Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Strategic objective addressed: Student Engagement

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Executive Summary

In 2010, the School of Business IT and Logistics initiated a pilot investigation into the feasibility of having students create learning e-portfolios. These portfolios were designed to foster learning across the curriculum and to operate for the entire duration of the students’ enrolment at RMIT. A particular project focus was to explore how such portfolios might strengthen RMIT’s graduate outcomes.

In the three degrees involved, no credit points were currently available for the completion of portfolio work. This absence also meant that limited staff resources were available.

Several surveys explored students' beliefs involving graduate attributes. Before the project commenced, sizeable proportions of students considered that they had achieved substantial levels of mastery. Students, further more generally expressed strong support for continued personal development.

Lecturers teaching in the degrees involved were surveyed to establish the extent to which the courses offered opportunities to explore graduate attributes. Indications were also collected concerning whether or not students exposure to such opportunities involved formal assessment. Analysis suggested that considerable attention was being paid to the idea of work readiness and the fostering of critical thinking in the 40 courses examined.

Educational design involved in this portfolio project concentrated attention on the development of reflective practice. Students had to maintain a continually updated Brand You statement. This exercise prompted students to identify what value they offered to other people and organizations. Claims about value had to be supported with appropriate evidence. Students were also required to identify ongoing processes used to sustain personal capabilities. Most students found this to be a challenge. Approximately 60% of students in the target cohorts initially engaged in the process. In the longer term, however, participation rates fell away because no credit points were involved. Such an exercise offers interesting potential in having students engage attribute development in the direct and personally meaningful context. Nonetheless, to be effective, the exercise must be formally assessable to sustain worthwhile results.

A second portfolio component involved the creation of detailed skills maps. The content was extracted from recent industry sources that have expressed interest in such skills formation. PebblePad is well designed to have students use such maps to document learning. In 2011, the school is pilot testing these maps with students. In 2012, school envisages that the maps will become integrated into formal assessment requirements.

Fostering graduate attributes is immeasurably easier for lecturers and students if there is a readily available source of materials to support them. The project team soon discovered that RMIT had created little in the way of such support. To remedy this deficiency, the project team created substantial guide to publications relevant to graduate attributes identified in the University’s learning and teaching strategy.

A particularly interesting finding involves consideration of mindset. Mindset means understanding the implicit theories that teachers and students hold about what can be achieved through learning. The project's findings suggest that approximately 1/3 of students appear to subscribe to a fixed mindset rather than one that involves more growth oriented perspectives. Other researchers have suggested that adherence to a fixed mindset may involve serious limitations when it comes to personal professional development.

Team members are to continue investigating this area. Particular focus is directed to the possible altering of mindsets as well as collaborating with overseas researchers who are creating an online learning platform that allows for a better understanding of mindsets.
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Experience also has led to project team to conclude:

1. The form of portfolio that is likely to produce the most deep-seated worthwhile changes is concentrated at the degree rather than a particular course level.

2. Such initiatives are pointless unless an appropriate quantum of credit points is allocated to student portfolios.

3. Existing RMIT practice concerning allocation of credit points does not facilitate curriculum initiatives involving portfolios. A review of policy is needed.

4. Serious undertakings in portfolio development and management require substantial revisions in teaching and learning practice. For example, in the case of generic skills development lecturers need to broaden their educational intent beyond the traditional focus on academic disciplines. Structured use of portfolios generally necessitates a high degree of experiential learning. Effective use of portfolios also requires greater use of self-directed learning. Such learning poses important challenges for both teachers and students. Some considerable new level of effort has to be mustered if RMIT is going to be serious about portfolios and graduate attributes.

5. Experience suggests that most of the school’s lecturers were not easily inclined to shift their efforts to support such educational reforms. They hold a belief, whether accurate or not, that placing concentrated effort into improving learning and teaching does not pay off sufficiently when it comes to how they view job security and promotional prospects. If RMIT wishes to make significant progress with student portfolios and the fostering of graduate outcomes then the university faces a significant challenge. It involves recalibrating perceptions involving the worth of research relative to that of teaching and learning.
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A list of outcomes
The project produced the following outcomes.

- Approximately 280 commencing students in information systems in the School of Business IT and Logistics (SBITAL) were introduced to the concept of e-portfolios through the use of PebblePad software. One undergraduate degree as well as one post graduate course work degree both which operated at the city campus were involved. Offshore a third postgraduate degree offered at the Singapore Institute of Management was included.

- Students were asked to commence creating a professional development portfolio (PDP) that would plot aspects of learning across their entire degree for as long as they were a student.

- Students participated on a voluntary basis as no credit points were assigned for portfolio engagement. In the time available for the project, it was not feasible to change degree structures and initiate minor program amendments that would significantly improve the motivational pull of the portfolios by assigning academic credit to their completion.

- Approximately fifty percent of the potential candidates targeted in the project attempted to make a meaningful start to the portfolio process. As a semester proceeded, however, interest and participation tended to fall away because effective student participation was not linked to securing credit points.

- The initial major component of the PDP involved a process called “Brand You”. Students were required to develop a brand statement. In addition to identifying how they offered value to other people and institutions, the statement requested students to offer evidence for their claims and to describe their processes for creating and sustaining value. This was a challenging exercise for many students. While it is clear that such a statement was able to prompt many students to think more deeply about personal goals and how these connected to study and work, the project also revealed that if students were to benefit they would need to continually practice this process. Such practice would ideally occur at least three times annually throughout their entire candidature as an RMIT student. Reasonable levels of mastery would only be achieved if there were sufficient iterations of the process. Students who engaged meaningfully in the Brand You process are likely to have improved their ability to create higher quality job applications. Substantiation of this potential benefit, however, can only be confirmed over time. Most of the participants were commencing students who will take several years to graduate. The School is continuing work with Brand You in 2011.

- A range of forms and presentations has been created to support the Brand You component of PDP development in the SBITAL.

- A portion of the Brand You process also required students to report periodically about how their studies allowed them to realise learning related to RMIT’s designated graduate attributes. Most students who did participate had particular difficulty in offering relevant comment in response to this request. They were often unable to describe examples of things they had done that might be construed as having explored an opportunity relevant to the partial realisation of growth of learning linked to attribute learning. This inability to offer relevant commentary is probably explained by a cluster of factors. Nonetheless, project team members have formed the opinion that initially students regardless of their level of study typically need considerable mentoring to be able engage graduate attribute development in a meaningful way. Such a way also appears to be heavily reliant on developing self-directed learning competencies in the students. These developments realistically take at least several semesters to develop.

- Three surveys of students in information systems were conducted to establish what self perceptions students held concerning their competency with respect to each of RMIT’s designated graduate attributes, their degree of interest in further learning in such areas, and the current level of opportunity available to explore such attributes. The report provides
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- a rich array of information about these matters. A fair portion of the information published separates the views of Australian students from their international student counterparts.

- In general, a majority of students claimed high levels of proficiency and self professed interest in most of the attributes. Nonetheless, one has to be somewhat sceptical about such student opinions concerning the level of competency claimed. This is especially evident when these claims of competency are set against the difficulty that many students had in describing what concrete things that they had done relatively recently that were allied to the fostering of such attributes.

- Colleagues interested in examining student opinions about graduate attributes should find these results and the related instruments to be a helpful starting point.

- The project investigated the mindset of M.Bus (IT) students to uncover what implicit theories they held concerning the ease with which learning might alter graduate attributes. The findings suggest that at least a third of those surveyed at RMIT subscribed to a fixed mindset when it came to beliefs about intelligence. Some prior researchers consider that such a mindset interferes with personal learning and related professional development. Participants were also queried about each of RMIT’s graduate attributes. The intent here was to establish to what extent students had either a fixed or growth oriented mindset about such attributes. Several of the attributes were associated with a sizeable proportion of respondents holding pessimistic views about the extent that attributes could be cultivated. Before embarking on projects involving enhancing attributes, teachers are well advised to ponder upon the influence of prevailing student mindsets.

- Students who completed the mindset instrument were fed back the findings. The project team subsequently prompted these students to reflect upon the results. In particular, students were asked to consider if acquiring relevant learning was immutable as about a third of respondents suggested it was.

- Two workshops were conducted for the benefit of SBITAL staff on the issue of mindset. The focus of these gatherings was to have lecturers reflect upon their own beliefs as well the ramifications of student views.

- At the outset of the project, it was apparent that most lecturers had only a vague understanding of the priority graduate attributes identified in university’s teaching and learning strategy. Furthermore, it was unclear about the extent to which lecturers dealt with the attributes in their teaching and assessment. The project team therefore decided to map the presence of attribute development in forty of the school’s courses. This aspect of the project had two specific aims. Lecturers were required to make a systematic analysis of their courses. They had to map the possible presence of over forty opportunities that might be used to assist the development of attributes. In so doing, lecturers became more aware of the character of these attributes. A second intent was to establish what patterns of current curriculum support for attribute development existed in the school. The results suggest that generally lecturers considered they offered substantial support to preparing work ready students as well having students think critically when it came to decision-making and learning. Some of the other attributes, however, apparently receive considerably less attention.

- The project team decided that if portfolios were to be an effective tool across the life of a student’s enrolment then there was a need to produce skills maps. Students could use such maps to guide learning and to record their progress. Such student use has particular potential to help cultivate attributes involving active and lifelong learning. The degrees involved in the project initially had no such maps beyond simple capabilities lists. Those lists were too superficial to guide effective acquisition of relevant skills. The team therefore constructed several skills profiles. These have been installed using the Profiler tool available in PebblePad. The content of the profiles was drawn from emerging skills frameworks being developed in the ICT industry. This content was supplemented with the recent opportunities list associated with RMIT’s graduate attributes. Other ideas were extracted from the Core Body of Professional Knowledge (CBOK) of the Australian
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Computer Society. That external agency accredits these degrees. One of the aims behind the creation of these maps was to strengthen the probability of successful future accreditation. Such accreditation will fall under the auspices of the Seoul Accord. This accord increases the possibility that RMIT IS graduates will more freely have their qualifications recognised across several national jurisdictions. Use of these profiles is being pilot tested by students on a voluntary basis in 2011. Following current program revisions in train, the SBITAL anticipates that use of the profiles will become a compulsory element of student assessment commencing in 2012.

- Fostering attributes was in part limited by the lack of content resources available to aid lecturers and students. To offset this limitation, the project team produced a guide to publications relevant to the exploration of graduate attributes that RMIT has expressed particular interest.

- The project team has undertaken preliminary investigations into considering how lecturer feedback to students about their portfolios might employ audio-visual options. The progress of this exploration, however, was delayed because of the interruptions arising from building renovations where the College of Business is housed. These investigations are scheduled to resume in semester one of 2011.

- Finally, the project team examined how aspects of RMIT’s academic governance supported the use of degree level portfolios that were to be maintained over the entire duration of a student’s degree candidature. To be effective, such portfolios need to be managed as a discreet entity that attracts sufficient credit points. Without such allocation of credit, insufficient staff resources will be allocated to student portfolios to make their operation feasible and worthwhile. Likewise, without a sufficient quantum of credit points being allocated every semester most students will not make the effort needed to confront the reflective practice challenges involved in portfolios. Students generally therefore in voluntary use of portfolios are unlikely to secure substantial potential gains that can arise from a well-coordinated portfolio program. RMIT’s credit point policy dictates that the smallest course component must attract at least 12 credit points. This rule frustrates the creation of a credit point regime that would ideally support the continued and effective use of degree level portfolios. The project team therefore intends seeking reform of the existing policy involving credit point allocations.
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**List of the acronyms**

ACS Australian Computer Society
AFP Australian Fee Paying
ALTC Australian Learning and Teaching Council
BB(BIS) Bachelor of Business(Business Information Systems)
CBOK Core body of knowledge
EBP Evidence based practice
GMLP Growth Mindset Learning Platform
ICT Information and communication technologies
ION International Onshore
LMS Learning management system
LTIF Learning and Teaching Innovations Fund
M.Bus(IT) Master of Business(Information Technology)
MIM Master of Information Management
PDP Professional Development Portfolio
RMIT Royal Melbourne Institute of Technology
SBITAL School of Business IT and Logistics
SFIA Skills Framework for the Information Age
SIM Singapore Institute of Management
TEQSA Tertiary Education Quality and Standards Agency
WIL Work integrated learning
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1. Project aims and objectives

1.1 Project description

The project sought to create and evaluate e-portfolios using PebblePad software to provide an integrative framework for mapping student understanding and attainment of generic skills. It aimed to address attributes or generic skills identified as critical by the university, within disciplines and associated with accrediting professional bodies.

A second portion of the project focused on personal development processes of students by employing a "Brand-You" concept popularized by Peters (1999). Its inclusion sought to link attribute accomplishments with job prospects.

Various sets of evidence pointed to the need for better understanding of graduate attributes.

- Surveys and interviews conducted in the then School of Business Information Technology in October and November 2009 indicated that students in the school had poor comprehension of RMIT's primary graduate attributes as stated in the Learning and Teaching Strategy.
- There appeared to be little connection between comprehensions of these attributes and how students might positively describe their own worth.
- These sources indicated that there was likely a significant opportunity to improve attribute development associated with innovation and sustainability.
- Likewise, questioning of the school's academic staff at that time suggested generally most lecturers had a poor understanding of the premium attributes identified in the Learning and Teaching Strategy.
- Finally, results from CEQ, CES, and SES surveys consistently indicated that there was still scope to improve feedback to students in the School and more generally within RMIT. Experimentation with the idea of "Brand You" therefore offered a potentially novel way to offer students enriched commentary beyond traditional practices involving feedback to learners.

The project was initiated in the following context.

The student cohorts in the SBITAL involved included:

- All new entrants to the Bachelor of Business (Business Information Systems) (BB(BIS)) in semester one of 2010. One hundred sixty four students were initially engaged.
- All students enrolled in the Master of Business (Information Technology) at the Singapore Institute of Management (SIM) from January 2010. Any at time during the year, approximately 35 students were participants, depending when they commenced or concluded their studies.
- All new entrants enrolled in the M.Bus(IT) in Melbourne during semester two of 2010 were invited to participate. Initially 67 students made up this cohort.

In each degree, there was no formal requirement that students had to complete a portfolio in order to graduate.\(^1\) Student engagement in the project therefore had to rely on voluntary student participation.

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\(^1\) In this instance, formal requirement means that credit points would be allocated to the creation and presentation of portfolio that described learning achievements accomplished across an entire degree.
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In part, the project assumed that the fostering of graduate attributes needed to address the following issues.

A. An integrated and sustainable framework. Currently, attribute linked projects such as global passport, work integrated learning, innovation and e-portfolios were insufficiently connected. Instead, there was a need to create a framework that consistently reinforces the development of graduate attributes at the program level for the entire life of the students’ enrollment.

B. Any such incubator had to maximize student achievement. A recent extensive meta-study (Hattie, 2009) into learning indicated that by far the most potent variable involved student expectations concerning accomplishments. This factor was twice as powerful as any variable associated with the teacher domain. Cultivating student goal setting involving graduate attributes at the outset of enrolment therefore is more likely to maximize student achievement. There was ample evidence that e-portfolios, if appropriately managed, can foster and sustain such goal settling and achievement of subsequent learning (Jarafari & Kaufman, 2006; Zubizarreta, 2009).

C. E-portfolios to document accomplishments associated with graduate attributes needed to employ a sustainable feedback system. Use of audio and video comments from staff to students offered the prospect of a cost-effective approach when evaluating portfolios. Some recent research concerning voice feedback suggested that students perceive such messaging to have greater integrity (B. Rotheram, 2009). Furthermore, there were indications from such research that students were more likely to act on suggestions made orally using sound files rather than they will in respect to written remarks.

1.2 Project Rationale

The project sought to satisfy aspects of the overarching LTIF priorities involving e-learning and use of information technology. The following comments were offered originally in respect of the LTIF justification criteria when the project sought funding.

Improved student learning experiences, outcomes and employment opportunities
The project aimed to better integrate learning experiences with attribute development. This required reconsideration of attributes as perceived by relevant stakeholders. Attribute development was also linked to employment possibilities through the use of the brand you process.

Innovation
The project hoped to experiment with audio and video files to create a cost effective commentary on the progress of the portfolios. To date, such an approach appeared to be underused and therefore offers potential beyond portfolio assessment.

Strategic alignment
The project aimed to support the realization of a major plank of RMIT’s learning and teaching strategy. Likewise, it supported features contained in the 2010 Business Plan and to the Graduate Attributes Implementation Plan for 2010-2014. In addition, the project’s work on attributes was relevant to a likely assessment framework being foreshadowed by several commentators for the new Tertiary Education Quality and Standards Agency (TEQSA).

University wide application
The creation of relevant documentation and samples of student portfolios offered a potentially rich collection of resources to support the further realization of program level graduate attributes across RMIT.

1.3 Modification of project intents

Once the project commenced, experience gained and events beyond the team’s control prompted some adjustments to project aims. The rationales behind these adjustments are briefly described here.

Creation of a resource guide: Initially, the project team members had somewhat naively assumed that as they got students to engage in portfolio development this would result in students being
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs able to describe examples about how they had engaged in meaningful exploration of generic attributes. It had been hoped to these accounts might form a bank of authentic and contextualized examples to illustrate each attribute. Such a bank might then be shared with lecturers and students across RMIT.

As the project proceeded, it became increasingly apparent that almost all students participating in the project were unable to offer tangible examples about how their studies and life experiences were leading to positive learning outcomes related to the RMIT graduate attributes list. The bank of experiences concept therefore became untenable.

Allied to this challenge there was the problem that at the time when the project commenced RMIT has produced next to nothing in the way of curriculum resources that might assist teachers and staff wanting to explore the attributes in a meaningful way. Indeed, RMIT lagged behind several other universities that had expressed a similar strategic interest in graduate attributes. Those universities had published a useful range of materials and sources that would potentially support the strengthening of graduate outcomes.

Clearly, there was a need within RMIT for some form of relevant resource building. The project team therefore switched its focus to creating a tool that might assist RMIT teachers and students. The appended guide to RMIT’s graduate attributes therefore was developed as a more logical starting point for resource development.

