Designing a competency based program to facilitate the progression of experienced engineering technologists to professional engineer status

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Abstract

This paper describes the pedagogical principles that underpin the design the Master of Engineering Practice, a distance education program offered by the University of Southern Queensland. This innovative program enables experienced engineering technologists to use their workplace learning to assemble portfolios that demonstrate their achievement of many of the competencies defined for a graduate of the program. Students are required to be self-directed learners and to use reflective practices to assess their own learning. Following a self-assessment process undertaken in the first course in the program, each student prepares a Pathway to Graduation Plan which they then follow through to graduation. Graduates of the program are able to become registered as Chartered Professional Engineers.

Keywords: RPL; Workplace Learning; Portfolio; Reflective practice; Self-assessment; Learning contract.

1. Introduction

The Faculty of Engineering and Surveying at the University of Southern Queensland (USQ) has developed a Master of Engineering Practice (MEP) program that enables experienced engineering technologists to use their workplace learning to demonstrate their achievement of many of the objectives of the program. Graduates from the program are eligible for membership of Engineers Australia (EA), initially at Graduate Engineer level but on the pathway to full Chartered Professional Engineer status.

The pedagogical design of this program was developed using a number of principles that were drawn from a review of the literature. The discussion of these principles, and the research they were based on, is embedded in the description of the program to assist the reader's understanding of the paper.

2. An Overview of the Master of Engineering Practice

Figure 1 shows the two pathways USQ has developed for engineering technologists who wish to advance to Graduate Professional Engineer status. Whilst all graduates from a Bachelor of Engineering Technology program (or equivalent) may enrol in the Bachelor of Engineering program, only those with at least five years of relevant experience in the engineering industry may apply to undertake the MEP program. This restriction is imposed to ensure that they have sufficient experience to enable them to complete the Portfolio courses in the program.

[Insert figure 1 about here]

The MEP program was developed in 2003 and it was accredited in 2004 by both USQ and Engineers Australia. It is only available in the distance education mode and was offered for the first time in the second half of 2004.

At USQ a program leads to an award such as a degree, and consists of a number of equal sized courses. Full-time students would normally study eight courses a year and part-time students four courses. Students would normally do approximately 165 hours of work to satisfactorily complete a standard course. Some programs, like the MEP, also include one or more Practice courses which are based about a one-week, on-campus residential school and involve about 50 hours of student effort.

The MEP program may be studied over three semesters of full-time study or six semesters of part-time study. It consists of 12 standard courses and one Practice course associated with their discipline. Two different types of standard courses have been included in the program to enable students to achieve the program objectives:

- Technical courses that will enable them to learn, practice and be assessed on new knowledge and skills. These courses are drawn from the existing suite of courses offered by USQ and students will complete four compulsory Technical courses and at least two other Technical courses as electives; and
- Portfolio courses that will enable them to be assessed on the learning, knowledge and skills that they have acquired during their experience in the engineering

workforce. The Portfolio courses were specifically designed for the MEP program and students will complete three compulsory Portfolio courses and at least one other Portfolio course as an elective.

The relationships between these courses are shown in Figure 1.

3. Defining the competencies of a graduate of the program

A Program Development Team (PDT) was formed to develop the structure, content and pedagogy for the program. The first task of the PDT was to develop a complete and detailed set of statements defining the competencies of a graduate of the program. This set of statements is an essential part of the program because in up to half of the courses they study, the students are required to use their workplace learning to demonstrate their competence. Before describing how these competencies were defined, it is important that the meaning of the term competency is understood in this context.

The term *graduate competencies* is not widely used in Australian universities, perhaps because the word competency has become associated with trade and other technician level programs. In this context a task based approach is normally used to demonstrate competence, with discrete tasks being completed in isolation. This approach could be regarded as a behaviourist approach to learning as students must demonstrate certain behaviours (competencies) to complete a course (Boud 1995). Generally, this is very different from the assessment of a competency in a university program, where a student's performance in using a complex mix of knowledge, skills, attitudes, and values is likely to be assessed in a discipline context (Boud 1995). This is particularly true for the MEP program where students will use their learning from workplace experiences to demonstrate their competence. Biggs suggests that the assessment of contextualised performance is different from the behaviourist approach as it is the 'qualitative assessment of applied procedural knowledge' (1996 p27).

