such as prospective students, employers and the community. Some programs recognized the opportunity to differentiate their graduates from graduates of similar programs in other Universities.

The programs involved in the preliminary stages used three different approaches in testing out the alignment of the Graduate Profile with the Graduate Attribute Domains as follows:

1. Each statement in the Graduate Profile was reviewed and the Domain/s to which it related, was noted. Most programs that did this noted the specific indicator in the Domain to which the statement linked.

2. Each Domain was reviewed and the statements from the profile that were aligned to the Domain were noted. Again, most programs using this approach broke the Domains down into the specific indicators in the current description.

3. Some programs found both ways to be inadequate as they had additional attributes such as cultural sensitivity that is not specified in the Domains and preferred to be able to justify in free text.

Most programs using the first approach found that many of their profile statements related to more than one Domain. They also believed that it was not sufficiently informative to align the profile statements with just the title of the Domain (Professionalism, Community Responsiveness, Scholarship). It was necessary to identify the specific indicator from the Domain that related to the profile statement. Those programs that used the second approach took the domains and categorized their Graduate Profile statement under each Domain. In some programs this resulted in duplication of the profile statements as they related to more than one Domain. Some suggested that the preferred documentation for demonstrating alignment would be to write a brief justification.

RECOMMENDATIONS

1. The draft statement of the University of Newcastle Graduate Attribute Domains be accepted.

2. Every undergraduate program is to provide a Graduate Profile. This generally states what the graduate has been enabled to do as a consequence of undertaking the specific program of study. The Graduate Profile is then mapped to the Graduate Attribute Domains. The Graduate Profile is modified as necessary to ensure alignment with the University's expectations of graduates. The program will justify the alignment of its Graduate Profile with the University's Graduate Attribute Domains.

OBJECTIVE 2:

Provide input into the development of a Program Tracking System (PTS) and associated documentation of the Graduate profiles and evidence of achievement.

Early phases of the project identified the need for an enterprise wide system such as a Program Tracking System (PTS) to ensure consistency, transparency and quality. An efficient and simplified system is desirable. The PTS could record: The Graduate Profile; a statement describing the relationship of the Graduate Profile to the Graduate Attribute Domains; a brief description of the types of assessment and tasks designed to provide evidence of achievement of the Graduate Profile; and the key teaching and learning strategies that address the Graduate Profile. These items were deemed to comprise the essential elements for quality assuring the role of undergraduate programs in the implementation of the Graduate Attributes.

In addition it was proposed that such a system would be a valuable aid to curriculum design in the development and review of programs in providing an appropriate focus on the Graduate Profile as a statement of outcomes achieved by the graduate and the requirement for outcomes−based assessment as the evidence of attainment. This proposal was discussed at each of the workshops. The issues raised are discussed under the emergent themes.

Quality assurance system

- The introduction of a PTS was seen as a potentially useful tool for quality assurance as currently program conveners have difficulty in maintaining complete and current information about the program.

- There was general agreement that the previous requirement in program documentation of developing a series of matrices of the core skills and program objectives was not effective in promoting the implementation of the core skills and provided little meaning or value. It was agreed that any system to assure the achievement of the graduate attributes would need to document outcomes as well as process.

- It was also noted that the PTS would be only one strategy providing Quality Assurance in relation to Graduate Attributes. While the PTS will record the opportunities provided to students to provide evidence of achievement of the attributes, that is the assessment tasks, it does not provide actual examples of the student responses. Such examples

should be captured on the proposed Graduate Attribute website. The Student ePortfolio would also provide a broad range of evidence, including evidence collected outside of the formal assessment system. Other strategies that evaluate teaching and learning outcomes would also be necessary.

A Focus on outcomes rather than process

- In relation to providing evidence of achievement through assessment, the majority of programs perceived value in linking assessment to the Graduate Profile statements. It was generally agreed that students would benefit from receiving the Graduate Profile as the explicit definition of program outcomes and in perceiving assessment as evidence of their development towards and achievement of those outcomes.

- A focus on outcomes as a measure of Quality Assurance was seen by some to be problematic in that, if evidence is difficult to collect, it may result in a redefinition of the outcome and therefore potentially compromise desirable goals that are more difficult to measure. The challenge is somewhat addressed if assessment is perceived as evidence rather than a measure of the outcome specified in the Graduate Profile.

- There was some concern that while assessment can provide evidence of outcomes at the course level, it could be problematic for a course assessment to provide evidence of outcomes for Graduate Profiles of multiple programs. Some courses service large numbers of programs (eg. 15). However, it would be necessary for the course to provide this evidence for programs for which it is a prescribed or directed course only.

A template for linking intentions to outcomes i.e. graduate profile statements to assessment tasks

- Most programs agreed that it would be possible to identify assessment tasks that provide evidence of achievement relevant to each profile statement. Some programs identified potential gaps in the

evidence and acknowledged that they would need to review their assessment.

- Discussion of a possible template for providing evidence of achievement by linking assessment tasks to Graduate Profile statements identified a number of issues. These included:

  ▷ Depending on the range of flexibility or rigidity of the program structures (prescribed and closely regulated by professional accreditation bodies to those with more flexibility such as liberal arts degrees) could provide examples of assessment from the prescribed and directed courses. It was not perceived as useful to document all assessment in these courses but to select examples of assessment tasks relevant to each Graduate Profile statement.