Use of audio and video feedback concerning student portfolios: In the original project specification, the team had intended exploring the use of audio and video feedback. The intent here was to see if it was possible to replicate some of the positive findings concerning this approach when trialed in the United Kingdom. Some exploratory research was undertaken to review suitable software for this purpose. The team decided to use Camtasia. The product was sufficiently flexible to create instructional video where the screen output arising from PebblePad could be merged with a video feed of lecturer commentary. Licenses for both MS Windows and the Apple Mac operating system were then purchased. Several technical trials were also performed to identify which delivery channels for audio-visual feedback might best serve this function. Further progress with this aspect of the project was then delayed.

The principal reason for the delay arose out of the significant disruption to teaching and learning processes in Building 108 caused by the extension building works undertaken to remediate potential health and safety risks. Use of computer laboratories became increasingly restricted. Staff and student timetables were disrupted thus eroding time available to work on the LTIF project. Team members as a result decided to concentrate on other deliverables associated with the project. Further progress with this portion of the original project brief has now been shifted to semester one of 2011.

Increasing focus on student mindset: During semester one of 2010 as work proceeded on having students write about their personal brand and how they might engage RMIT’s graduate attributes the project team became more interested in students’ implicit theories about self and learning. Increasingly the team became aware that a sizeable proportion of the students involved in the project held implicit views that potentially hindered serious engagement with the idea of graduate attributes let alone their learning in general. Survey work was undertaken to further tease out these suspicions involving the impacts of mindset.
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2. Portfolio process model

Introduction
To guide the project's direction the team created an overall picture of the knowledge of the processes and knowledge to be explored by students and lecturers. The following section describes the various reasoning behind each of the components included.

Version one of the project model
At the project’s commencement, a model was created to inform students how a range of issues and processes were connected. See Figure 1.

Lectures and documents distributed used this representation of the model first with M.Bus(IT) students in Singapore early in 2010.

The following commentary outlines the underlying thinking concerning each part of the model.

The starting point deliberately commenced with the idea of sensing change. Several factors prompted this choice. Information technology has been one of the driving forces in global economic development. Information systems professionals often find themselves placed on the edge of organizational change. ICT typically offers new ways of completing business processes.

The project team therefore considered one potentially productive way to have IS students think about the development of generic-type graduate attributes was to link it with coping with change. The proposition developed suggested that fostering one’s graduate attributes would assist students to develop a capacity to deal with change. Students were asked to consider how creating better mastery of RMIT graduate attributes might help them form a capacity to re-skill themselves effectively in the face of change. Furthermore, students were prompted to contemplate if effective transformation of this kind represented a form of competitive advantage.

This prompting was stimulated by exposing students to a series of recent findings concerning the rate of change in modern economies. Particular attention was given to research that demonstrates the rate of change over the last 15 years appears to be accelerating.

In the face of these facts, it was emphasized to students that the capacity to manage personal renewal of skills effectively was likely to become more important in the future. In such a future that rate at which such transformation might need to occur would be significantly faster than that required of earlier generations.

Hence effort was made to link graduate attribute development to being a form of personal insurance for dealing with change. It was hoped that such a starting point might engage students.

To offer empirical backing to highlight to students the need to address the prospect of accelerating change, the project referred them to the Shift Index. This index created by the Deloitte Center on The Edge (Deloitte, 2009) has processed a wealth of data for the US economy. The analysis covers from 1993 until 2008. From these data Deloitte’s strong conclusion is that the rate of change in the US economy appears to be accelerating.

Students in the project received copies of this research as well as a more popular version published in the Harvard Business Review (Hagel, J., J. Seely Brown, and L. Davison, 2009a).

LTIF Project presentations made to students highlighted the need for them to consider what would be the likely ramifications of these economic, social, and technological movements for their careers. Furthermore, students were asked to consider how they might create a general set of capabilities that would permit them to transform themselves in the face of change. It was suggested that constantly seeking to strengthen the capacity to embrace RMIT’s graduate attributes could be a substantial step towards realizing such a transformation.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs.

Figure 1 Version one of the LTIF project model
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

As IS students, they were also asked to consider the ramifications of Moore's Law. In its general formulation, this law suggests that the potential cost effectiveness of information technology doubles approximately every 18 months. Such changes in cost-effectiveness represent a principal driver of change in most economies. Such change has profound ramifications for organizational processes. Supply chains have the potential to be revised constantly.

**Figure 2 Deloitte’s Flow Index**

![Flow Index Graph](Source: Deloitte analysis)

Source: (Deloitte, 2009)

When Moore's Law is first raised with most students, it always somewhat of a surprise to see that initially so many undergraduate and postgraduate students in information systems remain unaware of this phenomenon.

**Figure 3 Deloitte’s Foundation Index**

![Foundation Index Graph](Source: Deloitte analysis)

Source: (Deloitte, 2009)
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

In the LTIF project, the matter of this law was raised not only because of its relevance information systems, but to assist in setting the scene. This scene sought to provide students with an imperative to consider the development of graduate attributes seriously.

The second portion of the first model used in the project highlighted three “tool” areas. These tools included reflective practice, learning theory, and evidence-based practice.

The underlying rationale behind identifying these tools was that some competence in these three areas had to be developed if graduate capabilities were be fostered effectively.

Figure 4 Deloitte’s Impact Index

![Figure 4 Deloitte’s Impact Index](image)

Source: (Deloitte, 2009)

Reflective practice lies at the heart of attribute development. If student portfolios are to be effective in generating worthwhile learning, students ultimately need to become highly proficient in making and using such reflections.

In the project, students were asked to produce several reflections concerning their experiences with Brand You and more generally about the direction of their portfolios.

Presentations made to students reviewed what was involved in producing such reflections. In addition, students were referred to a variety of online sources that dealt with how to produce critical reflections.

Generally, students struggled to write evaluative reflections that dealt with the progress of their learning. This outcome applied to both undergraduates and postgraduates in information systems.

This result is consistent with the experience of teaching M.Bus(IT) students over the last decade. Typically, reflection diaries used as elements of assessment reveal weak skill in reflective practice. This observation appears to relate especially to ION students.

If RMIT is serious about seeing better generic skills development in its graduates’ consideration of how to be better support development of how to reflect critically about learning becomes more important.

Version 1 of the LTIF model identified learning theory as another basic tool that offers an important foundation. Attribute development implies that students and graduates become effective self-directed learners. To achieve this necessitates students acquiring some marked competence in self-directed learning. Indeed, hopefully, student portfolios should offer ample evidence of such competence.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

In the project, therefore, students were directed to several sources about learning.

Reference was made to Kolb's Learning Cycle (Kolb, 1984). This schema sets out a four-stage model associated with learning. It is useful for students to consider the model when they come to reflect critically on their learning. The model, moreover, proves useful when students are asked to take responsibility to try to trace learning cycles. The model can be equally useful when students are being prompted to design and execute their own self-directed projects, especially those that might concern the development of RMIT's graduate attributes.

In recent years, greater interest in the application of the findings from neuroscience to education has become evident. If a student portfolio is supposed to be an effective exercise in self-discovery, it seems appropriate to have students consider how the brain works. Students can then apply gaining such insight when they reflect upon their own learning practice. To further this end, students in the project were given access to a topical article that explained these matters (Willis, J, 2009b). Furthermore, this connection was discussed during face-to-face lectures given to students over the project's life.

The remaining area of educational matters that students were directed to in this LTIF project involved the fostering of talent.

Elsewhere in this report, we discuss the issue of mindset and its ramifications for learning. That discussion centres on examining the limitations of a fixed mindset. Such a mindset can too easily suggest the capacity to achieve in many areas is fixed—such fixture being related to the notion that genetic predisposition is the overwhelming factor at play.

Raising the issue of talent creation was included for several reasons. First, it is likely to attract student attention—certainly for those students with a more aspirational bent. Secondly, consideration of talent raises several potentially important issues involving the use of portfolios. These matters include:

- Examining to what extent are talents fixed and what is the empirical basis underlying talent creation; and,
- Considering research into fostering talent that suggests its accomplishment is largely a function of appropriate practice (Gladwell, 2009; Colvin, 2010; Coyle, 2008).

Such findings point to an important practical consideration when designing learning schedules for degrees as well as for learning documented in portfolios. In particular, there is the issue as to whether or not sufficient iterations of important skills are being managed appropriately throughout a student's entire enrolment. For example, if cultural awareness is to be facilitated effectively as a priority, it needs to be addressed constantly in all or at least most semesters. The weakness in degree design can be that insufficient attention is given the creation and management reinforcement loops throughout the life of a program. Properly managed, a degree level portfolio has the potential to offset the potential weaknesses related to insufficient practice and insufficient reinforcement of sought after attributes.

The body of findings about talent creation emphasizes to students the degree of application that is necessarily required to achieve significant accomplishments. Ideally if RMIT's graduate attributes are truly important then these need to be tackled head-on from the outset and then repeatedly.

There is an important connection to be made between mindset, neuroscience and talent creation. The sustaining of cognitive function throughout life comes only if individuals engage in learning that offers a challenge. Without that stretch, there are few or no necessary biochemical changes in the brain.

Sensibly, therefore the fostering of RMIT's graduate attributes needs to be fashioned in such a way that learning is not going to be comfortable. By its very nature worthwhile learning is associated
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs challenge and having to stretch the limits of current performance. Care needs to be taken to see that the use of portfolios does not become associated with the low level of cognitive demands often associated with the rise of educational social media. Some commentators have suggested that overuse of such channels is collectively dumbing us down (Carr, 2010).

The final tool included in the project model is evidence-based practice (EBP). There is a strong case for arguing that EBP should be included explicitly in RMIT's formulation of graduate attributes.

There are several important dimensions involving the inclusion of this tool in the model.

The model itself relies on the EBP. For example, there is the empirical basis concerning accelerating change. There is what research informs us about how talent is created. In the longer term, all stakeholders in the fostering of graduate attributes need to be concerned about the cost effectiveness of various educational processes used to foster attributes. These illustrations show that it becomes impossible to divorce EBP from making progress with graduate outcomes. That being so, it is helpful if EBP is considered explicitly.

Academics can be inclined not to worry about fostering EBP as an explicit graduate outcome. Such reasoning proposes that universities are about creating knowledge through research. Too often it can assumed that through a subtle process of osmosis graduates will acquire a sufficient degree of critical reasoning to become proficient practitioners of EBP. Often, a compulsory course in investigated methods is seen as sufficient treatment of evidence-based issues.

Qualitative evidence-based practice has become an important ingredient in the preparation of graduates in many health sciences vocations. In contrast, the EBP movement is less well developed in many other occupations.

Teaching about EBP in the M.Bus(IT) both onshore and offshore over the last five years has revealed that most IS undergraduates have poor, if any, understanding of what evidence-based practice involves. This weakness also is often apparent in other masters candidates who have taken undergraduate degrees in other disciplines.

The version one model used in the LTIF project therefore included EBP as an explicit tool for students need to think about from the outset. Furthermore, as they document their learning in a portfolio, students need to address the issue of providing evidence. Properly encouraged, the portfolio can be viewed as an experience in the development skills that lead to becoming an evidence-based practitioner.

The next component in the project's model involved the idea of Brand You. Its conclusion was deliberate. From the outset, an aim of the project was to have students consider their own development in a catchy and direct way.

Rather than students belatedly thinking about their CVs immediately before launching job applications, the use of Brand You sought to have students consistently review their attribute development throughout the course of their studies.

The deployment of effort to cultivate graduate attributes sensibly needs to relate to employment outcomes. Getting students to explore such matters from the outset of their studies increases the accountabilities operating for several stakeholders. Lecturers and students are more likely to be prompted about employment trends and what capabilities prospective employers currently value. There are obvious opportunities to use EBP to reinforce the effective application of Brand You. A worthwhile constant stretch for all relevant stakeholders exists when the link to employment is connected to portfolio processes.

The remaining components of the model simply listed what the RMIT graduate attributes were and that the portfolio would be maintained using PebblePad software.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs.

Figure 5 Version two of the LTIF project model

My Professional (Personal) Development Journey

- I explore my mental models: Implicit theories about self and learning Mindset
- I sense changes: Shift happens Accelerating Change
- I use these tools to foster an effective response: Reflective Practice Learning Theory Evidence-Based Practice
- I incorporate these responses into sustaining my personal brand: I regularly update my “Brand You” Statement
- I record this journey in my e-portfolio: I assemble my evidence in a polished portfolio at RMIT

RMIT’s Graduate Attributes:
- Innovative
- Active Learner
- Life-long Learner
- Culturally & Socially Aware
- Work-ready
- Global in Outlook and Competence
- Environmentally aware and responsive
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

**Version two of the model**
Figure 5 displays the project’s second version of its overarching model. This revision repositions the matter of mindset to the beginning of the learning process.

Several reasons account for this repositioning. During semester one of 2010, surveys of M.Bus(IT) students exploring the aspects of mindset were undertaken the results of these investigations are discussed in more detail elsewhere.

In brief, those explorations suggested that about a third of M.Bus(IT) students adopt implicit theories of self that involve pessimistic views concerning the capacity to change fundamental abilities through directed learning.

Self-exploration into one’s implicit beliefs about learning and one’s capacity for self-development appeared to be more appropriate starting point. Both academics and students can usefully examine the relevance and frequency of such beliefs. Their presence also obviously shapes in part the attribute development that might occur from undertaking an RMIT degree.

In semester two of 2010, the project commenced feeding the survey findings involving mindset to academics and students. The aim here was to stimulate discussion and contemplation of what these findings might mean.

**Version Three**
This version depicted in Figure 6 is the current formulation of the conceptual model employed in the project.

The principal addition in this version involves the CBOK profile component of the portfolio project. While the Brand You component is a potentially interesting entrée to the portfolio, a more systematic approach is needed to constantly map student learning to expected vocational outcomes. Use of the profiling function in PebblePad is potentially a more disciplined way of achieving this goal.

A separate section of the report details the development of program level core body of knowledge profiles for the degrees involved in the project.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Figure 6 Version three of the LTIF project model

My Professional (Personal) Development Journey

- I explore mental models to consider how these impact on my learning
- I sense changes in the World
- I use these tools to foster effective responses to change
- I incorporate these responses into sustaining my personal brand
- I drive my learning through the profile map for my degree
- To strengthen my learning I use the tools to acquire RMIT’s graduate attributes
- I record this journey in my e-portfolio

- Implicit theories about self and learning
  - Mindset
- Shift happens
  - Accelerating Change
- Reflective Practice
  - Learning Theory
  - Evidence-Based Practice
- I regularly update my "Brand You" statement to strengthen my capacity to deal with change
- I regularly manage my learning using the CBOK profile for my degree and tools to demonstrate my capacity to foster an effective response
- I assemble evidence of my accomplishment with reflective practice, Brand You and CBOK degree profile in Palisade software at RMIT

- Innovative
- Active and Life-long Learner
- Culturally & Socially Aware
- Work-ready
- Global in Outlook and Competence
- Environmentally Aware and Responsive
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

3. Students’ initial beliefs about aspects of RMIT’s graduate attributes

In the semester before launching this project, students in the BB(BIS) and M.Bus(IT) onshore were surveyed about aspects of RMIT’s declared graduate attributes. The instrument is shown in Appendix 1.

In the case of BB(BIS), there were 50 respondents (giving a response rate of 11 per cent). There were 99 M.Bus (IT) respondents, which produced a response rate of 35 per cent. Overall, these figures produced response rate of 21 per cent. While the rate is low, hopefully, the results are indicative of IS students’ views at that time.

When the survey was undertaken, RMIT had produced scant information concerning its declared graduate attributes. The only meaningful statement available consisted of the following seven attributes published in the university’s Learning and Teaching Strategy.

- Work ready
- Innovative
- Life-long learner
- Active learner
- Culturally and socially aware
- Global in outlook and competence
- Environmentally aware and responsive

It is reasonable to infer that most staff and students had little explicit idea concerning the existence of this attributes list let alone its specific meaning. Certainly, in the School of Business Information Technology (SBITAL) the lexicon of RMIT’s graduate attributes did not feature explicitly in day-to-day learning and teaching practice. Other than a long held belief that RMIT produced students with a practical bent well suited to work, lecturers and students would have struggled to name the attributes.

The survey therefore was undertaken to gain further insight into how Information Systems (IS) students thought about the concepts listed in RMIT’s graduate attributes. As the list provided no further operationalization of the broad concepts, the survey instrument was designed to tease out some aspects concerning each attribute. The survey was delivered online. Anonymity was guaranteed.

The accompanying tables report these findings. An important caveat needs to be kept in mind when reviewing the results. Social science research has amply demonstrated that respondents typically exaggerate their skills in this form of investigation. For instance, when asked if their performance places them above average over eighty per cent are likely to respond affirmatively (Hallinan, 2009).

Work ready
Several questions posed centred on how students saw their degrees were preparing them for work. The results for the two programs are summarized in Table 1. The data for strongly agree and agree have been collapsed into a single agree category.²

The findings suggest that most students believe that their studies at RMIT are going meet the ‘work ready’ proposition contained the graduate attributes list. Students, furthermore, believe that the behavior of lecturers and the design of their degrees are positively directed to producing work ready graduates. There was, however, a discernable difference in the opinions between ideas expressed by undergraduates and postgraduates. The latter students were less positive about the

² Likewise, a single agreement scale has been used in the remaining tables produced in this section.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs work ready preparedness of their program. Part of the explanation for this differential most probably lies in that the undergraduates complete a cooperative education year. Their postgraduate counterparts do not have a comparable degree of WIL incorporated in their program.

The results suggest that the design of the M.Bus(IT) and the practice of lecturers need to examine how well this degree supports the work ready proposition inherent in RMIT’s graduate attributes.