When this approach to learning is used the emphasis shifts from how, when or where student learning occurred, to the measurement of that learning (Jarvis *et al.* 2003). This is an important aspect of the MEP program as each student will have acquired their learning through different workplace experiences.

In Australian universities the phrase *graduate attributes* is normally used to describe the broad set of learning outcomes, both generic and discipline specific, achieved by a student who has successfully completed a program. In other contexts alternative words are commonly used in place of *attribute,* words such as *ability, capability, or skill* (Gilbert *et al*. 2004). The term *generic graduate attributes* is normally used to describe the '*… skills, knowledge and abilities of university graduates, beyond disciplinary content knowledge, which are applicable to a range of contexts*' (Barrie 2004 p262). The following terms are also commonly used to describe these generic graduate attributes (Johnston *et al.* 2004; Gilbert *et al*. 2004): *core skills, essential skills, employability skills, general skills, generic skills, generic professional skills, non-technical skills, soft skills, and transferable skills.*

A further complication is that in some fields the term *generic* is also used to describe the graduate attributes that are common to graduates in a particular field, for example, engineering. This approach recognises that the graduates from a specific discipline, such as civil engineering, will have acquired a set of specialist attributes as well as those that are common for all engineers.

In this paper the following terms and definitions are used:

- Graduate attributes and capabilities: the broad set of graduate attributes ;
- Generic graduate attributes and capabilities: the graduate attributes and capabilities that are common to all engineering graduates; and
- Discipline graduate attributes and capabilities: the specific graduate attributes and capabilities for an engineering discipline such as civil engineering.

3.1. *The generic graduate attribute and capabilities*

The generic graduate attribute and capability statements for the MEP program were derived from those previously adopted for the USQ Bachelor of Engineering program, and from the National Generic Competency Standards for Chartered Professional Engineers (Stage 2) which is published by Engineers Australia (EA 2003). These competency standards are used by EA to assess candidates for Stage 2 - Chartered Professional Engineer status.

Graduates from a Bachelor of Engineering program are eligible to become Graduate members of EA as they will have satisfied EA's Stage 1 Competencies (EA 2004b) if the program they completed has been accredited by EA. They would then normally apply to EA to be registered as a Chartered Professional Engineer three or four years after graduation, with their application based on the industrial experience they have had since graduation.

The decision to adopt the Stage 2 Competencies for the MEP, rather than the Stage 1 Competencies, was based on two reasons:

- The PDT recognised that, because of their extensive industrial experience, many of the MEP graduates would, a short time after graduation, be able to apply to be registered as a Chartered Professional Engineer. Therefore, if the same assessment process is used in the MEP it will be far more efficient for the students as they will use some of the documentation for their EA application.
- The graduates from the program will have different attributes and capabilities when compared to graduates from a traditional engineering degree program as their learning will be practice based and contextualised. In this sense the use of the Stage 2 Competencies places a greater value on attitudes (A) and skills (S) than on knowledge (K) when compared to Stage 1 Competencies. In a traditional curriculum the order of priority for these three elements has been KSA, that is knowledge is valued more highly than skills and skills more highly then attitudes. The move towards a curriculum where the order of priority is changed to ASK is part of the change required for a society to become a learning society rather than a knowledge society (OECD 2003). This is appropriate for students in the MEP as they are already embedded in their career and have already acquired many of the required attitudes and skills. The program therefore aims to enable them to acquire

the metacognitive skills required to learn from their workplace experiences and to firstly define, then locate and finally learn the knowledge they require to complete a project.

A copy of the generic graduate attribute and capability statements is reproduced in appendix A.