  ▷ Many of the majors for example in the Arts degrees are presented as a collection of courses rather than as a suite or sequence of courses designed to develop certain outcomes or understandings. Majors need statements of outcomes for students that could be expected from undertaking the major. Students can select form a wide range of courses in each major. The outcomes may vary from cohort to cohort. To ensure a developmental approach to achieving the Graduate Attributes, the structures for all programs need to be more prescribed in terms of courses required at each level for completion of any templates in the PTS.

  ▷ There were major concerns about the logistics of linking the assessment across the program to the Graduate Profile due to issues of program management and access to detailed information about assessment tasks in individual courses from many different Schools. Some examples of templates identifying the Graduate Profile, its alignment with the University's Graduate Attribute Domains, the evidence of achievement (assessment tasks) and specifying the prescribed or directed courses that provide the assessment tasks are provided.

RECOMMENDATIONS

3. The Program Tracking System (PTS) be used to document the program's Graduate Profile and justification of its alignment with the University's Graduate Attribute Domains.

4. The evidence of performance that is to be used to validate achievement of the Graduate Profile is documented by identifying specific examples of assessment tasks that are deemed to provide relevant evidence of each graduate profile statement. The courses providing the relevant assessment tasks will also be identified in the documentation.

5. The courses from which the assessment examples are drawn would, in most programs, include prescribed and directed course options.

6. The definition of a major, needs to be reviewed to include the requirement for a sequence of prescribed courses comprising a minimum of one course at each level of 1000, 2000 and 3000. This would ensure all undergraduate programs provide a minimum set of prescribed appropriate learning opportunities for students to develop the graduate attributes.

7. In the first stage of the development of the PTS, there will be brief descriptions of the type of assessment and the specific course in which it is located. However, as the course outline and associated documents record more detailed descriptions of the assessment tasks and criteria for performance, it is desirable that these are eventually linked to the PTS.

OBJECTIVE 3:

Provide input into the project to develop the ePortfolio for students

In reviewing an ePortfolio project charter it was noted that the primary function was identified as "the development, tracking and assessment of professional competencies of students throughout their studies", and allow for these to be output as a "ready-to-use" printout. It is proposed that professional competency

statements be developed in association with relevant industry bodies. It is desirable that the ePortfolio also be used for the development, tracking and assessment of the Graduate Attributes as specified in the Graduate Profile. The potential for this function was implicit in the acknowledgement that "different faculties have different needs regarding the tracking of professional competency statements and the like; [and] the system must be able to accommodate this diversity. It must allow for students to reflect and build upon competencies and skills from a more general perspective, as well having sections explicitly targeted to specific course needs." However, all undergraduate programs need to recognize the potential use for the development of the Graduate Attributes and that this use be made explicit.

RECOMMENDATION

8. The student ePortfolio project charter be include specific reference to the potential use of the ePortfolio for the development, tracking and assessment of graduate attributes.

OBJECTIVE 4:

Develop a proposal for a web-site site to support Faculties and their programs in the implementation of the Graduate Attributes.

It was evident from the workshops that academics staff valued support and guidance in developing and reviewing the Graduate Profile for their program. The formulation of the Graduate Profile as a set of effective, comprehensive and relevant outcomes for graduates was a critical success factor in achieving the attributes described in the Graduate Attribute Domains. Support could be provided through workshops, a website, and other peer learning development strategies. In particular, many staff expressed interest in sharing experiences about and getting assistance in, the development of appropriate assessment tasks to provide evidence of achievement of the attributes as described in the Graduate Profile. The proposal for a Graduate Attributes website that would provide developmental

opportunities as well as information and exemplars was welcomed by workshop participants. It was noted that academic input at the design stage was essential to ensure relevance and usefulness. It was suggested that a two-way flow would be desirable so that one could proceed from Graduate Profile statement to evidence of achievement and also from case study of assessment to Graduate Profile statement.

RECOMMENDATIONS

9. Curriculum development support be provided to program conveners and other staff involved in program review and development.

10. A professional development website on graduate attributes be developed with input from academic staff.

Evaluation

The sample of programs used in this phase of the project to trial the implementation of the graduate attribute domains was selected from across all faculties and illustrated each of the curriculum models. However, the sample size was small and a comprehensive evaluation of the implementation of the Graduate Attribute Domains will need to be conducted over three years to ascertain the:

▷ relevance of the Graduate Attribute Domains to all undergraduate programs.

▷ quality of evidence of achievement of the graduate Attribute Domains.

▷ usefulness of documentation and the Program Tracking System for quality assurance.

▷ impact on approaches to assessment in undergraduate programs; and

▷ impact on students' understanding and awareness of graduate outcomes.

RECOMMENDATION

11. An evaluation of the implementation of the Graduate Attribute Domains be conducted over three years and appropriate modifications made based on the evaluation outcomes.

Conclusion

The aim of this project was to develop a set of Graduate Attributes that were:

▷ consistent with and relevant to expectations of the community, employers and professional bodies, and the University.

▷ reflective of the unique qualities of an education at the University of Newcastle.

▷ able to be clearly evidenced as graduate outcomes.

▷ practicable in their implementation.

▷ sufficiently broad to accommodate discipline and profession specific differences.

▷ developed through a consultation process with Faculties and Schools.

The set of Graduate Attribute Domains are unique to the University and have been developed through an extensive period of consultation with the Faculties over a period of eighteen months. A trial of the proposed procedures for the implementation of the Graduate Attributes was conducted with a selection of programs and appears to be both practical and effective.

The shift in emphasis from mapping the Graduate Attributes against all aspects of the curriculum to focusing on evidence of achievement was an important activity to undertake but further research and evaluation is required to validate these conclusions.

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