<table>
<thead>
<tr>
<th>Table 1: Information systems student opinions about work readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. Our lecturers consistently remind us of the need to be well prepared to enter the workforce.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Q. Our lecturers take care to ensure that our assessment tasks contribute to us being ready for work.</td>
</tr>
<tr>
<td>Q. I feel confident that the design of my RMIT studies will see me prepared well to enter the workforce.</td>
</tr>
<tr>
<td>Q. My RMIT studies include sufficient work integrated learning that will allow me to make a positive contribution in the workplace.</td>
</tr>
</tbody>
</table>

N=100% (N=50) (N=99)

<table>
<thead>
<tr>
<th>Table 2: Information systems student opinions about active and lifelong learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. My RMIT studies make a point of ensuring that students become active learners.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Q. My RMIT studies regularly use a learning by doing approach to foster active learning.</td>
</tr>
<tr>
<td>Q. Generally, our lecturers seek to encourage students to develop independent learning skills.</td>
</tr>
<tr>
<td>Q. My RMIT studies are providing me with the tools needed to become a lifelong learner.</td>
</tr>
<tr>
<td>Q. The teaching in my RMIT studies places sufficient emphasis on having me acquire the skills needed to manage self-directed learning effectively.</td>
</tr>
<tr>
<td>Q. Upon graduation, I believe I will have sufficient skills to continue to manage my learning effectively.</td>
</tr>
<tr>
<td>Q. As a result of my RMIT studies I am improving my skills to manage my lifelong learning.</td>
</tr>
<tr>
<td>Q. My experience at RMIT is sparking an enduring interest in learning.</td>
</tr>
<tr>
<td>Q. Students in my RMIT studies are consistently encouraged to reflect on the effectiveness of their own learning process.</td>
</tr>
<tr>
<td>Q. My RMIT studies consistently require my use of inquiry-based learning to foster critical thinking and analytical skills.</td>
</tr>
</tbody>
</table>

N=100% (N=50) (N=99)
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Active and lifelong learning

Table 2 collects student opinions concern these two learning oriented graduate attributes.

The results indicate that IS students generally feel that they are acquiring sufficient skills to be able to manage lifelong learning beyond graduation. The findings do, however, provoke the thought that in these two programs more might be done to foster active learning. One more worrying result involves reflection about the effectiveness of learning. Only a bare majority of students agreed that sufficient encouragement was present to foster this form of reflection. The weakness of this response points to two areas of potential concern in these two degrees. First, the fostering of graduate attributes relies heavily on persistent and critical reflection. Secondly, to be well prepared to manage learning regardless of the time scale involved relies upon an ability to judge the effectiveness of current activities to promote sought after capabilities. If we are to set serious aspiration targets for RMIT graduate attributes we might also hope to see a more positive extent of response to the question involving the fostering of critical thinking.

If the teaching and learning processes employed in developing the nominated graduate attributes are important then it might be reasonable to accept that a substantial proportion of students would agree strongly with the presence of behaviors supportive of these attributes. In the case of IS students, only 14 per cent agreed strongly that the teaching in their RMIT studies placed sufficient emphasis on acquiring the skills needed to manage self-directed learning effectively. Only eight per cent strongly agreed that their RMIT studies consistently encouraged them to reflect on the effectiveness of their own learning process. These findings are suggestive of areas of learning and teaching practice that need significant further refinement.

Global orientation

Table 3 presents student responses to a range of questions that sought to operationalize student opinions concerning RMIT’s intent to become globally oriented university.

Table 3: Information systems student opinions about global orientation

<table>
<thead>
<tr>
<th>Question</th>
<th>BB(BIS) % SA + Agree</th>
<th>M.Bus(IT) % SA + Agree</th>
<th>School Average % SA + Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. My RMIT studies are preparing me well to deal with the challenges of globalization.</td>
<td>42</td>
<td>72</td>
<td>57</td>
</tr>
<tr>
<td>Q. Lecturers in my RMIT studies are sufficiently concerned to ensure that graduates are developing an appropriate global outlook.</td>
<td>48</td>
<td>71</td>
<td>60</td>
</tr>
<tr>
<td>Q. The competence standards being applied in my degree should ensure that its graduates are globally competitive.</td>
<td>63</td>
<td>70</td>
<td>67</td>
</tr>
<tr>
<td>Q. I could offer a clear explanation to my peers about the purpose of RMIT’s Global Passport strategy.</td>
<td>30</td>
<td>42</td>
<td>36</td>
</tr>
<tr>
<td>Q. I have a strong intention to practice my vocation outside of Australia at some point in the relatively near future.</td>
<td>47</td>
<td>55</td>
<td>51</td>
</tr>
</tbody>
</table>

Clearly, students in both degrees would struggle to explain what RMIT’s Global Passport strategy involved. This finding was unanticipated. The School has conducted by far RMIT’s most extensive offering of overseas study tours in the previous five years. Staff members had also won RMIT teaching awards and an ALTC citation for this work. Study overseas and work abroad had been
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs well publicized in the School. The finding probably points to the significant effort needed to have students more fully embrace the underlying philosophy of this particular graduate attribute.

There also was a discernable difference expressed by undergraduate students when it came to considering the matter of globalization and its challenges. Their RMIT studies apparently placed lower emphasis on this topic. As students in a business degree this result was a little surprising.

Cultural and social awareness

Table 4 presents results for set of questions that sought to tease out student opinions about this declared RMIT graduate attribute. The findings are suggestive that students believe there is room to enhance cultural awareness. Only 11 per cent strongly agreed that RMIT fostered sufficient intercultural understanding in its student body. In the case of undergraduate students only nine per cent responded strongly that their current degree was paying sufficient attention to helping the ability to manage cultural differences.

<table>
<thead>
<tr>
<th>Question</th>
<th>BB(BIS) % SA + Agree</th>
<th>M.Bus(IT) % SA + Agree</th>
<th>School Average % SA + Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. My student experience at RMIT is improving my cultural awareness.</td>
<td>69</td>
<td>85</td>
<td>77</td>
</tr>
<tr>
<td>Q. My RMIT degree is paying sufficient attention to helping me improve my ability to manage cultural differences.</td>
<td>52</td>
<td>68</td>
<td>60</td>
</tr>
<tr>
<td>Q. Currently, RMIT fosters sufficient intercultural understanding in its student body.</td>
<td>47</td>
<td>60</td>
<td>54</td>
</tr>
<tr>
<td>Q. There is insufficient time available in my degree to warrant spending time on improving cultural and social awareness of its graduates.</td>
<td>38</td>
<td>43</td>
<td>41</td>
</tr>
<tr>
<td>Q. There is scope in my RMIT studies to improve social awareness of students.</td>
<td>51</td>
<td>66</td>
<td>59</td>
</tr>
</tbody>
</table>

Innovative

A range of queries probed IS student beliefs concerning innovation and its treatment in their studies. These are presented in Table 5. A majority considered RMIT was improving their capacity to be innovative. Postgraduate students were more strongly of the opinion that more could be done for students with an innovative bent. In contrast, undergraduate students expressed stronger agreement about the capacity of their studies to foster the creation of new services and businesses. If, however, we apply the benchmark of the proportion of students who strongly agreed with a question directly related to the development of innovative capacities, the results are somewhat worrisome. Only four percent of undergraduates believed strongly that curriculum at RMIT offered sufficient opportunities to produce graduates who have an innovative bent. Only two per cent of postgraduates shared a similar degree of strong agreement. The pattern of responses about the availability of first hand experience with innovation and the related answers about the availability of suitable staff role models are supportive of these conclusions. Only 13 percent of undergraduates agreed strongly that staff offered appropriate role models about innovation. Five per cent of postgraduates expressed a similar level of strong agreement.

In these two degrees, the expression of student opinions about innovation in their studies suggest there are likely considerable challenges to be surmounted if this graduate attribute was to be strengthened.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Table 5: Information systems student opinions about innovation

<table>
<thead>
<tr>
<th>Question</th>
<th>BB(BIS) % SA + Agree</th>
<th>M.Bus(IT) % SA + Agree</th>
<th>School Average % SA + Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. My RMIT degree places sufficient attention on how to foster innovation.</td>
<td>52</td>
<td>54</td>
<td>53</td>
</tr>
<tr>
<td>Q. The processes used my RMIT studies offer first-hand experience of the challenges associated with becoming innovative.</td>
<td>43</td>
<td>45</td>
<td>44</td>
</tr>
<tr>
<td>Q. As a result of my studies at RMIT I will have increased my capacity to be innovative.</td>
<td>68</td>
<td>61</td>
<td>65</td>
</tr>
<tr>
<td>Q. Staff who take my degree offer appropriate role models when it comes to fostering innovation.</td>
<td>53</td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td>Q. I consider the study of innovation should attract only moderate attention when it comes to setting curriculum priorities.</td>
<td>47</td>
<td>41</td>
<td>44</td>
</tr>
<tr>
<td>Q. The curriculum at RMIT offers sufficient opportunities to produce graduates who have an innovative bent.</td>
<td>55</td>
<td>37</td>
<td>46</td>
</tr>
<tr>
<td>Q. My studies at RMIT offer sufficient scope to produce graduates capable of creating new businesses and services.</td>
<td>71</td>
<td>57</td>
<td>64</td>
</tr>
</tbody>
</table>

N=100% (N=50) (N=99)

Sustainability

Students were asked several questions about the attribute dealing with sustainability. Their responses offered in Table 6 suggest that students were less likely to deal with this issue in their RMIT degrees than with the other graduate attributes.

Table 6: Information systems student opinions about sustainability

<table>
<thead>
<tr>
<th>Question</th>
<th>BB(BIS) % SA + Agree</th>
<th>M.Bus(IT) % SA + Agree</th>
<th>School Average % SA + Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. My studies at RMIT offer sufficient scope about environmental sustainability.</td>
<td>28</td>
<td>46</td>
<td>37</td>
</tr>
<tr>
<td>Q. My RMIT studies are enhancing my understanding of environmental issues and my related responsibility.</td>
<td>40</td>
<td>53</td>
<td>47</td>
</tr>
</tbody>
</table>

N=100% (N=50) (N=99)

Undergraduates were more likely to report lower levels of agreement that sufficient attention was directed to sustainability issues. Nonetheless, there were very low levels of strong agreement in both degrees. Only four per cent of BB(BIS) students agreed strongly that their studies offered sufficient scope involving sustainability. The comparable response for M.Bus(IT) students was six per cent.

Other IS student opinions involving graduate attributes

The final section of the preliminary survey about graduate attributes included questions about how well students felt they were dealing with these outcomes. Table 7 presents the responses.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

With respect to generic graduate skills often valued by various stake-holding groups involved with higher education, students believed that they had improved their communication skills. A substantial majority agreed that their investigative skills had been enhanced. When scanning the results for possible areas of enhancement, it would appear that about a third of students reported there was scope to enhance how students traced their progress in developing the attributes. In the case of the M.Bus(IT) there also seems to be an opportunity to make a better connection between students monitoring their progress in fostering particular graduate attributes and preparing job applications.

Table 7: Information systems student opinions about graduate attributes

<table>
<thead>
<tr>
<th>Question</th>
<th>BB(BIS) % SA + Agree</th>
<th>M.Bus(IT) % SA + Agree</th>
<th>School Average % SA + Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. The processes employed in my RMIT studies prompt me to consider regularly the progress I am making in fostering the desired graduate attributes.</td>
<td>59</td>
<td>67</td>
<td>63</td>
</tr>
<tr>
<td>Q. My RMIT studies have allowed me to make a fruitful connection between the university's preferred graduate attributes and my preparation of job resumes.</td>
<td>72</td>
<td>49</td>
<td>61</td>
</tr>
<tr>
<td>Q. My RMIT studies have enhanced my ability to use reflective practice to foster my personal and professional development.</td>
<td>77</td>
<td>79</td>
<td>78</td>
</tr>
<tr>
<td>Q. My RMIT studies have improved my oral presentation skills.</td>
<td>81</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>Q. My RMIT studies have improved my written communication skills.</td>
<td>70</td>
<td>89</td>
<td>80</td>
</tr>
<tr>
<td>Q. My RMIT studies have improved my investigative skills.</td>
<td>86</td>
<td>92</td>
<td>89</td>
</tr>
<tr>
<td>Q. My RMIT studies have prepared me to respond more positively to the forces of change thrown up in the modern world.</td>
<td>74</td>
<td>86</td>
<td>80</td>
</tr>
<tr>
<td>N=100%</td>
<td>(N=50)</td>
<td>(N=99)</td>
<td></td>
</tr>
</tbody>
</table>

Summary
The results from the preliminary survey of IS students reveal that:

- Most students believe that their program has improved many of their generic skills.
- There are observable differences in the extent that students believe that particular RMIT graduate attributes were being realized. Certainly, there were variations of opinion apparent between postgraduate and undergraduate students.
- In several areas, students were able to identify where less progress had been achieved.
- Nonetheless, these student cohorts generally were unlikely to express strong agreement that their current study did much in the areas that RMIT had declared as priorities. The Project Team would argue that if real development was occurring in such attribute related learning and teaching students would have expressed high levels of strong agreement, preferably about the fifty per cent mark and certainly not below ten per cent.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

4. Mindset and graduate attributes

4.1 Introduction
Part of the effort to achieve strengthened graduate attributes as an outcome of an education at RMIT obviously involves the explicit and direct treatment of these attributes in the curriculum and its related assessment processes. Another part of the effort, centres on the creation of several generic skills that allow students to better self direct their professional development both while at university and beyond. In this latter category falls matters such a capacity for critical self-reflection. Such reflection needs to be coupled with understanding how to best facilitate learning. The critical capacity expected of graduates needs to be demonstrated by a healthy acceptance and demonstration of evidence based practice.

Nonetheless, concentration on these somewhat obvious matters that should be included in the learning and teaching practices of the university tends to miss an important starting point. The development of graduate attributes might usefully begin with a more student-centred focus. This starting point should explore students’ implicit theories about self. More particularly, the spotlight needs to be concentrated on what beliefs students have about innate abilities and the ability to transform ones self.

Ideally if the creation of a student’s portfolio is to foster reflection and associated generic attributes, the portfolio also needs to explore implicit theories about self and the capacity to learn.

Mindset
In the early months of the project, project leaders became aware of the work of Carol Deck and her theories involving mindset (Dweck, 2000; Dweck 2007). She proposes a dual theory of mindset. When people are asked about their beliefs concerning intelligence and character, she suggests that their responses can be characterized as falling into two broad categories. One represents a growth mindset. The other Dweck labels as a fixed set of mind. Each of these stances has particular behavioral consequences. Figure 7 summarizes these viewpoints.

The growth mindset is associated with the following thinking:
- Abilities are malleable
- Life is a journey of learning, therefore embrace uncertainty
- Seek new experiences
- Broaden repertoire of capability
- Detect new growth opportunities.

In contrast, Dweck suggests that those of us possessing a fixed turn of mind are more likely to:
- Believe abilities are immutable
- Consider life is a test and there seek to avoid looking foolish when challenge arises
- Be fearful of uncertainty
- Show an inclination to avoid new experiences
- Be inclined to master a narrower repertoire of behaviour
- Predisposed to overlook new growth opportunities. (Dweck, 2000; Dweck 2007).

Some recent research using brain scans has revealed another interesting finding involving mindset. When challenged with an assessment task subjects with a fixed mindset appear to pay less attention to the result of the experience. MRI scans revealed that fixed mind subjects were more likely to engage parts of the brain involved in emotional response. As a result, they appeared to be subsequently less capable of applying recent experience to a mastery of tasks than were their growth mindset counterparts. These findings offer additional neurological support for variations in learning potential because of the mindset that people implicitly accept (Mangels, et al, 2006)
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Figure 7 Summary of Dweck’s model of the dual character of mindset

Source (Dweck, 2007)
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

4.2 Relevance of Dweck’s theories to fostering graduate attributes
If we are seriously concerned to consider the development of graduate attributes it seems wise to first consider what the mindset orientations of our students are. Inherently, graduate attributes involve the idea of changing one’s self. Dweck’s research, however, prompts us to consider that a proportion of our students probably possess a fixed mindset. That being the case, such a mental orientation may pose a significant hurdle to be overcome if the desired levels of attribute development are to be accomplished. In the project, we therefore decided that we needed to commence at a more logical starting point. This step involved surveying M.Bus(IT) students to see if we could discern what the prevailing mental models were and how these might influence the development of RMIT’s nominated graduate attributes.

4.3 Graduate attributes mindset survey for M.Bus(IT) students in 2010
In semester one of 2010 all current M.Bus(IT) students in Melbourne and in Singapore were asked to complete the survey. Likewise, all commencing students in the second half of the year were invited to participate.

The survey posed students questions concerning intelligence and character that Dweck employs to discover a person’s mindset. Apart from these standard questions a series of similarly posed questions were developed for each of RMIT’s declared graduate attributes. The aim of these latter constructions was to see if patterns of fixed or growth orientation were attached to each attribute. Apart from the questions dealing with mindset M.Bus(IT) students also were queried about their self-perceived degree of competency for each graduate attribute. If we are to foster the development of graduate attributes further insight into the mind of the student is needed. The survey, therefore, asked to what extent a student was interested in further developing particular attributes. The ability to improve graduate attribute outcomes also is likely to be influenced by how students perceive what opportunities are available to nurture such attributes. Again, for each attribute, the survey incorporated questions about the perceived extent of conditions that would assist in the development of such capability. Appendix 4 presents a copy of this instrument.

The survey was delivered online. Initially in semester one, the survey capability contained in Blackboard was used to administer the survey. In semester two the delivery of the questions used a form created in PebblePad. The switch was made to increase the practice that students would have with the e-portfolio software.

In Melbourne for semester one, the 222 students enrolled achieved a response rate of 54 per cent. The rate of response there for the 67 commencing students in semester two was 57 percent.

In the instance of Melbourne-based students, Australian Fee Paying (AFP) students in semester one had a response rate of 64 per cent. In contrast, the participation rate for International Onshore (ION) students was 76 percent. In semester two the Melbourne response rate according to the status of a student was 60 per cent for AFP students and 48 per cent ION participants.

Mindset and intelligence
Dweck’s method of ascertaining a person’s mindset is to pose them a question concerning their views involving intelligence. The respondent is offered four statements. Two statements encapsulate deterministic beliefs about intelligence, i.e. this capability is largely predetermined and little can be done to alter it. The second pair of statements describes a more optimistic orientation where a respondent indicates that they have a reasonable degree of control concerning how their intelligence might develop. In the case of this instrument’s development an undecided alternative was added in case students, especially ION students, had difficulty expressing an opinion. The subsequent pattern of results indicated most students were able to offer definite opinions concerning various aspects of mindset.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Table 8 displays the findings involving the intelligence mindset question. The raw percentage column shows the initial percentages recorded for the question. The right hand data column reorders the results into indicative groupings of fixed and growth mindset.

The finding suggests that approximately a third of students in this degree may exhibit a tendency to a fixed set of mind. Dweck would suggest that such an orientation was an important hindrance if students are being prompted to expand their capabilities.