3.2. *The discipline graduate attributes and capabilities*

A set of discipline attribute and capability statements was developed for each of the study majors available in the program to enable students to specialise in a field of engineering, such as civil engineering. These were developed by the relevant Head of Discipline in consultation with his colleagues. This was the first time that discipline attribute and capability statements had been defined in such detail at USQ.

The discipline statements were written in the same style and format as the generic statements for the program. A sample set of discipline attribute and capability statements is reproduced in appendix B.

3.3. *Course objectives and defining activities*

A set of learning *objectives* was developed for each of the graduate attribute and capability statements. For the generic attribute and capability statements the vast majority of the *objectives* were adapted from the Elements listed in the EA Stage 2 Competency tables (EA 2003). For the discipline attribute and capability statements the objectives were drawn from the existing technical courses.

A set of *defining activities* was then developed for each of the *objectives*. These *defining activities* describe ways in which students may demonstrate that they have achieved the learning *objective*. For the generic *objectives* the *defining activities* listed for an EA Element were, where appropriate, adopted for the equivalent MEP *objective* although for some *objectives* the *defining activities* had to be modified or made optional. An example of this is shown in Table 1. A set of *defining activities* also had to be developed for each of the discipline *objectives*.

[Insert Table 1 about here]

Each of the generic *objectives*, together with its associated *defining activities*, was then allocated to one of the new Portfolio courses to form a set of coherent *objectives* for each course. The table reproduced in Appendix C is the design template for the first course in the program, ENG8300 Self-assessment Portfolio. It shows the course *objectives*, the associated *defining activities* and their relationship to the generic (MEP) *defining activities* and the EA *defining activities*.

4. The student as a self-directed learner

The portfolio is the most common mechanism used to enable students to demonstrate their workplace learning (Jarvis *et al.* 2003), and it is the approach adopted for this program. When undertaking the Portfolio courses in the program students are expected to operate as adult learners. They are expected to self-assess their existing learning, identify any additional learning they need to be able to demonstrate their achievement of the objectives of the course, and then manage their acquisition of that learning. To be able to undertake these tasks they need to have or acquire the skills required to be a self-directed learner.

It is important to recognise the individual nature of this type of learning, as each student will acquire their learning in different ways and from different experiences. Consequently it is expected that there will be little peer support as students are unlikely to see significant benefits in collaborating with other students with regard to learning. It is likely, however, that there will be significant collaboration about process, and also about the preparation of the documentation they are required to submit for assessment purposes.

4.1. *The learning process*

The four stage process suggested by Evans has been adapted for this program:

1 'Systematic reflection on experience for significant learning;
2 Identification of significant learning, expressed in precise statements constituting claims to the possession of knowledge and skills;
3 Synthesis of evidence to support the claims made to knowledge and skills; and
4 Assessment for accreditation.'

(Evans 1987 1992 in Jarvis *et al.* 2003 pp168-169)

In stage 1 of the process students reflect on their workplace experiences to identify learning that they can use to demonstrate they have satisfactorily completed one or more of the defining activities for a course. They may identify defining activities associated with generic attributes and capabilities, or with discipline attributes and capabilities, or a combination of both types.

For stage 2 the student writes a detailed Career Episode Report (CER) that describes the experiences encountered, the learning outcomes, and the defining activities demonstrated. The CER must be endorsed by the student's workplace supervisor. The CER used for this purpose is similar in content and format to that used by applicants for registration by EA as a Chartered Professional Engineer and therefore students will be able to use them when they apply for Chartered Professional Engineer status as they will be addressing the same defining activities. More details about the content and format of a CER can be found in EA (2004a p39).

Stage 3 of the process requires students to gather all of the CER's and other evidence into a portfolio. They then prepare a summary document that identifies the CER where their performance of each of the defining activities has been documented.

For the last stage of the process the student is required to conduct a self-assessment of the portfolio to identify any gaps in their learning and to describe how and when they propose to acquire the learning required to fill those gaps. The portfolio is then submitted for assessment by USQ staff. If the student demonstrates satisfactory performance of the vast majority of the defining activities prescribed for the course then the objectives of the course have been achieved.