**Table 8: Intelligence mindset of M.Bus(IT) students**

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about the nature of intelligence. Choose the opinion that best matches your view.</th>
<th>Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your intelligence is something very basic about you that can't change much.</td>
<td>3</td>
<td>Fixed</td>
<td>Fixed</td>
</tr>
<tr>
<td>You can learn new things, but you can't really change how intelligent you are.</td>
<td>27</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>No matter how much intelligence you have, you can always change it quite a bit.</td>
<td>28</td>
<td>Growth</td>
<td>Growth</td>
</tr>
<tr>
<td>You can always substantially change how intelligent you are.</td>
<td>38</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(N=100 percent) Total 100 (n=199)

Further analysis was conducted to see if there were discernable differences in opinions about the development of intelligence between AFP and ION students. Note Table 9 does not include all student respondents. Only those in these two categories are incorporated.

**Table 9: Intelligence mindset of M.Bus(IT) students by origin**

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about the nature of intelligence. Choose the opinion that best matches your view.</th>
<th>AFP Raw %</th>
<th>ION Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your intelligence is something very basic about you that can't change much.</td>
<td>0</td>
<td>5</td>
<td>Fixed</td>
<td>AFP Fixed =35</td>
</tr>
<tr>
<td>You can learn new things, but you can't really change how intelligent you are.</td>
<td>35</td>
<td>29</td>
<td>Fixed</td>
<td>ION Fixed =34</td>
</tr>
<tr>
<td>No matter how much intelligence you have, you can always change it quite a bit.</td>
<td>33</td>
<td>28</td>
<td>Growth</td>
<td>AFP Growth =61</td>
</tr>
<tr>
<td>You can always substantially change how intelligent you are.</td>
<td>28</td>
<td>35</td>
<td>Growth</td>
<td>ION Growth =63</td>
</tr>
<tr>
<td>Undecided.</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(N=100 percent) Total 100 (n=40) 100 (n=97)
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

The results indicate that common views concerning mindset and intelligence exist regardless of the origin of the two major groups surveyed. In Melbourne the program is dealing with fixed views in about a third of candidates.

**Mindset and the nature of character**

Dweck’s consideration of mindset also includes a second query involving the nature of personal character. Again, respondents are asked to choose from four alternatives. Two are indicative of a fixed nature while the remaining two response categories offer a more optimistic account of how character might be altered.

M.Bus(IT) students appear more likely to believe that character has a fixed nature. Certainly, they appear to be less optimistic about being able to alter aspects about themselves. This view is apparent in Table 10. Twice as many students believe character to be a fixed entity than is the case with intelligence.

**Table 10: Character mindset of M.Bus(IT) students**

<table>
<thead>
<tr>
<th>Q: The next four statements describe various opinions about personality and character. Choose the option that best accords with your view.</th>
<th>Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are certain kind of person, and there is not much that can be done to really change that.</td>
<td>8</td>
<td>Fixed</td>
<td>Fixed = 62</td>
</tr>
<tr>
<td>You can do things differently, but the important parts of the person you are can’t really be changed.</td>
<td>54</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>No matter what kind of person you are, you can always substantially change important parts of your character and personality.</td>
<td>23</td>
<td>Growth</td>
<td>Growth = 36</td>
</tr>
<tr>
<td>You can always change basic things about the kind of person you are.</td>
<td>13</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>n=199</td>
<td></td>
</tr>
</tbody>
</table>

From the results in Table 11 it is evident that about one fifth more ION students are less optimistic about the ability to alter aspects of character and personality.

**Table 11: Character mindset of M.Bus(IT) students by origin**

<table>
<thead>
<tr>
<th>Q: The next four statements describe various opinions about personality and character. Choose the option that best accords with your view.</th>
<th>AFP Raw %</th>
<th>ION Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are certain kind of person, and there is not much that can be done to really change that.</td>
<td>3</td>
<td>13</td>
<td>Fixed</td>
<td>AFP Fixed = 46</td>
</tr>
<tr>
<td>You can do things differently, but the important parts of the person you are can’t really be changed.</td>
<td>43</td>
<td>54</td>
<td>Fixed</td>
<td>ION Fixed = 67</td>
</tr>
<tr>
<td>No matter what kind of person you are, you can always substantially change important parts of your character and personality.</td>
<td>33</td>
<td>22</td>
<td>Growth</td>
<td>AFP Growth = 53</td>
</tr>
<tr>
<td>You can always change basic things about the kind of person you are.</td>
<td>18</td>
<td>8</td>
<td>Growth</td>
<td>ION Growth = 30</td>
</tr>
<tr>
<td>Undecided.</td>
<td>5</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Mindset related to cultural awareness
Apart from exploring the mindset of students involving intelligence and character, the project team decided to apply the structure of Dweck’s questions to RMIT’s declared graduate attributes. The reasoning behind this step was to explore if students were more inclined to exhibit optimistic implicit beliefs about some attributes rather than others.

When this approach was applied the graduate attribute of cultural awareness the findings displayed that a quarter of respondents held a fixed opinion.

Table 12: Cultural awareness mindset of M.Bus(IT) students

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about ability to become culturally aware. Choose the opinion that best matches your views.</th>
<th>Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your cultural awareness something very basic about you that you can’t change very much.</td>
<td>4</td>
<td>Fixed</td>
<td>Fixed = 25</td>
</tr>
<tr>
<td>You can learn new things, but you can’t really change how culturally aware you are.</td>
<td>21</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>No matter how much cultural awareness you have, you can always change it quite a bit.</td>
<td>35</td>
<td>Growth</td>
<td>Growth = 71</td>
</tr>
<tr>
<td>You can always substantially change how culturally aware you are.</td>
<td>36</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N=100 percent) Total</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This result suggests that while there good prospects to enhance the cultural awareness of over two thirds of this student cohort there is still a substantial minority where effecting change in belief and competence may be more challenging. A breakdown of mindset involving cultural awareness for AFP and ION students also was made. The findings reported in Table 13.

Table 13: Cultural awareness mindset of M.Bus(IT) students by origin

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about ability to become culturally aware. Choose the opinion that best matches your views.</th>
<th>AFP Raw %</th>
<th>ION Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your cultural awareness something very basic about you that you can’t change very much.</td>
<td>0</td>
<td>7</td>
<td>Fixed</td>
<td>AFP Fixed = 5</td>
</tr>
<tr>
<td>You can learn new things, but you can’t really change how culturally aware you are.</td>
<td>5</td>
<td>28</td>
<td>Fixed</td>
<td>ION Fixed = 33</td>
</tr>
<tr>
<td>No matter how much cultural awareness you have, you can always change it quite a bit.</td>
<td>40</td>
<td>33</td>
<td>Growth</td>
<td>AFP Growth = 90</td>
</tr>
<tr>
<td>You can always substantially change how culturally aware you are.</td>
<td>50</td>
<td>27</td>
<td>Growth</td>
<td>ION Growth = 60</td>
</tr>
<tr>
<td>Undecided.</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N=100 percent) Total</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 13’s results suggest that ION students are possibly less optimistic what it comes to developing cultural awareness. Whereas 90 per cent of AFP students chose growth mindset options only 60 per cent of their ION M.Bus(IT) counterparts did so. While there may be a discernable difference between these two groups part of the explanation of the difference might stem from differences in comprehension about the questions posed. Setting this last point aside for a moment, the result does suggest some potential challenges. For example, one of the ways that cultural awareness might be fostered is to use the cultural diversity that exists in this student cohort as a resource. In doing so, however, lecturers need to be mindful that a substantial additional proportion of ION students may enter into such an exercise with somewhat pessimistic expectations about what might be achieved.

Innovation mindset

The aspiration to produce innovative RMIT graduates also prompts us to examine what implicit beliefs concerning innovation students currently hold. This graduate attribute was also caste into a Dweck-like framework to explore relevant mindset orientations. From the results reported in Table 14, it is apparent that more than a third of respondents expressed a fixed set of mind when assessing innovative capacity.

Table 14: Innovation mindset of M.Bus(IT) students

<table>
<thead>
<tr>
<th>Q. Choose the statement that best matches your views about innovative capacity.</th>
<th>Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your innovative capacity is some very basic about you that you can't change very much.</td>
<td>15</td>
<td>Fixed</td>
<td>Fixed = 36</td>
</tr>
<tr>
<td>You can learn new things, but you can't really change how innovative you are.</td>
<td>21</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>You can always substantially change how innovative you are.</td>
<td>29</td>
<td>Growth</td>
<td>Growth = 68</td>
</tr>
<tr>
<td>No matter how innovative you are, you can always change it quite a bit.</td>
<td>29</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=100 percent) Total</td>
<td>100</td>
<td>(n=197)</td>
<td></td>
</tr>
</tbody>
</table>

The responses for this attribute were broken down to see if there are differences between AFP and ION students. Overall, we see fewer students expressing growth responses when they were queried about the character of innovation than in many of the other attributes investigated. In the instance of innovation, we also see a larger proportion of undecided responses from students studying in Melbourne. The relevant findings for this attribute are reported in Table 15.

Table 15: Innovation mindset of M.Bus(IT) students by origin

<table>
<thead>
<tr>
<th>Q. Choose the statement that best matches your views about innovative capacity.</th>
<th>AFP Raw %</th>
<th>ION Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your innovative capacity is some very basic about you that you can't change very much.</td>
<td>18</td>
<td>18</td>
<td>Fixed</td>
<td>AFP Fixed = 33</td>
</tr>
</tbody>
</table>

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Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

You can learn new things, but you can't really change how innovative you are.

<table>
<thead>
<tr>
<th>Mindset</th>
<th>Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>ION</td>
<td>43</td>
<td>Fixed = 55</td>
</tr>
</tbody>
</table>

You can always substantially change how innovative you are.

<table>
<thead>
<tr>
<th>Mindset</th>
<th>Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>AFP</td>
<td>Growth = 53</td>
<td></td>
</tr>
</tbody>
</table>

No matter how innovative you are, you can always change it quite a bit.

<table>
<thead>
<tr>
<th>Mindset</th>
<th>Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth</td>
<td>43</td>
<td>22</td>
</tr>
<tr>
<td>ION</td>
<td>Growth = 55</td>
<td></td>
</tr>
</tbody>
</table>

Undecided.

<table>
<thead>
<tr>
<th>Mindset</th>
<th>Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
<td>3</td>
</tr>
</tbody>
</table>

(N=100 percent) Total

<table>
<thead>
<tr>
<th>Raw %</th>
<th>Mindset</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100</td>
<td>(n=40)</td>
</tr>
<tr>
<td>100</td>
<td>(n=97)</td>
<td></td>
</tr>
</tbody>
</table>

**Mindset involving environmental awareness and responsibility**

When asked about environmental awareness and responsibility a sizable majority of students appear to exhibit a growth mindset with respect to this attribute. Table 16 offers the relevant findings. When further analysis is done in Table 17 to show the results according to residency, it reveals that there is little difference between AFP and ION students. Of all the attributes investigated, environmental awareness is the one where most students appear to have a growth orientation.

**Table 16: Environmental awareness mindset of M.Bus(IT) Students**

Q. The next four statements describe various opinions about ability to become environmentally aware and responsible. Choose the opinion that best matches your views.

<table>
<thead>
<tr>
<th>Raw %</th>
<th>Mindset</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your environmental awareness and responsibility is something very basic about you that you cannot change very much.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Fixed</td>
<td>Fixed = 19</td>
</tr>
<tr>
<td>You can learn new things, but you can't really change how environmentally aware and responsible you are.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>No matter how much environmental awareness and responsibility you have, you can always change it quite a bit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Growth</td>
<td>Growth = 78</td>
</tr>
<tr>
<td>You can always substantially change how environmentally aware and responsible you are.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(N=100%) Total

<table>
<thead>
<tr>
<th>Raw %</th>
<th>Mindset</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>(n=197)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 17: Environmental awareness mindset of M.Bus(IT) students by origin**

Q. The next four statements describe various opinions about ability to become environmentally aware and responsible. Choose the opinion that best matches your views.

<table>
<thead>
<tr>
<th>Raw %</th>
<th>Mindset</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFP</td>
<td>3</td>
<td>8 Fixed = 11</td>
</tr>
<tr>
<td>ION</td>
<td>8</td>
<td>14 Fixed = 22</td>
</tr>
<tr>
<td>Your environmental awareness and responsibility is something very basic about you that you cannot change very much.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No matter how much environmental awareness and responsibility you have, you can always change it quite a bit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Growth</td>
<td>AFP Growth = 83</td>
</tr>
</tbody>
</table>

33
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

<table>
<thead>
<tr>
<th>You can always substantially change how environmentally aware and responsible you are.</th>
<th>45</th>
<th>33</th>
<th>Growth</th>
<th>ION Growth = 78</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undecided.</td>
<td>8</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N=100%) Total</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mindset and global orientation

Tables 18 and 19 display the student reactions to a question designed to explore opinions about the ease with which students believe that their global awareness might be altered. A substantial majority responded that such awareness could be enhanced. In the case of ION students, however, there was a noticeable minority who expressed a fixed orientation.

Table 18: Global awareness mindset of M.Bus(IT) students

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about ability to develop a global outlook on world affairs. Choose the opinion that best matches your views.</th>
<th>Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your ability to be aware of global affairs is something very basic about you that you can't change very much.</td>
<td>7</td>
<td>Fixed</td>
<td>Fixed 20</td>
</tr>
<tr>
<td>You can learn new things, but you can't really change how globally aware you are.</td>
<td>13</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>No matter how much global awareness you have, you can always change it quite a bit.</td>
<td>37</td>
<td>Growth</td>
<td>Growth 74</td>
</tr>
<tr>
<td>You can always substantially change how globally aware you are.</td>
<td>37</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N=100%) Total</td>
<td>100</td>
<td>(n=198)</td>
<td></td>
</tr>
</tbody>
</table>

Table 19: Global awareness mindset of M.Bus(IT) students by origin

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about ability to develop a global outlook on world affairs. Choose the opinion that best matches your views.</th>
<th>AFP Raw %</th>
<th>ION Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your ability to be aware of global affairs is something very basic about you that you can't change very much.</td>
<td>3</td>
<td>8</td>
<td>Fixed</td>
<td>AFP Fixed = 6</td>
</tr>
<tr>
<td>You can learn new things, but you can't really change how globally aware you are.</td>
<td>3</td>
<td>23</td>
<td>Fixed</td>
<td>ION Fixed = 26</td>
</tr>
<tr>
<td>No matter how much global awareness you have, you can always change it quite a bit.</td>
<td>43</td>
<td>34</td>
<td>Growth</td>
<td>AFP Growth = 77</td>
</tr>
<tr>
<td>You can always substantially change how globally aware you are.</td>
<td>48</td>
<td>32</td>
<td>Growth</td>
<td>ION Growth = 80</td>
</tr>
<tr>
<td>Undecided.</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

| (N=100%) Total | 100 (n=40) | 100 (n=97) |

**Mindset and life long learning**

In early 2010 the list of RMIT’s graduate attributes included both the ideas that graduates should be active learners as well as being practitioners of lifelong learning. The survey instrument was designed only to tease out views concerning the latter attribute.

In Table 20 it is clear that three quarters of respondents held growth mindset orientations about this graduate attribute.

**Table 20: Lifelong learning mindset of M.Bus(IT) students**

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about the ability to become a lifelong learner. Choose the option that best matches your views.</th>
<th>Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your ability to manage your lifelong learning is something very basic about you that you can't change.</td>
<td>5 Fixed</td>
<td>Fixed = 22</td>
<td></td>
</tr>
<tr>
<td>You can learn some new things, but you can't really change your ability effectively manage your lifelong learning.</td>
<td>17 Fixed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No matter how much ability you have to practice being a lifelong learner, you can always change it quite a bit.</td>
<td>27 Growth Growth = 72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You can always substantially change your ability to become a lifelong learner.</td>
<td>45 Growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100 n=198</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The findings displayed in Table 21 reveal that somewhat more ION students appeared to hold fixed mindset orientations involving the development of lifelong learning capabilities.

**Table 21: Lifelong mindset of M.Bus(IT) students by origin**

<table>
<thead>
<tr>
<th>Q. The next four statements describe various opinions about the ability to become a lifelong learner. Choose the option that best matches your views.</th>
<th>AFP Raw %</th>
<th>ION Raw %</th>
<th>Mindset Class</th>
<th>Provisional Mindset Class %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your ability to manage your lifelong learning is something very basic about you that you can't change.</td>
<td>2 Fixed</td>
<td>5 Fixed</td>
<td>AFP Fixed = 7</td>
<td></td>
</tr>
<tr>
<td>You can learn some new things, but you can't really change your ability effectively manage your lifelong learning.</td>
<td>5 Fixed</td>
<td>25 Fixed</td>
<td>ION Fixed = 30</td>
<td></td>
</tr>
<tr>
<td>No matter how much ability you have to practice being a lifelong learner, you can always change it quite a bit.</td>
<td>40 Growth</td>
<td>28 Growth</td>
<td>AFP Growth = 83</td>
<td></td>
</tr>
<tr>
<td>You can always substantially change your ability to become a lifelong learner.</td>
<td>43 Growth</td>
<td>37 Growth</td>
<td>ION Growth = 65</td>
<td></td>
</tr>
<tr>
<td>Undecided.</td>
<td>10 Growth</td>
<td>5 Growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N=100%) Total</td>
<td>100 (n=40)</td>
<td>100 (n=97)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

**Mindset and ability to manage**

Previously other researchers (Wood, et al, n.d) had explored the ramifications of mindset for performance by teams in management games. Teams composed of members who expressed fixed mindsets concerning whether or not the ability to manage was an innate capability performed poorly in comparison to teams composed of growth mind set believers. In the current project, the same question used in this prior research was also posed to M.Bus(IT) students. In this case, the question construction was simpler than standard format devised by Dweck.

The findings reported in Table 22 indicate that a substantial proportion of the respondents believed that ability to manage was something that you either did or did not have.

**Table 22: Management mindset of M.Bus(IT) students**

<table>
<thead>
<tr>
<th>Q. Do you believe that the ability to manage a group is a fixed capacity, something that you believe you either have or you do not have?</th>
<th>%</th>
<th>Mindset Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>58</td>
<td>Growth</td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>Fixed</td>
</tr>
<tr>
<td>(N=100%) Total</td>
<td>100</td>
<td>(n=198)</td>
</tr>
</tbody>
</table>

When AFP opinions are separated from those of ION students it apparent that substantially more overseas students expressed less optimistic views. In Table 23, it is apparent than more than twice as many ION students than AFP students selected the fixed mindset option. Such a difference is something to be kept in mind by lecturers who are seeking to cultivate managerial capabilities in the classroom.