During the semester students may submit drafts of the CERs and other documents to USQ staff for review and comment. This is part of the formative assessment process and therefore no marks are allocated. Once the final portfolio has been assessed the student is allocated a final grade for the course. The grade awarded depends on the demonstrated level of achievement of the course objectives.

4.2. *The learning skills*

It can be seen from the previous section that to be successful in this program a student will need to use a number of well developed generic skills. Two of those skill sets are critical - written communication skills and the skills relating to reflective practice.

As the students will have completed an engineering technology degree, or equivalent, to gain entry to the program they should have already acquired the communication skills required for this program. The level of communication skills will, however, be assessed in the first Portfolio course: ENG8300 Self-assessment Portfolio. Students will be directed to undertake an online remedial program if their communications skills are not up to the required standard.

A Reflective Writing Guide was prepared to enable students to acquire or enhance the skills they need to reflect on their educational and work experiences and to help them identify their learning from those experiences. While these skills are important for students in this program they are also part of the life-long learning skill set required for contemporary practitioners. Research has shown that reflective writing helps practitioners clarify their thoughts; work out strategies for solving engineering problems; understand important aspects of their course; and identify areas where they need more help (Selfe *et al.* 1983).

Cantwell *et al*. (2004*)* highlight the problems that students may encounter when they enter a university program with advanced standing based on the recognition of prior workplace learning. Through their industry experience they may have acquired a belief in the structural simplicity of knowledge which may lead to surface learning rather than deep learning. If this belief is retained during their university program then it is likely to impact on their academic performance (Cantwell *et al*. 2004*)*.

Trowler notes that once these students enter the university environment they are asked *'…to convert practical knowledge … into a form of propositional knowledge which is conceptual, explicit, coherent and organised along discipline lines'* (1996 p20). Thus a student's ability to reflect on their workplace experience may be hindered by their understanding of knowledge.

Because of their prior experience of university study it is not expected that the students in this program will be affected by these problems. All commencing students will, however, be encouraged to complete the same three questionnaires used by Cantwell *et al.* (2004) in their study. Due to the planned low number of enrolments in the program it will take two or three years to obtain data from a sufficient number of respondents to test the validity of this claim.

In addition, and along with all of the other commencing undergraduate students in the programs offered by the Faculty, the commencing students in this program will be invited to participate in a wider study aimed at identifying the factors that influence success in the first year of study at the University of Southern Queensland. The findings of stage 1 of this study are reported in Burton *et al.* (2005).

5. The teacher as facilitator

The pedagogical approach used in the MEP program requires the teacher to facilitate student learning, a normal role for teachers with adult students (Jarvis *et al.* 2003). Brockett *et al.* (1991 pp108-109 in Jarvis *et al.* 2003) provide a useful list of the roles a facilitator may undertake in facilitating self-directed learning. For the MEP these translate into the following:

- Students are provided with information on certain topics in a Course Guide and also online via WebCT;
- Students can access electronic copies of the templates for CERs and other documents via WebCT.
- The facilitator acts as a resource for students by establishing, promoting and mediating WebCT discussion boards and by answering email and telephone queries from individual students.
- Staff members assist each student to assess their learning and to develop their Pathway to Graduation Plan. They then provide feedback on successive drafts of the Plan.
- Staff will help students develop an attitude about, and approach to, learning that fosters independence;
- Staff help students develop a positive attitude to learning and self-directed enquiry; and
- Staff evaluate student accomplishments both throughout and at the end of a learning experience.

Because each student in the program has different prior learning experiences, and because they are following individual learning pathways, it is difficult to predict the obstacles they will encounter, and their learning needs. In this situation the facilitator must be flexible and be ready to respond when problems occur. The use of online discussion boards has proved to be extremely useful in this situation.