**Table 23: Management mindset of M.Bus(IT) students by origin**

<table>
<thead>
<tr>
<th>Q. Do you believe that the ability to manage a group is a fixed capacity, something that you believe you either have or you do not have?</th>
<th>AFP %</th>
<th>ION %</th>
<th>Mindset Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>74</td>
<td>46</td>
<td>Growth</td>
</tr>
<tr>
<td>Yes</td>
<td>24</td>
<td>56</td>
<td>Fixed</td>
</tr>
<tr>
<td>(N=100%) Total</td>
<td>100</td>
<td>100</td>
<td>(n=40)</td>
</tr>
</tbody>
</table>

**4.4 Summary of M.Bus(IT) student mindset orientations**

The orientation of RMIT’s graduate attributes strategy is obviously to generate the development of these capabilities. Progress in this direction might be measured by the proportions of students who have strengthened their learning in each of the designated areas. The implicit beliefs that students have about the degree of control they might have over changing their competencies will doubtless have a bearing on what students achieve while studying at RMIT. For each the attributes examined the results suggest that a most students hold views that can be characterized as having a growth orientation. In the context of beliefs involving character and personality, however, a majority of respondents were less optimistic regarding the ability to alter behavior.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Of particular interest are the proportions of students expressing fixed mindset orientations. The expression of fixed orientations may suggest that it is going to be more challenging to initiate progress in these areas. Of course there is the possibility that expression of a fixed orientation in a survey does not later correlate well with the behavioral accomplishments subsequently achieved.

Table 24 summarizes the proportions of fixed mindset orientations for each of attributes investigated

Table 24: Summary of mindset orientations of M.Bus (IT) students

<table>
<thead>
<tr>
<th>Character and Personality</th>
<th>62%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to manage a group</td>
<td>42%</td>
</tr>
<tr>
<td>Innovativeness</td>
<td>36%</td>
</tr>
<tr>
<td>Intelligence</td>
<td>30%</td>
</tr>
<tr>
<td>Cultural Awareness</td>
<td>25%</td>
</tr>
<tr>
<td>Ability to become a life long learner</td>
<td>21%</td>
</tr>
<tr>
<td>Global outlook on World affairs</td>
<td>20%</td>
</tr>
<tr>
<td>Environmentally aware and responsible</td>
<td>19%</td>
</tr>
</tbody>
</table>

Much of Dweck’s work appears to draw heavily upon respondents’ perceptions involving intelligence to define mindset. If we accept this operationalization as a useful indicator, then about a third of M.Bus(IT) students are likely to be challenging cases. Several of the other RMIT graduate attributes appear to evoke a weaker fixed mindset. Overall, these results suggest that producing innovate graduates is more likely to be hampered by restrictive implicit theories about self. While ability to manage a group is not uppermost in the current descriptions of RMIT’s graduate attributes, it is important to note the degree of fixed mindset that may be involved with this capability. Fixed mindset perceptions in the minds of this student cohort appear to be most likely associated with a belief about the transformative potential associated with character and personality. One might argue that thoughts about these later attributes are clearly separated from the matter of graduate attributes. It is nonetheless; it is difficult to divorce issues of leadership and innovativeness from descriptions of character.

Several of RMIT’s graduate attributes are possibly more closely associated with the acquisition of factual knowledge. Cultural and environmental awareness along with a more global orientation are likely to fall into this category. In that respect, with these attributes may be easier to see greater degrees of overall advancement by the time that students graduate. The necessary degree of advancement in these areas might reasonably also vary depending upon the nature of the vocations that students are preparing for.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

4.5 Feedback of the mindset results to students

When students took the survey, there was no explicit mention of mindset and its ramifications. Once the results from the graduate attribute survey were processed, each respondent received feedback concerning the overall results.

The feedback came in the form of an animated PowerPoint presentation. This item was emailed to relevant students in October and November. The content consisted of the following items:

- Posing of the questions concerning intelligence, character and managerial ability that the students could answer
- Explanations about which responses indicated fixed or growth mindsets that would allow students classify their personal responses
- The pattern of overall response of M.Bus(IT) students to allow respondents to examine how their views compared with those of their peers
- Definitions of these mindsets and what are some of the potential ramifications that might stem from their acceptance
- Reference to further resources concerning mindset.

Unsolicited feedback from student recipients of this report in the form of email suggests that for some of them the material had been both interesting and thought provoking.

Further elaboration of the Dweck material

The examination of implicit theories pertaining to self using Dweck’s methodology leads to several other potentially interesting ramifications for the degrees participating in this pilot project.

4.6 “Brainology” or changing implicit theories about self

If we accept Dweck’s duality model of mindset, one obvious question that arises involves considering if those who hold a more self-limiting view be transformed into adopting more optimistic assumptions and practices concerning their personal development.

One of Dweck’s experiments offers some guidance (Dweck, 2007). High school students who were exposed to a two-hour “Brainology” course were able to improve their math scores compared to those students who had not received such instruction. Of particular interest is the apparent cost effectiveness of this intervention. For a very modest expenditure of effort in instruction, students were able to improve their performance or least to offset a traditionally expected fall in math performance.

The content of the Brainology course focused on revealing to students important information about the character of their brain function. This description was linked to the issue of learning potential. An analogy to building muscle in the gym was made. Students were advised of the premise that if sufficient work was done and this would lead to important improvements in competence. The tenor of the course obviously portrayed an optimistic set of mind. It was suggested to students adopting a growth model was beneficial to their educational outcomes.

Dweck and colleagues have subsequently created an online Brainology course for high school students and their parents (Mindset Works, Inc, n.d). The course encompasses much of the same material was described in the earlier intervention. In this case, however, more time is spent on exploring the nature of the brain, the relevance of such knowledge to effective learning, and the need to develop a growth mindset. In addition, Mindset Works’ Growth Mindset Learning Platform (GMLP) is noteworthy. Funded by the U.S. Department of Education Institute of Education Sciences, the GMLP will be an integrated online platform to support educators and students in developing and sustaining a growth mindset to boost student motivation and achievement. To date, there is no further extensive evidence available to assist us in making a judgment about the effectiveness of such an approach.
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The current work on GMLP, nonetheless, raises some possibilities that certainly are worthy of further investigation and experimentation. Why is this so? Well the data collected from M.Bus(IT) suggests that approximately one third embrace a fixed mindset orientation. Dweck’s research and that of others suggests that such an orientation is usually detrimental to students fully realizing their potential.

The evidence collected in the current LTIF pilot project also suggested that such a mindset possibly limits positive outcomes in several areas of graduate attributes. This especially appears to apply to matters involved with active and lifelong learning.

Exploration of such ‘brainology’ content logically should be positioned at the outset of study for a degree. Such positioning, however, can be problematic. A substantial portion of students typically skips orientation activities. Unless such material is assessed formally for credit, too many students have no strong incentive to work on their mindset related issues. Likewise, some academics will be skeptical about the use of a brainology approach. Like many students, such teachers also currently have little incentive to investigate the possible potential of ‘brainology’ to teaching in general let alone to the more specific matter of the fostering of graduate outcomes. As with many of the other aspects of portfolios and graduate attributes, too little attention has been paid by the university to identifying and administering an appropriate mix of incentives that will effectively influence the behavior of relevant stakeholders.

4.7 Character of feedback to students in the light of mindset

Dweck’s research offers one remaining implication for the realization of preferred graduate attributes. It relates to the character of feedback given to students. Dweck advocates praise being directed to the effort made by students (Dweck, 2007). She argues that praise that reinforces ideas about fixed implicit traits (like one is clever or bright) tends to produce counterproductive outcomes. Advancement in learning relies upon persistent effort in the face of trial and error experimentation. Dweck reasons that praise should be directed to those students who readily embrace trial and error learning. Moreover, positive reinforcement should be offered to those who persist when the learning tasks become more challenging.

In the LTIF project, the construction of feedback to students kept the above implication in mind. Commentary fed back to Brand You participants concentrated on offering positive remarks that acknowledged effort.

At this point, it is worth emphasizing there is an obvious connection to the work of other researchers and writers interested in the creation of talent. Talent is created largely by the amount of persistent effort invested. It is fostered by immediate and well-directed feedback. However, if credit points cannot be attached to the use of e-portfolios in a direct and meaningful way it is highly unlikely that optimum feedback practice will be applied to such learning endeavour.

The above discussion has implications for not only e-portfolios and the acquisition of desired graduate attributes. It is central to all learning endeavour in the university. Unless meaningful attention is concentrated on having lecturers examine the implications of mindset efforts to improve graduate attributes will remain modest at best.

4.8 Other current opinions held by M.Bus(IT) students about graduate attributes

The fostering of graduate attributes in a program sensibly needs to be based on some insight into how students currently view their situation. The collection of such market intelligence has the potential to identify possible impediments and reveal opportunities to program administrators and academics that teach into a program.

The project therefore sought to collect some such intelligence for each attribute using three broad headings. These included:

- A student’s rating of their current competence with respect to a graduate attribute
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

- The degree to which a student was currently interested in developing their capacity associated with an attribute
- The extent of opportunities currently available to develop a particular attribute.

Each of these matters was measured on six-point scales that included an undecided option.

Table 25 findings show that three areas of attribute development M.Bus(IT) students were likely to feel less confident about current capacity involved environmental awareness and responsibility, cultural awareness, and global orientation. Nonetheless, sizable proportions responded that they considered they had acquired a high level of competence.

Table 25: M.Bus(IT) students’ views about their competence with graduate attributes

<table>
<thead>
<tr>
<th>Q. How would you rate your current</th>
<th>Very High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Very Low</th>
<th>Undecided</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Capacity to sustain being a lifelong learner.</td>
<td>15</td>
<td>56</td>
<td>24</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>100 (n=196)</td>
</tr>
<tr>
<td>• Degree of cultural awareness.</td>
<td>10</td>
<td>47</td>
<td>37</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>100 (n=199)</td>
</tr>
<tr>
<td>• Ability to maintain a global outlook on world affairs.</td>
<td>9</td>
<td>39</td>
<td>39</td>
<td>10</td>
<td>1</td>
<td>3</td>
<td>100 (n=197)</td>
</tr>
<tr>
<td>• Capabilities involving environmental awareness and responsibility.</td>
<td>5</td>
<td>39</td>
<td>50</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>100 (n=202)</td>
</tr>
</tbody>
</table>

When asked about their current level of interest in developing graduate attributes, the findings displayed in Table 26 show that generally there was strong interest expressed in most areas. The most popular attributes involved cultural awareness and innovative capacity. Less interest was concentrated on environmental awareness and sustainability.

Table 26: M.Bus(IT) students’ current interest in developing their graduate attributes

<table>
<thead>
<tr>
<th>Q. My current interest in developing my innovative capacity would be best described as:</th>
<th>Very strong interest %</th>
<th>Strong interest %</th>
<th>Moderate interest %</th>
<th>Little interest %</th>
<th>No interest %</th>
<th>Undecided %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. How would you rate your current degree of interest in further developing your:</td>
<td>Very High %</td>
<td>High %</td>
<td>Moderate %</td>
<td>Low %</td>
<td>Very Low %</td>
<td>Undecided %</td>
<td>Total %</td>
</tr>
<tr>
<td>• cultural awareness.</td>
<td>19</td>
<td>58</td>
<td>20</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>100 (n=199)</td>
</tr>
</tbody>
</table>
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

<table>
<thead>
<tr>
<th>Graduate Attributes</th>
<th>Very High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Very Low</th>
<th>Undecided</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>• lifelong learning skills.</td>
<td>22</td>
<td>47</td>
<td>18</td>
<td>3</td>
<td>2</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(n=199)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• global outlook on world affairs.</td>
<td>24</td>
<td>40</td>
<td>28</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(n=196)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• environmental awareness and responsibility.</td>
<td>9</td>
<td>41</td>
<td>38</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(n=201)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When asked about how they perceived the current state of opportunities to develop particular graduate attributes, the results presented in Table 27 suggest that challenges exist in most areas for a sizable portion of respondents. In particular, opportunity appears to be less readily available in respect of the environment and innovation attributes.

Table 27: M.Bus(IT) students’ perceived opportunities to develop their graduate attributes

<table>
<thead>
<tr>
<th>Q. How would you assess the current opportunities available to further develop your abilities to:</th>
<th>Very High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Very Low</th>
<th>Undecided</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Manage lifelong learning.</td>
<td>18</td>
<td>48</td>
<td>28</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(n=198)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop a global outlook.</td>
<td>13</td>
<td>40</td>
<td>35</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(n=198)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop your cultural awareness.</td>
<td>8</td>
<td>43</td>
<td>37</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>n=199</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop your innovative capacities.</td>
<td>9</td>
<td>36</td>
<td>42</td>
<td>11</td>
<td>1</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(n=196)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop your environmental awareness and responsibility.</td>
<td>6</td>
<td>32</td>
<td>46</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>n=199</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M.Bus(IT) student opinion concerning allocation of resources to support graduate attributes

Another way of considering needs with respect to the fostering of graduate attributes is to consider how students believed RMIT should commit its resources to this objective. Their opinions are presented in Table 28.

Table 28: M.Bus(IT) students’ opinions concerning university allocation of resources to particular RMIT graduate attributes

<table>
<thead>
<tr>
<th>When the university allocates its resources what degree of importance should RMIT give to:</th>
<th>Very High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Very Low</th>
<th>Undecided</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fostering graduates who are active learners?</td>
<td>27</td>
<td>56</td>
<td>16</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(N=197)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fostering innovative capacity in its graduates?</td>
<td>31</td>
<td>51</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(N=199)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fostering readiness for work in its graduates?</td>
<td>34</td>
<td>47</td>
<td>16</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(N=197)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fostering graduates who are global in outlook and competence?</td>
<td>31</td>
<td>48</td>
<td>14</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(N=197)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

| • Fostering lifelong learning skills? | 29 | 47 | 20 | 2 | 1 | 1 | 100 (N=197) |
| • Fostering culturally aware graduates? | 20 | 55 | 22 | 1 | 1 | 1 | 100 (N=197) |
| • Fostering graduates who are environmentally aware and responsible? | 19 | 45 | 29 | 4 | 1 | 2 | 100 (N=197) |

Students generally want the university to foster the development of work readiness, global competence, and innovative capacity. Indeed, the results suggest students wish to acquire most of the attributes. Least enthusiasm, however, seemed to be directed to environmental awareness and responsibility.

4.9 Summary of findings from the attribute survey of M.Bus(IT) students
The findings indicate that:

- About a third of students appear to adopt a fixed set of mind that is likely to be detrimental to the development of graduate attributes.
- The respondents’ views varied as to the extent that they exhibited a fixed mindset orientation to RMIT’s priority graduate attributes.
- When reviewing the mindset orientations of students involving graduate attributes it was discovered that generally there appeared to be some important difference mindset orientations between those expressed by AFP students and those of their ION counterparts. In particular, some of this difference seems to involve varying beliefs concerning learning about how to manage.

When seeking to foster graduate attributes, the results revealed in this LTIF investigation indicate the complexities of belief that operate. In some instances, students believe that they have a reasonable degree of control over how they might foster capability when seeking to acquire an attribute. In the case of some other attributes, more self-limiting beliefs about what is possible seem to operate. To further complicate the picture, there are in some instances notable differences in the implicit beliefs held by AFP and ION students concerning attribute development. In addition, there exist some differences in beliefs about current competence, opportunity and interest between the attributes.

In the case of the M.Bus(IT), the findings are helpful. This degree is currently being refreshed prior to a professional accreditation process scheduled for later in 2011. The results are being considered as part of that current revision.

The mindset results drawn from this program obviously cannot be extended to the whole university. The survey, however, does point to the likely degree of complexity that will be present in most programs. Academics wishing to encourage further enhancement of RMIT’s graduate attributes are well advised to map what prevailing student views are in particular programs. The resulting findings then offer a better opportunity to nuance a program to better accommodate student beliefs and needs.
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5. Brand You

Introduction
A central project theme was to consider how the notion of RMIT’s graduate attributes might be combined with the availability of e-portfolio software to prepare the school’s students to deal more effectively with change.

5.1 Why should the school be especially interested in change?
Over the last fifty years advances in the application of information technology have been a major factor in economic and social development worldwide. Information systems practitioners therefore tend to be placed at the cutting edge of altered processes within institutions. Such placement generates a particular need to revise skills and to reflect upon the consequences of altered processes. This need is probably more acute than in many other vocations and occupations. The transformative character of RMIT’s graduate attributes is particularly relevant to the School’s graduates.

In a more general sense, placing greater emphasis on strengthening graduate attributes as a means of preparing students to deal with change seemed appropriate, especially given what appears to be happening with change itself. As discussed in a previous section research completed by Deloitte (2009) indicated that the rate of change in advanced economies appears to be accelerating.

In the face of such developments, it seems logical to consider if students’ generic skills can be enhanced so that they become more capable of renewing their skill base repeatedly after graduation.

5.2 Using “Brand You” to operationalize preparing for change.
Getting students to engage in processes that might strengthen generic skills for dealing with change effective poses a challenge.

In the current project, the investigators decided to explore using the idea of Brand You popularized by Tom Peters (Peters, 1999; Peters, 2004; Peters, 2004).

Peters suggests that we have much to gain from contemplating what our personal brand is. Consideration of brand calls into question what value is presented by our brand. This focus therefore examines what value we offer to anyone we deal with. Emphasis is placed on securing evidence to support our claims. Peters, additionally, asks what processes we use to strengthen our value proposition. Not content to stress the importance of continually enhancing our learning he also challenges us to contemplate how we are going to promote our personal brand (in other words ourselves) (Peters, 1999; Peters, 2004; Peters, 2004).

The typical list of questions that Peters poses in his Personal Brand Equity Test include the following items.

This test asks you to supply information under each of the following headings.

1. I am known for (2 or 3 items); next year at this time, I will be also known for [1 item]. i.e. can I point to two or three completed projects.

2. Can numerate, qualitatively and possible quantitatively, the benefits delivered to clients in each of those projects.

3. Able to provide references-names, addresses, email addresses, phone numbers, fax numbers-of living human beings called clients who will testify to the fact of doing good work during the past year.
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4. My current project is challenging me in the following ways [3 items]. Can explain (precisely) what I’ve learned that’s new and how it makes me more valuable on the labour market for my skill-set.

5. New things I’ve learned in the last 90 days include [2 or 3 items].

6. My public “recognition program” consists of [2 or 3 items]. In other words, how do others get to know about you?

7. Additions to my Rolodex in the last 90 days include [2 or 3 items] with an emphasis of new entries coming from outside of the firm.

8. Important relationships nurtured in the last 90 days.

9. My principal “resume enhancement activity” for the next 60-90 days is [1 item].

10. My resume is discernibly different from last year at this time in these [1 or 2] ways.

11. What are my braggables? [What can I confidently say about my achievements?]

5.3 Why the Brand You concept was attractive to us
We had several reasons for deciding why one of the elements that we would incorporate in our implementation of e-portfolios included “Brand You”.

Between 2004 and 2009, an exercise based on Brand You had been incorporated in several courses offered in the M.Bus(IT) both in Melbourne and Singapore. Summative evaluations of processes that students considered had been important in fostering their learning included examination of Brand You. Eighty-five percent of respondents had indicated that this process was an important fillip. In addition to survey data, some student comment in reflection diaries and personal comment directed to lecturers suggested that having them thinking about themselves as brand had strengthened their ideas about how to go about managing their personal development.

The frame of reference used in Brand You offers several potential advantages. Peters prompts us to review our brand propositions and the processes we use every ninety days. Such accountability, if practiced, has the advantage of continual reinforcement of reflective thinking which is important in personal development. This time frame transcends the usual pattern of semesters and years within a degree.

The content of what students might include in their brand statements is not confined to particular courses. The full range of opportunities from work and life in general can be drawn upon. Such focus offers a more realistic environment where generic capabilities might be practiced and developed.

The context of Brand You also has the advantage of its implicit focus on change. Practitioners are constantly being asked to expand to their skills. Additionally, they are being continually prompted to identify their use of processes that enhance their capabilities.
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The Brand You model has the virtue of being student-centred. From the outset, students are posed challenging questions about their capabilities. Hopefully, the emphasis placed on self would help keep their attention. The structure of the questions employed in the model offer clear connections to the development of content that might later be used when writing job applications. Experience suggests that too often students have paid scant attention to the creation of a persuasive CV until immediately before lodging a job application. Brand You has potential to have students consider what is happening with their professional development throughout their studies. Practice with Brand You additionally offers scope to have students continue serious consideration of their professional development well beyond graduation.

For the project a Brand You template was created for student use. The template included the range of questions that Peters has suggested we should pay attention to regularly. In addition to these questions, we added a series of queries that asked students to report on any recent experiences that were linked to the list of RMIT’s graduate attributes.

The first version was created in Microsoft Word. All relevant students were sent a copy as an email attachment. In addition, they could obtain a copy from a Program Gateway created in PebblePad. A further copy was available from a student’s program shell in Blackboard. Appendix 2 presents a copy of this first version. A Word template was used because we considered that most students would be familiar with this software. In the initial phase of getting students into embracing brand you we felt it was more important to get students responding to the questions and reflecting on their answers. Later in 2010, students were asked to load their response into PebblePad, and then share their file with a lecturer. Students were requested to publish their Brand You statement to a PebblePad Gateway. The gateway provided a confidential collection-point. In some instances students preferred to send their statement direct to the lecturer. Several students, who were having difficulty negotiating PebblePad, sent their statements as email attachments. The lecturer could then offer feedback about this initial Brand You submission using the feedback capabilities resident in PebblePad. Experience was to reveal that the use of the Word template produced an overly cumbersome routine.

After the first round of using the Brand You template in semester one the experience with its use prompted several revisions. These appear in version two. Many of the questions that formed part of Peters’ original list required improved contextual explanations. For instance, Peters’ questions use the concept of a project as the primary unit of work that a respondent might use to describe accomplishments. Whereas students with a reasonable amount of work experience have little difficulty in responding to this concept students with little/no employment history struggle to answer such questions. Version 2 therefore prompted students to consider the idea of project more liberally to organizational activities related to their wider life experience at school, in community activities and recreational pursuits.

Version 2 used the form function available in PebblePad. Students gained access to the Brand You template using the Create/New command. Once opened, the student automatically acquired this form as an asset. This asset in turn was published automatically in the appropriate collection gateway. This improved process removed some of the difficulties inherent in the first cycle of brand you statements collected in Semester 1 of 2010 in Melbourne and in Singapore.

To be effective Brand You requires students to consistently review their progress in the various sections of the statement. Version 3 of the form (see Appendix 3) redesigned the format to make it easier to compare progress from one report to the next. This reform requested that students present their reports in two columns. The right-hand column was to contain content from the earlier report. The left-hand column was to report the current status of a student’s professional development. Apart from making it easier for students to demonstrate what change had occurred the new format made it easier for a lecturer to perceive what development was being reported.

5.3 How Brand You was implemented in the project
Students in each of the target programs were briefed about how the Brand You should form part of their professional development portfolio.
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**M.Bus (IT) in Singapore (MC124)**

In January of 2010, students in this degree were introduced to the idea of an e-portfolio and the use of Brand You as part of that portfolio.

Previously, in this degree students had been asked to maintain a professional development portfolio (PDP). It had been kept on paper. In it, students were requested to report on aspects of their professional development several times annually. The focus of this exercise was to review their studies across their entire degree. In 2010, the idea of the PDP in MC124 was migrated to using PebblePad as the host for this exercise.

The student briefing reviewed the importance of the evidence that points to the accelerating rate of change in modern economies. Students were introduced to the recent statement of graduate attributes contained in RMIT’s existing Learning and Teaching Strategy. The briefing made a connection between the fostering of these attributes and creating a series of capabilities that would allow students to continually renew their employability in the face of perpetual change.

Briefing documents and resources concerning the rate of change, brand you and use of PebblePad were distributed to students. Additional copies were published in the MC124 Gateway in PebblePad and the program’s home base in Blackboard.

In semester one, MC124 students were asked to submit their first Brand You statement. At the time this request was made there were 23 students enrolled in the program. Students in this degree can enter the degree at 4-5 times in a year. Participants were therefore at various stages of advancement. Some were taking one of their early courses while some were about to complete their final course before graduation. All MC124 students study part-time and are employed full-time as information systems practitioners or more generally within the ICT industry.

Most students responded positively. The response rate was 74 per cent.

Several reminder messages were sent by email to students who were slow in submitting a statement.

Lecturers reviewed Brand You submissions. Comment and encouragement were forwarded to students using the feedback capability resident in PebblePad. Appendix 5 presents a sample of one of the forms used.

After this first cycle of Brand You submissions MC124 students were asked to submit a reflection diary statement about the process. Again PebblePad was used for this purpose.

Subsequently in 2010, MC124 students were asked to make several further Brand You submissions. These subsequent iterations used the revised versions of the Brand You template published in PebblePad. Feedback continued to be sent to students using PebblePad’s resources.

Overall the participation rate was modest. About half of the students availed themselves of the opportunity to use the Brand You process. As the PDP in this degree did not receive a separate grade there was no strong incentive to participate. Each time a statement was due several reminder prompts were sent to laggards concerning their failure to participate.

**BB(BIS) in Melbourne BP138**

In semester one of 2010, the further experience with Brand You in the BB(BIS) onshore exhibited a similar pattern. Initially, there were 164 commencements in BP138. A total of 87 Brand You statements were received from this cohort giving a response rate of 53 per cent. The commencement figure includes deferments and cancellations. Therefore, the response rate applying to serious semester one enrolments is closer to sixty per cent.

In subsequent cycles of submission the activity rate would decline despite using an extensive system of email prompts. Without the motivational pull of needing to make a timely submission in
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order to pass a course the staff overhead of following up late submissions or seeking to convert nonparticipants became considerable.

The experience with Brand You underlines an important finding. If an e-portfolio is to be used to foster serious reflective practice across a program for the duration of a student’s lifetime in that program then the participation must become a compulsory graded element of the degree. A majority of students, otherwise, will choose to ignore the process of reflective accountability. In a voluntary system the amount of effort expended by lecturers chasing up reluctant participants is too high. Such effort would be better directed to improving feedback to students concerning graded elements of their program.

Some students entered into the Brand Your process with considerable earnestness. Other respondents were less likely to exhibit a serious commitment.

The first round of Brand You statements only required participants to respond to Peters’ typical series of questions about what their brand stood for and what processes they were using to strengthen that brand. In the subsequent rounds, participants were asked to describe what recent experiences that might foster the further advancement of RMIT’s graduate attributes. While respondents could fairly easily account for developments in the first part of their subsequent statements, the reports concerning experiences directly related the graduate attribute facilitation were scarce.

**Brand You Implementation in M.Bus (IT) MC094**

In semester 2 of 2010, the notion of an e-portfolio and Brand You was introduced to commencing students in the onshore offering of this degree. In the interests of manageability, the introduction was restricted to the cohort of students who commenced their studies in this semester.

Again a series of orientation briefings were offered in Orientation Week and week one of the second semester. These briefings were supplemented by a series of hands on computer workshops in how to use RMIT student computing resources and more particularly PebblePad software. Students received invitations through conventional mail as well as through targeted email.

The briefings continued the theme of using Brand You as a means fostering capabilities to accommodate change and encouraging development of RMIT’s graduate capabilities. Approximately half of the relevant target audience participated in the briefings. In part late arriving ION students who made up over 75 per cent of the cohort frustrated attendance. A good proportion of these students did not arrive until late in week one of the semester. In addition, ease of meeting students and availability of rooms was somewhat frustrated by the major building remediation works underway in Building 108. To offset these limitations, further workshops were offered to students in later weeks of the semester but the uptake was poor.

The improved versions of the Brand You template were employed with this MC094 cohort. Participation rates were disappointing. Of the 67 candidates involved only 28 per cent lodged Brand You statements in the first round.

Again, an extensive series of email prompts were used seeking to engage students in the process. It soon became apparent, however, that the majority of students was going to ignore the requests because securing their degree did not require successful development of their Professional Development Portfolio. In the case of commencing ION students it became clear that many of them were also struggling to set up households and deal with assessable work. In such circumstances, there was little mental space or energy available to engage in a serious reflective exercise. Informal discussion with such students also revealed that their previous undergraduate studies usually had not contained any significant component of reflective practice geared to fostering professional development. As a consequence, they were somewhat at a loss about how to engage with the concept of a professional development portfolio.
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In hindsight an important weakness in the design of the project was the assumption that students would be able to initiate a considerable proportion of their portfolio using self directed learning. In the case of undergraduate students and most ION postgraduate students this idea proved to be faulty. During the project, it became increasingly clear that a more hands on method of teaching was required if students were going to be able to produce critical self-reflections likely to engender significant learning. Commitment of the required teaching resources to achieve such outcomes, however, is unlikely to be attached to voluntary type portfolios.

All students in the target cohort were again prompted at the end of semester 2 2010 to either lodge their first statement or provide their second submission. Once more an extensive series of email prompts were sent encouraging participation. Such prompts continued into January 2011. Again the overall response rates were disappointing.

In instances where M.Bus students did engage with Brand You there were some encouraging signs that the process was fruitful.

The students who appeared to gain from the Brand You exercise were the more motivated individuals. A crosscheck of semester two course results for several these individuals revealed that they were more likely to record higher course marks than were the nonparticipants in the Brand You exercise. The voluntary nature of the professional development portfolio therefore was less likely to impact on weaker performing students. It might be argued that the stronger performing students were likely to engage in necessary reflective practice and make progress their graduate attributes regardless of the existence of a development portfolio. The project’s findings are supportive of the proposition that voluntary development portfolios is not going to engage those students who most need to strengthen their reflective practice and graduate attributes.

A similar pattern of performance and participation was also identified in the cohort of BB(BIS) students who were involved in the project.
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6. Development of a skills profile dealing with a relevant core body of knowledge

6.1 Introduction
An attractive potentiality of using an e-portfolio at a program level is that it be employed to guide student learning and reflection for the entire duration of enrolment in a degree. One means of facilitating such processes is to have students plot their progress against a profile of the core body of knowledge (CBOK) that is encompassed by the degree they are taking.

Such skills maps can offer students a comprehensive view of what they need to accomplish across all years and semesters they are studying. If used wisely, skills profiles become a tool that helps integrate learning. Students are able check their progress against the maps. Accomplishments that can be incorporated into a student’s statement of progress can include: successful completion of formal coursework; skills mastered in WIL or in employment while a student; and other self-directed learning initiated by the student.

6.2 Initiating a skills profile into the curriculum of IS students
The effort needed to mount an e-portfolio across a degree needs to produce a tangible benefit beyond some of the common reasons advocates offer for the creation of such portfolios.

These latter reasons include creating a storage space for completed work undertaken in a degree and to show prospective employers the character of a students work. There are plenty of cheaper alternatives for providing a “shoe box” to store completed assignments. Such a function of itself does little to initiate further learning. As for the matter of being able to show potential employers a portfolio of work completed as a student, research now suggests in many vocations stakeholders involved in recruiting employees have little or no interest in consulting e-portfolios. In some instances in studio related arts, design, and architecture there may be some scope to create galleries of completed works. In the case of the information systems discipline the use of such galleries has very limited relevance. Technical reasons also would frustrate the playing and displaying of some systems projects inside e-portfolio delivery systems.

In the SBITAL, we determined that e-portfolios should be employed directly to enhancing learning and reflection. The use of the e-portfolio needed to allow us to explore potentials that previously were more difficult to accomplish before the availability of this software application.

As any experienced program (degree) director knows, one of the most difficult challenges to meet is to supervise learning across the degree. Degree structures by their very nature tend to compartmentalize subject material and skills. It becomes difficult for teachers and students to sustain a satisfactory overview of how all the components undertaken in particular courses fit together. In particular, there is the challenge of designing appropriate reinforcement loops to strengthen learning across the entire duration of a degree. Care needs to be taken to avoid unnecessary duplication of content while at the same time using sufficient repetition to build skills and capabilities effectively.

Most importantly, it is difficult to see what progress a student has made in their acquisition of skills and attributes that lie at the heart of a particular degree. Teachers only have a crude measure of student progress. This is available in the statement of marks and grades achieved. Such statements offer no real insight into the extent that students have sought to improve learning in particular areas. The results statements usually reveal nothing about the processes that students have employed to master a particular curriculum. Finally, in most instances a typical statement of results is going to reveal nothing about the development of generic skill development and little more particularly that is associated with the development of RMIT’s graduate attributes.

In contrast to the traditional statement of student results, judicious application of e-portfolios offers potential to provide richer information to teachers and students concerning the processes used to master appropriate skills.
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In the case of SBITAL, the LTIF project needed to create something more than the Brand You process if there was to be a strengthening of learning processes and particularly those associated with graduate attributes. The project team therefore decided to employ the Profiler function available in PebblePad to generate a skills map. Students seeking to trace their progress during their entire enrolment could then use this classification.

6.3 The Profiler function in PebblePad
One of the virtues of PebblePad is the availability of the Profiler. In the Profiler, teachers can create catalogs of skills that are associated with particular courses and more generally degrees. The skills and capabilities that go to make up a course of study are defined as a series of sets.

The resulting framework provides students with a map against which they can plot their learning. The Profiler offers several devices that facilitate this monitoring. Initially, students can offer a self-rating about their current degree of mastery for a set of skills. After this initial rating students are prompted to offer evidence about their claimed accomplishments. Figure 8 shows a sample of the MC124 program profile.

Figure 8 Sample of PebblePad profile

If students change self-rating involving accomplishments they can be prompted to provide evidence to support their claim for an improved rating. Where students currently have no evidence to substantiate their current claimed level of competency, PebblePad offers a facility that prompts them to create a learning plan that will produce supporting evidence. See Figure 9.

Sensible use of the Profiler potentially offers benefits beyond providing students with maps of the core bodies of knowledge associated with particular courses or degrees. The emphasis placed on a student having to offer evidence of accomplishment prompts students to start to take greater control over their learning. Indeed having students use profiles strengthens students’ experience of action learning. It can lead to enhanced ability to manage self-direct learning. The continual
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prompting of the need to create learning plans to progress development of particular skills reinforces such self-direction. These processes in turn can increase the potential of students to become life-long learners because of the Profiler’s continual prompting of foundational processes.

**Figure 9 Managing evidence in a PebblePad skills profile**

Having the students offer evidence of accomplishment presents them with a challenge. This challenge forces them to think more deeply about the character of their learning. In such circumstances they are more likely to think explicitly about how to trace learning cycles. If a program using profiles offers adopts a flexible approach to what it will accept as evidence of accomplishment students are potentially better placed to integrate a wider range of experience. Apart from formal assessments, WIL activities, as well relevant experience from employment or community development can be woven together to create a richer tapestry of learning achievements.

The Profiler’s focus on evidence offers another indirect benefit. Prompting students to document their evidence starts to create a foundation for them to become better proponents of evidence-based-practice (EBP). A worthwhile portfolio needs to be repository of effective reflective practice. This is impossible to achieve without sufficient attention being paid to the importance of evidence in assessment, accomplishment and decision-making. This potential evidentiary focus offers an important foundation upon which to build not only specific vocational skills but to enhance generic skill development more commonly associated with graduate attributes of the character captured in RMIT’s formulation of these.

**6.4 Creating skills profiles for IS students**

If e-portfolios are likely to offer improved learning potential then it seemed advisable to explore the use of the Profiler available in PebblePad. Use of the profile function offered the possibility that students and staff would need to exercise a greater degree of discipline in tracing the relevant learning that was occurring. Furthermore, use of profiles offered the prospect of being able to better manage learning processes of students over the entire time as an RMIT student.

To do this meant that a profile of relevant skills and capabilities needed to be constructed. One option was to confine the construction to one or several courses. Alternatively, a more audacious approach was to create a profile that covered the core body of professional knowledge for the three degrees featuring in this project. The latter option was selected. Its creation meant that any vocational course offered in each of the degrees investigated could draw upon this skills map.

The SBITAL drew upon several sources in this exercise.