6. The learning contract - the Pathway to Graduation Plan

The first course in the program, ENG8300 Self-assessment Portfolio, requires students to assess their learning against all of the defining activities listed for the program as well as those listed for their major study. They then develop a Pathway to Graduation Plan that lists both the Portfolio and Technical courses they will complete to demonstrate that they have achieved the required graduate attributes and capabilities.

At the completion of this course students are required to submit a self-assessment portfolio for assessment. The portfolio will normally contain the following documents:

- A detailed curriculum vitae;
- A table showing their self-assessment of their learning against the defining activities;
- Their Pathway to Graduation Plan;
- A template showing the proposed contents of each of the Portfolio courses they propose to undertake;
- An abstract for each of the CERs they plan to write to demonstrate their performance of the defining activities in the Portfolio courses; and
- A list of the additional workplace experiences they plan to undertake to acquire any learning they will require to complete the program.

Figure 2 shows the relationship between the components of the Pathway to Graduation plan.

[Figure 2 about here]

If a student's Pathway to Graduation Plan is approved by university staff then the students will be able to continue in the program. If, however, the assessment of the plan demonstrates that the student does not have the required knowledge, experience, attributes or capabilities to be able to satisfactorily complete the program then the student will be cancelled from the program and counselled on alternative ways to achieve their goals, such as completing the Bachelor of Engineering program. In this case, if students have passed the course ENG8300, then they will be granted an exemption in another course when they enrol in another program offered by the Faculty.

Because an approved Pathway to Graduation Plan is regarded as a learning contract between a student and the Faculty, the student will graduate from the program once all of the components listed in the plan have been successfully completed. It is therefore critical that this is understood by both staff and students when negotiations are carried out whilst the Plan is being prepared. Once the Plan is approved there must be a significant level of trust between the parties until such time as the contract is either completed or lapses (Jarvis *et al.* 2003).

The Plan would not satisfy all of the requirements of the learning contract described by Knowles (1978 pp198-203) as the students do not define their learning objectives. But, as Jarvis *et al*. (2003) suggest, because the learners do not know what they have yet to learn they may not have the knowledge to be able to define their learning objectives. More importantly, in the case of the MEP, the learning outcomes are to a great extent defined by the accrediting authority, Engineers Australia. It is because the program is accredited that students will want to undertake the program as they seek the resulting recognition.

Although there have been some negative experiences with learning contracts, they are seen by their advocates to have a number of advantages for students:

- *'They provide students with a greater sense of control over the learning process.*
- *They strengthen students' motivation to learn.*

- *They encourage deeper and more holistic (rather than surface approaches) to learning.*
- *They encourage self-assessment.*
- *They develop students' skills in planning their own learning, and encourage them to plan for future learning.*
- *In continuing education, they encourage practitioners to reflect on their current practice.*
- *They encourage cooperative and sharing approaches to learning'*.

(McAllister 1996; Henfield *et al.* 1988; and Richardson 1988 in Jarvis *et al.* 2003 p108).

If these advantages accrue from the contractual nature of the MEP then the students will benefit from this learning mechanism.

7. Conclusion

The Master of Engineering Practice is an innovative program that was specifically developed to enable experienced engineering technologists to progress to professional engineer status by utilising their workplace learning. The design of the program is grounded in educational theory and practice, particularly those aspects relating to adult learning. The adopted pedagogy requires students to be self-directed learners as each student follows their own learning pathway through to graduation. To do so they will need to use high level reflective practice and written communication skills. The first cohort of students have recently commenced the program and it appears that they are rising to the challenges that they are confronting in the Master of Engineering Practice.

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Appendix A

The generic graduate attribute and capability statements for the program

Graduates of the Master of Engineering Practice program will possess, to a substantial degree, the following generic attributes and capabilities:

MEP1 *An ability to function effectively as a developing graduate Professional Engineer;*

MEP2 *An ability to function effectively in a team situation, in the engineering industry, and in the wider community;*

MEP3 *A capacity to manage priorities, resources, and change in an engineering environment;*

MEP4 *An ability to efficiently gather and effectively utilise information from the range of sources relevant to their field;*

MEP5 *An understanding of, and ability to apply, knowledge of engineering fundamentals and basic science, including computing and mathematics;*

MEP6 *An ability to communicate effectively in English, in a variety of modes, not only with engineers and other professionals, but also with the community at large;*

MEP7 *An ability to apply problem solving techniques encompassing: problem identification, formulation and solution; a capacity for analysis, evaluation and synthesis; decision making; and initiative, innovation and creativity;*

MEP8 *An ability to plan and create engineering designs that meet a client's requirements;*

MEP9 *A knowledge of, and ability to apply, the principles and tools used for sustainable design and development; and*

MEP10 *A knowledge and acceptance of the ethical, cultural, economic, environmental, legal, social and workplace responsibilities of the professional engineer in both a local and global context.*

Appendix B

The graduate attribute and capability statements for Electrical and Electronic Engineering Major in the Master of Engineering Practice program

In addition to the generic attributes and capabilities, graduates from the Electrical and Electronic Engineering major will possess, to a substantial degree, the following technical attributes and capabilities:

ELE1 *An ability to understand and apply computer engineering techniques to solve engineering problems;*

ELE2 *An ability to understand and apply control and/or signal processing techniques to the solution of engineering;*

ELE3 *An ability to apply electronics and communication techniques to solve engineering problems; and*

ELE4 *An ability to utilise electrical energy to solve engineering problems.*

Appendix C

Design Template for ENG8300 Self-Assessment Portfolio

This course is designed to enable students to undertake a review of their current attributes and capabilities and to demonstrate that they have the required knowledge, experience and skills to undertake the Master of Engineering Practice program. To do this they will demonstrate that they have acquired the appropriate attributes and capabilities as defined in Objectives 1 to 3 which, together with the associated Defining Activities, are drawn from the Engineers Australia Stage 2 Competencies. The source of each Defining Activity is referenced in the right hand column of the table.

Course Objectives and Defining Activities				MEP Defining Activity	EA Defining Activity
Objectives		**Defining Activities**			
1	Demonstrate developing capability to practice as a professional engineer	a)	Demonstrates use of appropriate engineering techniques and tools.	1.4 (a)	C1.1 (b)
		b)	Produces outcomes that require innovative thought and intellectual rigour.	1.4 (b)	C1.1 (c)
		c)	Identifies opportunities to solve problems through applying engineering knowledge.	1.4 (c)	C1.1 (f)
		d)	Demonstrates an awareness of environmental / community / political issues that would benefit from an engineering input.	1.4 (d)	C1.1 (g)
		e)	Publishes the outcomes of innovation in reports or professional papers.	Optional	C1.1 (d)
		f)	Achieves recognition for engineering expertise from colleagues and clients.	Optional	C1.1 (e)
2	Demonstrate ability to take professional responsibility	a)	Maintains the currency of their knowledge and skills.	10.2 (a)	- -
		b)	Recognises the limitations of their knowledge, skills and experience.	10.2 (b)	- -
		c)	Identifies professional risks, statutory responsibilities and liabilities	10.2 (c)	C1.5(b)
		d)	Practices in a field of engineering, in accordance with the Code of Ethics, as a significant part of normal work duties.	10.4 (b)	C1.1 (a)
3	Independently pursue continuing professional development	a)	Recognises the need for professional engineers to maintain the currency of their technical and professional skills and capabilities	1.2 (a)	- -
		b)	Reviews own strengths and determines areas for development	1.2 (b)	C1.2 (a)
		c)	Is aware of the scope and range of professional development activities in their field.	1.2 (c)	- -
		d)	Plans for further professional development.	1.2 (d)	C1.2 (b)
		e)	Undertakes engineering professional development activities.	1.2 (e)	C1.2 (c)
		f)	Seeks a range of information sources to develop and strengthen present engineering focus	1.2 (f)	C1.3 (b)
		g)	Improves non engineering knowledge and skills to assist in achieving engineering outcomes	1.2 (g)	C1.2 (d)
4	Demonstrate a high level of written communication skills	a)	Writes clear and accurate technical reports	6.2 (e)	
		b)	Writes fully documented progress reports	6.2 (b)	C3.5 (f)