The Australian Computer Society (ACS) accredits each of the degrees involved. During the life of this LTIF project the SBITAL began preparing for its next round of accreditation with the Society. This timing was fortuitous. The School was in the process of evaluating the extent to which its IS degrees were likely to meet current ACS thinking concerning the profile of skills that students should have mastered.

An integral part of this professional association’s accreditation process involves demonstrating the extent to which a degree covers the ACS’s Core Body of Knowledge (CBOK). This body of knowledge encompasses a range of topics in information systems and information technology. Schools seeking accreditation of their programs need to declare what the specific role their degrees seek to perform. In the light of such declarations schools then are expected to concentrate on covering pertinent content. Other issues incorporated in the ACS’s CBOK include covering ethical practice. Several of the elements described in RMIT’s graduate attributes also are included (Australian Computer Society, 2008). The ACS’s CBOK in turn has drawn heavily on research into model curricula completed overseas. More recently, the ACS has begun to revise its CBOK and accreditation processes to accommodate the classification of skills published in the Skills Framework for the Information Age (SFIA).
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The SFIA presents a comprehensive catalog of skills that encompass work in the ICT industry (SFIA Foundation, 2010). It has been created through a consultative process involving a range of relevant stakeholders drawn from professional societies, educational institutions, the ICT industry and government in Europe. SFIA seeks to provide a common terminology for work in the industry. In particular, it offers a comprehensive framework of skills that can be used as a tool in industrial relations and job design. SFIA envisages that the framework will become universally accepted as the open source framework for professional IT skills by all organizations that are involved in IT, whether they are users, service providers or professional bodies.

The comprehensive nature of SFIA makes it attractive to the ACS. The SFIA provides a more detailed account of skill descriptions with a better system of calibrating performance levels than that provided the ACS’s CBOK. In response, the ACS has begun to prompt IS schools to heed the existence of SFIA as they construct curricula. Schools, additionally, are advised to consider the SFIA as they prepare documentation to support their applications for ACS accreditation of their degrees. Graduates seeking professional membership in the ACS now have to demonstrate that their work at least satisfies Level 3 in the SFIA classification. The ACS also has begun including reference to relevant SFIA classifications in the presentation of its own professional development courseware. The increasing importance of SFIA in Australia is evidenced by the announcement that the public services in several jurisdictions and some companies have adopted SFIA in their preparation of job descriptions and accountability systems. SFIA has provided clarity around issues of competency skills in the IT industry, with the Commonwealth and some state governments undertaking adoption, as well as Westpac and Queensland Rail (Banks, 2010).

It is important to note that the SFIA does pretend to cover all areas of relevant knowledge. Rather its focus is on describing relevant skills that are typically performed during employment in ICT related matters.

Given the emerging importance of the SFIA, the Project Team decided to heeding SFIA nomenclature when constructing the SBITAL profiles that it aimed to use in PebblePad. The SFIA classification covers a wider scope of skills than that encompassed by the aims and objectives of either the BB(BIS) or the M.Bus(IT). These two IS degrees concentrate on business information systems. SFIA has the potential to describe paraprofessional and higher degree programs not only in business systems but also in computer science, computer engineering and more generally information technology. The development of the SBITAL CBOKS therefore extracted only those portions of the SFIA considered relevant to the aims and outcomes of the two degrees involved.

One profile was created for students with no prior formal higher education in business information systems. This classification was identified as the ‘neophyte’ profile. This profile was created to cover students enrolled in the BB(BIS). Students in this degree spend one third of their time studying general business courses. The remainder of their studies centres on vocational courses relevant to the creation and management of business information systems. The SBITAL neophyte profile was directed primarily at covering the range of vocational courses undertaken by IS students.

In the case of the M.Bus(IT), there are two points of student entry. One group of entrants has no prior formal higher education in business information systems. This group therefore shares much in common with BB(BIS) students. The neophyte profile therefore was deemed relevant to offering a framework that could be used to describe their learning experiences as well. In the M.Bus(IT), however, there is a second group of entrants. These students already have completed a relevant undergraduate degree in information technology. These candidates therefore complete a range more advanced courses. To accommodate this second group an ‘advanced’ profile was developed. It included more of the higher level management skills appearing in the SFIA while dropping some of the lower level entry skills appearing in the ‘neophyte profile. This latter profile sought to cover advanced entry candidates in Melbourne and M.Bus(IT) students studying in Singapore. The offshore offering of the M.Bus(IT) includes only the advanced cohort.
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When adapting the SFIA to create these SBITAL profiles several adjustments were made. The SFIA classification incorporates a definition of a skill area. It then lists several aspects of a particular skill set. This practice leads to the creation of a fair degree of redundancy. The LTIF project team therefore edited the SFIA to reduce redundant text. Otherwise, without such adjustment, the profile specifications would have become overly large without gaining any benefit. The SFIA definitions were retained but the skill descriptions were shortened where this was possible without destroying their essential meaning.

The SFIA contains no direct description of ethical behavior expected of IS professionals. For skills relevant in this area the construction of the SBITAL profiles drew from the ACS’s CBOK. A resulting set was incorporated both into the ‘neophyte’ and advanced profiles created in PebblePad.

The final source of content incorporated material from RMIT’s modified statement for desired university graduate attributes. At the commencement of the project, the LTIF team only had seven words or phrases that described the attributes in question. The early work in the project was hampered to some extent because there was insufficient definition available about each attribute. This lack of detail made it difficult to offer students consistent definitions about what the attributes actually meant.

In the latter part of 2010, the university published a revised statement of the RMIT graduate attributes in the university’s website. The original seven attributes were reduced to six. This reduction was achieved by combining active learning and lifelong learning into one attribute. More importantly, the revised statement offered teachers and students descriptions that detailed appropriate ways in which individuals might explore each attribute (RMIT, 2010).

The construction of the two SBITAL CBOK profiles incorporated these detailed graduate attribute descriptions. Previously, the Brand You statement forms had included a section on the attributes. Its purpose was to prompt students to describe what, if any, relevant activities that they had undertaken in these areas. Students, however, when submitting Brand You updates typically offered little or nothing about learning and accomplishments under the graduate attribute headings. The infrequency of relevant reporting about attribute development is not surprising. A variety of reasons possibly account for this low response. First 2010 was really the first year that any mention of the attribute list was made in the SBITAL. The brevity of the initial list of attributes published by RMIT made it difficult for teachers and students to reach some constructive understanding of what each graduate attribute might actually involve. Much of the time there was not explicit connection made in the teaching and assessment tasks between the traditional IS curriculum and the statement of graduate attributes in the two degrees involved. Formulating self-directed learning projects centered on the attributes without a more comprehensive statement of what each attribute involved appears to have been beyond the reach of most students. Fixing the expanded attribute definitions into the context of SBITAL CBOK profiles would seem to present a more helpful environment. Apart from the better definitions, the Profiler’s inbuilt functions that support reflection and creation of learning plans offer a more fruitful environment for reporting learning involving graduate attributes.

A final source of influence in the creation of the SBITAL’s CBOK profiles was the Seoul Accord. This accord is a multi-lateral mutual-recognition agreement among agencies responsible for accreditation or recognition of tertiary-level computing and IT-related qualification (Seoul Accord, n.d). The ACS is a signatory to this accord. It forms an emerging standard that can be used to make it easier for the transnational movement of ICT employees from one jurisdiction to another because professional qualifications will be recognized by each signatory. The Accord shares much in common with the ACS’s CBOK, the SFIA, and many aspects of RMIT’s graduate attributes. The SBITAL’s catalog of skills therefore needed to mindful and be basically consistent with the direction that the accord is taking.
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6.5 Challenges in using a PebblePad profile at program level

The resulting profiles are large. Each runs to more than 50 skill sets. A sample is appended. If care is not taken to introduce students carefully to the concept of using profiles then their size could be potentially overwhelming.

One means of securing the profile in a program’s curriculum is to ensure that its course guides explicitly mention which aspects of the relevant SBITAL CBOK are to feature in a particular delivery of a course. When such connection is made it becomes easier for students to relate the content and processes of a course to their monitoring of learning in the PebblePad Profiler. Completion of relevant course assessment tasks can then form part of the evidence they present to justify their self-ratings in the SBITAL CBOK.

Apart from demonstrating the relevance of the CBOK skills maps to their studies, there remains the problem of ensuring that students are going to take the mapping and reporting seriously. Experience in this LTIF project has demonstrated unreservedly that unless the students’ work with graduate attributes is assessed and that such assessment has a bearing on whether or not they are eligible to graduate, use of the profile and attribute development is likely to be ignored by all but some of the more conscientious and better performing students. Once again, the significant learning potential of a degree level portfolio therefore is lost.

The use of the profile and the effective development of graduate attributes require students to become proficient at designing effective circles of learning. At the centre of such circles of learning students need to master a high degree of critical reflection. Such mastery is demanding. It is likely to stretch students. It is something that is not easily dashed off at the last moment. Effective use of the profile also requires diligent monitoring and reporting. Given such demands many students are likely to take the path of least resistance and decline to participate unless grades are involved. The use of an e-portfolio as voluntary self-development exercise is frankly overly expensive in terms of staff effort. Too much staff attention becomes directed to seeking student participation. Too many students simply ignore invitations to participate.

A further constraint in the implementation of a skills profile approach to e-portfolios involves the behavior and attitudes of some teachers. Effective use of the profile requires adjustment in assessment schedules and time to be spent considering the overall direction of learning outcomes produced in a degree. Apart from the usual degree of reticence evoked by any change process, an increasing proportion of academics in the SBITAL are becoming disinclined to engage in serious effort to enhance learning and teaching processes. They believe that their job security and most certainly their chances of promotion are better served by directing their attention to research. In particular, they are exhorted to seek publication in journals. An implicit belief is, whether well founded or not, that scholarship in learning and teaching counts for the less. In such a climate, it becomes difficult to initiate education experimentation and reform.

6.6 Making the e-portfolio an assessable component

Students are not going to take the use of e-portfolios seriously unless work undertaken in them counts.

In a single course it is a relatively simple matter to nominate the presentation of work in a portfolio to be part or all of the assessable tasks. In the case of using the portfolio to track learning for the entire duration of a student’s enrolment is considerably more difficult. In recent years, RMIT has moved to a program design where a full time student typically completes four courses each worth 12 credit points. RMIT policy now dictates that the smallest unit permissible should attract 12 credit points. It is generally impractical to allocate one of these courses to cover portfolio work each semester. Such an allocation ends up devoting too many credit points to the program portfolio. RMIT has moved largely to this $4 \times 12 = 48$ system in the interests of administrative efficiency. The move, however, makes it more difficult to allocate credit points to a portfolio that seeks to map student progress at a program level. An alternative arrangement of credit point allocations supportive of portfolio development might consist of a full-time student’s semester load consisting of four courses each worth 10 credit points and eight points being allocated to the portfolio.
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The increased rigidity of credit point allocation to program course components makes it somewhat more difficult to ensure that particular types of student portfolio receive sufficient credit points to motivate. If RMIT is going to be serious in its use of student portfolios it needs to revisit its current policy regarding the minimum allocation of credit points to a course component.

6.7 Implementation of the SBITAL CBOK profile in the M.Bus(IT)

In the latter half of 2010, the SBITAL has been preparing for the accreditation of its IS degrees by the ACS. Part of this preparation involved checking the School’s courseware against the content specifications of the ACS’s CBOK and that of the SFIA. Those analyses created the groundwork for developing the SBITAL’s own classification of skills to be included its PebblePad program profiles.

Part of the preparation for ACS accreditation has required important revision of the program structure of the M.Bus(IT). Previously the accreditation criteria required at least eight of the 12 courses in this degree to be directly relevant to the content of the ACS’s CBOK. A revision of the ACS criteria in 2010 now requests that all twelve courses must cover the CBOK. This change affords an important opportunity to restructure the degree so that an e-portfolio becomes an integral part of the degree. Most importantly, the structuring makes it easier to ensure that the students’ portfolio becomes an assessable component. Students will be unable to graduate until a satisfactory attempt has been made by students to chronicle their learning achievements with sufficient attention being paid to critical reflection and the production of evidence in their profile.

The linkages between the e-portfolio and the remainder of the degree will be made at several points. Part of the assessment in a course on investigations in the first semester will require students to make their initial ratings of skills contained in either the neophyte or advanced M.Bus profile. Part of that assessment task calls for critical reflection writing about progress with the management of their learning using the profile. In the second semester, a course dealing with professional practice will again require monitoring of learning progress mapped in the profile. Finally, in semester three the final project, which is of a capstone nature, will necessitate submission of a final profile statement detailing the progress of a student’s learning.

Apart from these formal connection points several other measures are to be used to secure the use of the profile more directly in the M.Bus(IT) courseware. Course guides are being revised to indicate which aspects of the profile feature prominently in a particular course. This practice, hopefully, will increase the probability that the profiles’ skills maps and in particular RMIT’s graduate attributes become more ‘top of mind’ matters in the degree’s learning and teaching processes. In several other courses that use reflection diaries as a part of formal assessment students will be able to connect such diaries to their degree profiles. Accomplishments in other courses can also feature as evidence for any part of the profile.

In each of the three formal assessment linkage points students have to demonstrate what progress they have made. To aid this process a spreadsheet has been designed to make the mapping signs of advancement of learning easier to report. See Figure 10. This report shows the extent to which the self-rating of skills has altered during a semester. The report identifies which student nominated skill changes are supported by evidence statements. Finally, the students need to have identified which skills have received priority attention for semester in question. Targeted progress concerned with RMIT’s graduate attributes can be stimulated by requesting that at least two of the priority skills nominated for priority attention are drawn from the graduate attributes of the M.Bus(IT) program profiles.

The spreadsheet has been created because PebblePad’s Profiler application does not have a readymade capability to offer a bird’s eye view of the changes that have occurred in a student’s profile. The spreadsheet’s functionality makes it easier to sort changes in skills. A teacher can then see which skills in the profile have been nominated as priority areas of learning. It becomes easier to see in total what changes in self-ratings have occurred and the production of evidence associated with these priorities. From that report an assessor can then go to the various nominated skills in the profile to examine the documentation of the changes in detail.
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An end of semester profile report lodged by students would consist of the following components:
- Their M.Bus(IT) CBOK profile in PebblePad with its ratings and associated evidence.
- The spreadsheet report that provides a clear summary of what changes have occurred in the profile.
- Submission of a critical reflection report concerning their experience in managing their skills profile. This report can include commentary about what has changed in their Brand You report in the relevant semester.

Figure 11 displays a flow process chart given to students. The chart summarizes what steps they need to take to initiate use of the skills profile in their degree.

**Figure 10 Monitoring learning in the CBOK profile.**

**Assessing the portfolio**

There are two broad options when it comes to considering what assessment regime should apply to the portfolio. One is to grade the submissions with the option of awarding grades higher than a pass. The second option is consider using a threshold approach or hurdle requirement.

If the hurdle approach is used then it is relatively easy to set some thresholds that a student must satisfy in a particular time span. For example in the case of the M.Bus(IT) profile, the following thresholds might be used:
- For a semester a student must nominate at least eight skill sets from the program profile as learning priorities, two of these must include sets drawn from the RMIT graduate attribute and ethics sets.
- For each nominated priority, a student must provide evidence that sufficient learning experiences have been undertaken to support any claims that the student makes with respect to positive changes in self-reported ratings in the program profile.
- For each priority set nominated, the evidence provided must include one or several critical reflections concerning the passage of the learning that occurred.
- Furthermore, the evidence offered needs to include a statement of the learning cycle used by the student to seek improved learning outcomes. This statement could follow Kolb’s learning cycle (Kolb, 1984) or some similar reflective process model of the student’s choosing.
- To increase the potential integrity of the reflections and the learning cycles such documentation would need to have received a satisfactory ‘bill of health’ from Turnitin. Otherwise, the writing of such documentation would be too open to plagiarism.
- If students failed to meet the above requirements, they could be asked to resubmit their reports until a satisfactory submission was lodged.

These requirements would increase the probability that students engaged in sufficient iterations to create a better understanding of critical reflection and how to more effectively take charge their learning. These processes would in turn offer a better foundation for realizing the university’s aspirations involving graduate attributes.
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**Figure 11** Overview of CBOK profile management

**Starting Your MC124 CBOK Profile for the PDP**

1. **From Blackboard:** Download Powerpoint file that introduces the MC124 CBOK profile.
2. **Make your copy and read the file.**
3. **Download the MC124 Profile Tracking Spreadsheet from Blackboard.**
4. **Make your copy, inspect the tracking spreadsheet.**
5. **Launch PebblePad. Use Create New Profile command to create your copy of the MC124 profile. It becomes your asset.**
6. **Initiate, rate your current skill development for each skill category using a 3-point scale.**
7. **In the tracking spreadsheet, record what your initial ratings are. Also identify 7-9 skill sets that are going to be your primary focus.**
8. **Submit your initial tracking spreadsheet in MC124 Profile Tracking Gateway via PebblePad.**
9. **Convene recording the progress of professional development in your PebblePad profile. Do so by editing this asset.**
10. **Use the tracking spreadsheet to record changes in ratings and evidence in preparation for read regular report.**

**Mentors**
This LTIF project used a range of communication channels to inform students about relevant processes. Initial face-to-face lectures and laboratory sessions were offered. Publication of relevant guides and lectures were published in BlackBoard and in PebblePad gateways. Extensive use was made of email to remind students about project processes and submission dates. The feedback to students harnessed the reporting features available in PebblePad. Underlying the idea
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of using this mix of channels was to see if economies of scale might be achieved by concentrating on use of electronic messaging.

Despite the considerable effort to initiate electronic engagement with students, it became apparent that use of these channels is not sufficient of itself to have students engage successfully with the idea of a portfolio. A more structured process of face-to-face contact seems to be called for. The plans therefore to initiate the SBITAL CBOK in the M.Bus(IT) during 2011 intend using a mentoring system. This system will consist of groups of 7-8 students meeting several times each semester with an academic mentor to review issues concerning the development of their portfolios. Such opportunities can be used to resolve queries about technology and pedagogic matters involving critical reflection and the development and documentation of learning cycles.

6.8 Facilitating student mastery of PebblePad

A challenge in implementing e-portfolios centres on the effort needed to get students to develop a satisfactory level of mastery in using PebblePad software.

Such mastery is largely a product of sufficient use. If students, however, only need to engage with the software several times in a semester there is a problem. Their infrequent use generally does not develop a level of skill that promotes confidence in using this e-portfolio system.