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Figures & Tables

Figure 1: Articulation pathways for Engineering Technologists

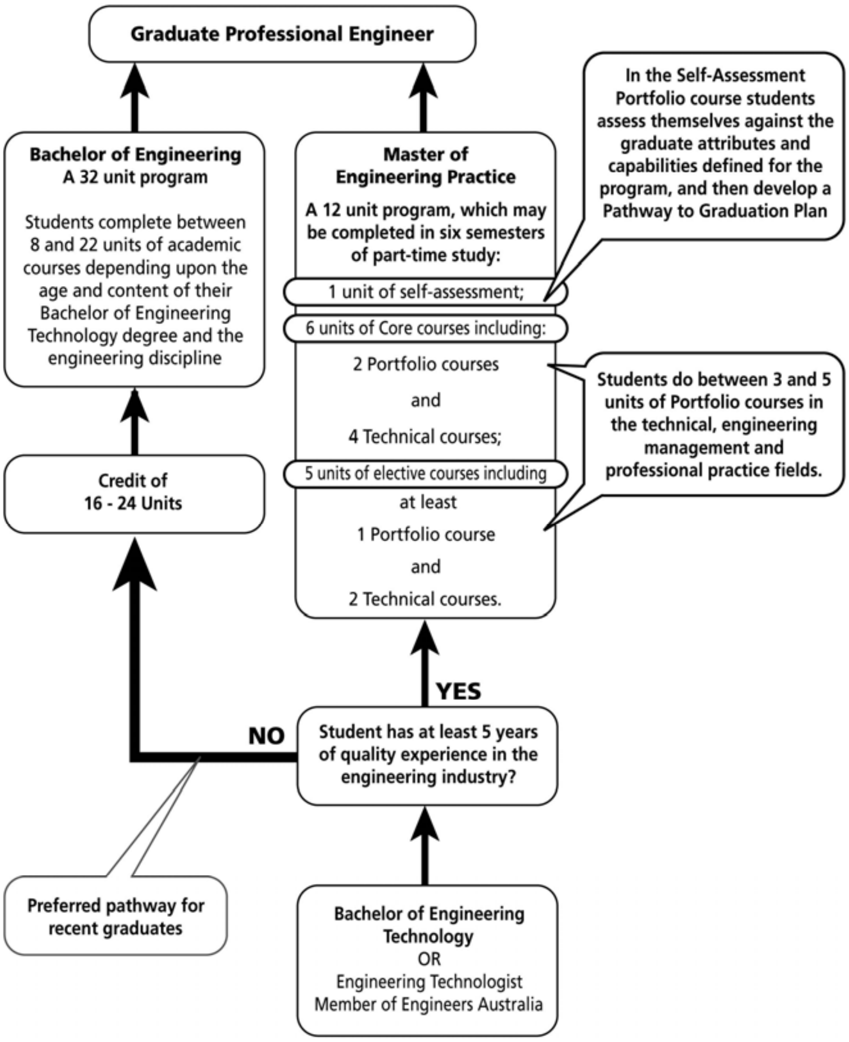

Figure 2: The Relationship Between the Components of the Pathway to Graduation Plan

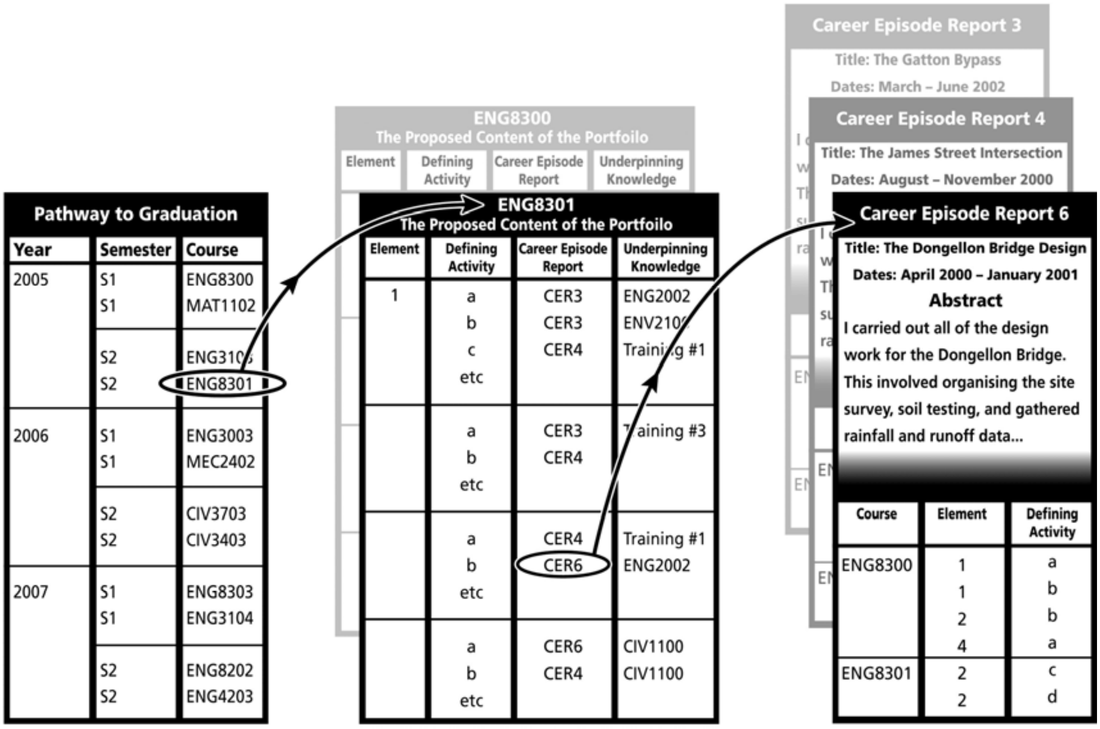

Table1: The Objectives and Defining Activities defined for MEP1.

MEP1: An ability to function effectively as a developing graduate Professional Engineer Explanation: In today's multi-disciplinary workplace environment it is essential that graduates: have the skills required to work independently in the engineering industry; recognise the role of, and need for, personal and professional development; have the capacity to be an independent learner; and are developing a professional image.		
Objectives	**Defining Activities**	**EA Defining Activities**
1.1 Manages self	a) Manages own time and processes. b) Exercises initiative in the workplace. c) Completes tasks in a competent and timely manner. d) Copes with change.	a) C3.1 (a) b) C3.1 (b) c) C3.1 (c) d) C3.1 (e)
1.2 Lifelong learning	a) Recognises the need for professional engineers to maintain the currency of their technical and professional skills and capabilities. b) Reviews own strengths and determines areas for development. c) Is aware of the scope and range of professional development activities in their field. d) Plans for further professional development. e) Undertakes engineering professional development activities. f) Seeks a range of information sources to develop and strengthen present engineering focus. g) Improves non-engineering knowledge and skills to assist in achieving engineering outcomes.	a) -- b) C1.2 (a) c) -- d) C1.2 (b) e) C1.2 (c) f) C1.3 (b) g) C1.2 (d)
1.3 Independent learning skills	a) Masters and assimilates new knowledge and techniques as an independent learner.	a) --

About the author

Associate Professor David Dowling is the Associate Dean (Academic) in the Faculty of Engineering and Surveying at the University of Southern Queensland. Whilst he has a background in land surveying, the major focus of both his work and research are related to the enhancing the teaching and learning environment for students. This includes graduate attributes and capabilities, curriculum design, the induction of academic staff, and research into the factors that influence student success, particularly those that impact on student success in their first year of study at USQ.