For the purposes of developing and managing e-portfolios PebblePad offers several advantages over the Blackboard implementation at RMIT. PebblePad’s Profiler application provides an appropriately constructed capacity to map important skills in courses and programs. It is purposively designed to cater for student creation of learning plans and documentation of their achievement. PebblePad has strengths in facilitating feedback and commentary to its users. Importantly, a student’s profile can be maintained easily over the full period of enrolment in study for a degree.

Nonetheless, in many respects use of PebblePad is in direct competition with the emerging functionality being released in recent revisions of BlackBoard. The latter learning management system (LMS) now offers a wide range of student publication options including journals and wikis. Most importantly across RMIT increasing use of BlackBoard centres on utilization of its Grade Centre. Lecturers therefore are increasingly likely to have students complete most if not all their work in the LMS. Such concentration makes it easier to record grades and upload final results into the university’s databases. In these circumstances, students are going to always receive more experience of BlackBoard than they will with PebblePad.

During the project, some student feedback involved complaints about the use of too many systems in RMIT. Some aspects of the PebblePad interface are not particularly intuitive. In the SBITAL, it is reasonable to expect that neophyte students studying information systems should have little trouble in driving their use of PebblePad. This assumption proved not to be the case. For example, the use of PebblePad requires an understanding that the system is managing a series of assets. These assets can be shared in a range of ways. Initially, students seek to drive file attachments as if PebblePad was primarily an email system, which it is not.

Given this range of available functionality between different LMSs, some care has to be given to the use of a mix of software to employ in an e-portfolio at RMIT. If PebblePad is to be used it seems to be superior if lecturers want to capitalize on the functionality offered by the Profiler function. Use of PebblePad is more supportive of portfolios that are going to run for the life of a student’s enrolment in a program. There, nonetheless, remains the challenge of having students use PebblePad frequently enough to generate sufficient competence thus engendering sufficient confidence in the system.

To date, in the use of PebblePad in the M.Bus(IT) a trade off has been made. In several courses, PebblePad has been used to have students submit learning plans for projects as well as assessable reflection diaries. In some respects, such submissions would be better handled in the BlackBoard course shells that support these subjects. Nonetheless, a strategic decision has been
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs to shift some of this student work to involve using PebblePad. Its intent has been to produce sufficient use of PebblePad to support necessary skills development. Such development then makes it easier to use PebblePad to create and develop the two major components of their e-portfolio in the M.Bus(IT). These components are the cycle of Brand You reports and the students’ mapping of their learning using the profiles that encompass the M.Bus(IT) CBOKs.
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7. Resource support for graduate attribute development

7.1 Introduction
In the initial application of LTIF funding one of the minor objectives listed was the hope that the project would yield examples where students demonstrated their experience in mastering the graduate attributes. It was anticipated that such examples drawn from the pilot activity associated with the SBITAL’s degrees could be shared with other RMIT students.

During semester one of 2010, the reality of student behavior soon demonstrated that this initial aspiration was overly optimistic. It became apparent that both postgraduate and undergraduate students struggled to offer accounts of how their recent learning had involved notable relevant events. In the Brand You process students were asked recount what recent learning had engaged the students to delve into explorations of RMIT’s graduate attributes. Most students seem to struggle to offer such accounts. To the extent that they could, the reflections they offered most typically recalled learning associated with the work ready attribute.

These student accounts of their learning possibly point to the fact that few students view such learning through the lens of graduate attributes. Where relevant formal learning connected to particular courses is evident students appear not to be able to readily connect such material to the classification of graduate attributes.

For example, study of ‘green’ information technology is demonstrably connected to the attribute dealing with environmental sustainability. Often students, however, do not readily connect that specific learning to the more general classification of the graduate attributes. This lack of connection is unsurprising. Most lecturers in the SBITAL appear not to have emphasized the mastering the set of graduate attributes in their teaching. Informal conversation with colleagues soon demonstrated that a sizable portion of colleagues were unable to enumerate what the list of RMIT’s graduate attributes covered. Outside of indicating the need to produce work ready graduates many academics struggled to describe the other attributes. Inspection of current course guides also revealed that little if any mention is made specifically about acquiring of RMIT’s graduate attributes. In this context, graduate attributes appeared not to be a top of mind issue for either lecturers or their students.

Understandably the curriculum focus of many lecturers is centred on having students master specific vocational skills. In contrast, the orientation of the graduate attributes list centres on the development of more generic capabilities. Recent Australian research into how confident and capable academics feel about the enhancement of generic student capabilities suggests a sizable proportion were more likely to be confident about the fostering and assessing the more traditional virtues of critical thinking and associated written expression. Less confidence and or interest appears to have been connected to graduate attributes falling outside more immediate and narrow discipline interest. Work by de la Harpe (2010), which included RMIT respondents, makes this distinction clear.

The above developments suggested to the project team that to foster graduate attributes to a higher level in the SBIT was going to require some further capacity building. Given the time scale of the project, which had the short-term time horizon of a year, such capacity building was difficult. Instead of trying to create a repository of excellent student examples where students displayed mastery of attribute related accomplish, a step back was needed.

Work by de la Harpe et al (2010) suggests that promotion of graduate attributes valued by employers is not necessarily fostered by academics. From the point of self-interest there often appears to be little incentive for lecturers to depart from their narrower discipline interests. The greater probability for research rather than teaching excellence to be rewarded with promotion hinders development of graduate attributes.
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Even where there are academic proponents of graduate attributes, it is reasonable to infer that lecturers need some assistance to be able to readily locate resources that might allow them to infuse their courses with increased content and examples more directly connected to the attribute list. Likewise, students have a similar need. This need particularly arises when lecturers seek to have students acquire the desired attributes through self-directed learning. The mutual challenge arises of where to start.

To date, unlike several other Australian universities that have embraced a series of generic graduate graduates, RMIT has offered its staff and students little in the way of direct assistance. Some other universities have begun building resource maps that assist stakeholders to more effectively engage in capability development. RMIT, in contrast, has been slow to foster such resource support. Indeed until the second half of 2010, while RMIT’s learning and teaching strategy listed the desired graduate outcomes sought it offered no detailed account that defined what these attributes meant. Unlike other universities engaged in this form of curriculum direction, RMIT also provided no examples of how such attributes might be realized. In these circumstances, the LTIF project team decided that it was appropriate to produce some resource guides for the benefit of lecturers and students in the SBITAL. Potentially, such guides might also assist a wider audience within the university.

Development of the guides
The Project Team commissioned three Master of Information of Information Management students to construct resource guides for the six attributes that feature in the current RMIT list. Several team members supervised the production of the guides.

The brief given to these students emphasized the following matters.

Engendering such attribute development is a significant institutional undertaking. The University anticipates that will take at least five years to foster the range of outcomes being sought.

Knowledge about suitable resources to support such attribute development can loom as a significant constraint. Academics need to consider how these graduate attributes will manifest themselves in the curriculum and in the behavior expected of students. Often in the past scant attention has been given to considering how such generic capabilities should be infused into professional curricula. As a result, staff is now challenged to locate ideas and materials that can be used to foster RMIT’s preferred graduate attributes more explicitly. Likewise, students increasingly will find themselves faced with the expectation from the University that they take greater responsibility to develop the capabilities in question. This process will likely involve students being expected to employ self-directed learning more frequently to achieve better graduate outcomes.

Therefore, there is a need to create guides that will assist teachers and students in this quest.

7.2 Proposed formats
We envisaged that a guide would consist of:

- A commentary that discusses useful sources;
- A bibliography of items mentioned in the guide; and
- An EndNote file of resources.

The purpose of the EndNote file was to form a foundation for the subsequent development of an electronic database to support graduate attribute development. This is a further project envisaged in 2011. MIM students can work on such a development as part of their WIL obligations.

The commentary was to be organized using a set of headings relevant to the graduate attribute being investigated. Such headings would most likely reflect particular categories of publication. For example, the books, relevant exercises, reflective survey instruments that prompt the responder to think more carefully about a particular attribute, relevant statistics, short opinion pieces that may prompt deeper thinking about an issue, Web.2.0 resources, etc.
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Where possible, the student compilers were asked to offer commentary that described how the content of resources identified may be of assistance.

The guides seek to offer clear instructions about how to access resources described. Obviously, references to the World Wide Web have been tested to see that these currently work as at January 2011. Where appropriate, a guide gives the call number information for RMIT library resources. In other instances, the compilers give locations in the State Library of Victoria call numbers if RMIT does not own a particular item. Priority has been given to describing recent sources.

7.3 Relationship to self-directed learning

When considering a guide’s design, the compilers were asked place themselves in the role of the primary users. They were given the following instructions.

Students will in some instances address attribute development as part of an instructor’s deliberate intent. For example, an assessment task might be designed specifically to have students explore methods relating to innovation. Other times, a student may have more choice in exploring one or several of the attributes. For instance, a free choice project might require greater responsibility by the student to employ self-directed learning approaches. The proposed resource guides should seek to provide a useful starting point such a journey.

For a moment, let’s simulate the type of student need involved. Suppose we ask you to create a self-directed learning project that demonstrates an investigation into some aspects of innovation. A hallmark of your report is that you must show that has negotiated the various steps of Kolb’s Learning cycle. Ideally, a resource guide would help a student faced with this challenge. Similar mental modeling can be applied to each of the RMIT graduate attributes. So, as you work on a guide, continue to put yourself in the shoes of the eventual user. What can you do to make the search for relevant resources a little easier?

Increasingly, the University will expect lecturers to pay more attention to the cultivation of generic graduate capabilities. Academics naturally have a high degree of confidence in particular disciplines, however, until recently teaching generic capabilities has not been a priority. Teachers therefore will find it helpful to locate materials that can be drawn upon as they may work to infuse capability development more broadly into the curriculum.

The Project Team asked the guide compilers to be prepared to draw upon a wide range of sources. In particular, they were asked to identify curriculum materials and survey instruments that might be useful starting points for either staff or students.

The six resulting resource guides are published in an Appendix.

Their publication is seen as first stage. Further refinement by MIM students is scheduled for later in 2011.

In 2011, the guides have so far been released to M.Bus(IT) students studying in Singapore. The release will be expanded to onshore M.Bus(IT) students and BB(BIS) students during semester one. The guides should help support the use of CBOK profiles in the PebblePad Profiler function. This development is discussed in greater detail elsewhere on this LTIF report. Each IS degree has its own profile of skills. Those profiles incorporate the more recent operationalization of opportunities that might be explored by RMIT students and staff to realize learning associated with graduate attributes.
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8. Mapping of staff beliefs concerning the treatment of graduate attributes in SBITAL courseware

8.1 Introduction
A final dimension of the project was to determine how the school’s lecturers teaching into the IS program believed they dealt with the issue of RMIT’s nominated graduate attributes. The project team considered it important to discover what coverage academics gave to the various attributes.

Treatment of the attributes is most probably infused throughout a program. To date, teaching in the school generally has not formally concentrated attention on reviewing the extent to which programs need to deal with RMIT’s recently revised graduate attributes list. Traditionally, the focus has been on fostering work readiness and having students think critically.

8.2 The mapping exercise
The project team devised a form to monitor how lecturers considered that they were currently addressing the issue of graduate attributes. Appendix 6 presents a copy.

The form asked academics to indicate the extent that they believed their courses covered particular attributes. The attributes list was derived from the recent description of attributes published in the RMIT website. This revised list incorporates descriptions of opportunities that could be used by students to explore particular aspects of an attribute. The ratings were to be made on a simple four-point scale.

Apart from having lecturers indicate the extent to which they believed their courses offered such opportunities, the survey also requested if a particular opportunity was formally assessed. The project team considered that opportunities concerning attribute development that were assessed as part of achieving a student grade were more likely to indicate matters taken seriously by teachers and their students. It was therefore reasonable to infer that where such assessment occurred there was likely greater learning involving that attribute.

Forty courses offered in the school that deal with aspects of IS education were analyzed using this survey tool. Both undergraduate and postgraduate offerings are included. In the case of the undergraduate degree, the BB(BIS) the mapping analysis does not cover courses taken as part of the Business Common Core. That core includes eight courses taken by most undergraduate students in the College of Business.

The detailed results from this investigation appear in Appendix 7. The tables presented there show their ratings for the opportunities suggested in the RMIT website for each RMIT graduate attribute.

In this analysis the percentages are based on the results for the forty courses examined. For example, if a result for an opportunity indicated a great extent of 50 per cent this would mean that half of the lecturer ratings indicated that exhibited that extent of coverage.

In vocationally oriented degrees it is unrealistic to expect that all of the attributes are going to receive extensive extent ratings. For example, in SBIT one would not anticipate that cultural awareness is going to feature prominently across many courses.

If there are gaps in the coverage it is most likely to feature where there is little or no treatment in terms of the extent of coverage. Moreover, attributes where there is little or no assessment are worthy of further examination by program teams. Such consideration needs to review the overall results for opportunities in each attribute area.

The following discussion concentrates on teasing out the main patterns from this analysis.

The first pattern reviewed was to identify which graduate attribute opportunities appear to feature most prominently in the extent ratings. These findings appear in Table 29.

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Inspection of the table shows the opportunities associated with fostering active learning and preparing work ready students top the extent ratings. The top listed items are traditional behaviors that have been of concern to lecturers long before more specific attention has been directed at the full range of attributes highlighted in the university’s learning and teaching strategy.

Table 29 Graduate attributes opportunities featuring extensive treatment

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Great extent %</th>
<th>Moderate extent %</th>
<th>Some extent %</th>
<th>Not at all %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Appropriately extract and apply knowledge and skills in meaningful and transformative ways.</td>
<td>58</td>
<td>28</td>
<td>15</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>2. Show initiative and self-motivation in relation to their learning.</td>
<td>55</td>
<td>30</td>
<td>10</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>7. Apply technology competently and appropriately.</td>
<td>58</td>
<td>28</td>
<td>13</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>1. Take active, personal responsibility for their learning.</td>
<td>55</td>
<td>33</td>
<td>8</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>2. Embrace problem solving, initiative and enterprise skills that contribute to productive and innovative outcomes for the enterprise/industry/community.</td>
<td>55</td>
<td>35</td>
<td>10</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>5. Acquire and assess information and its relevance to particular tasks and projects.</td>
<td>50</td>
<td>38</td>
<td>13</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>5. Use technology in a manner that contributes to the effective management and execution of a range of tasks.</td>
<td>50</td>
<td>20</td>
<td>28</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>1. Use communication and team working skills to promote productive and cohesive relations among employees and to ensure tasks are accomplished effectively.</td>
<td>43</td>
<td>30</td>
<td>20</td>
<td>8</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 30 displays those opportunities that attracted the lowest extent of coverage ratings made by lecturers. It is apparent that the categories that feature here involve of some the more recent graduate attributes identified for emphasis in RMIT’s learning and teaching strategy.

A low extent rating is necessarily not cause for concern. For example, realistically one would not expect high extent ratings for some of the graduate attribute opportunities. Matters involving aboriginal people are a case in point. While it may be important that some treatment of such content is present within a degree, we would not expect to see high frequency counts across an entire vocational curriculum using the type of measure employed in this particular analysis.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Table 30 Graduate attributes opportunities featuring a low extent of treatment

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Great extent %</th>
<th>Moderate extent %</th>
<th>Some extent %</th>
<th>Not at all %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Show understanding of the social and cultural heritage of Aboriginal and Torres Strait Islander peoples in Australia through active engagement with individuals and communities.</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>7. Analyse and examine issues of social justice and equality with respect to Aboriginal and Torres Strait Islander peoples and individuals.</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>Cultural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Appropriately apply their environmental and sustainability literacy in a highly diverse range of contexts.</td>
<td>0</td>
<td>10</td>
<td>28</td>
<td>63</td>
<td>100</td>
</tr>
<tr>
<td>Environ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Complement a program of study that is internationally relevant, most RMIT students can build an international component into their program, with options including overseas study, overseas work placements, taking part in an overseas project or showing work in international exhibitions.</td>
<td>10</td>
<td>13</td>
<td>18</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>2. Engage with RMIT’s international education and industry networks, which provide a wide range of opportunities for students to enhance their education or research experience.</td>
<td>13</td>
<td>13</td>
<td>20</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>Environ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Take responsibility for critical decision-making in ensuring sustainable outcomes.</td>
<td>10</td>
<td>8</td>
<td>25</td>
<td>58</td>
<td>100</td>
</tr>
<tr>
<td>2. Appraise and critique context-appropriate sustainability measures.</td>
<td>3</td>
<td>18</td>
<td>23</td>
<td>58</td>
<td>100</td>
</tr>
<tr>
<td>Global</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Appraise and critique context-appropriate sustainability measures.</td>
<td>3</td>
<td>18</td>
<td>23</td>
<td>58</td>
<td>100</td>
</tr>
</tbody>
</table>

The second method of content analysis used to examine treatment of graduate attribute opportunities in the IS curriculum was to consider if such content was assessed.

In each of the forty courses analyzed, lecturers indicated whether or not a particular opportunity to operationalize a graduate attribute was assessed. The following two tables list those opportunities that had the highest and lowest rates of being formally assessed.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs

Table 31 Graduate attribute opportunities that were most likely to be assessed

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Per cent of courses where this item is assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>95</td>
</tr>
<tr>
<td>5.</td>
<td>95</td>
</tr>
<tr>
<td>7.</td>
<td>93</td>
</tr>
<tr>
<td>1.</td>
<td>90</td>
</tr>
<tr>
<td>2.</td>
<td>88</td>
</tr>
<tr>
<td>2.</td>
<td>88</td>
</tr>
<tr>
<td>5.</td>
<td>78</td>
</tr>
<tr>
<td>4.</td>
<td>75</td>
</tr>
</tbody>
</table>

Table 31 reveals that assessment of opportunities that might be typically employed to foster RMIT’s graduate attributes is concentrated on the areas of work readiness and active learning. This finding is unsurprising. Naturally, lecturers are concerned to produce work ready graduates in degrees that have a strong vocational orientation. Likewise, teacher behavior is most likely to be aimed fostering students to become more effective learners. Given the importance of these aspirations, making their realization stick is clearly connected to formal assessment in most courses.

Table 32 indicates the rate at which opportunities to explore graduate attributes are least likely to be assessed by lecturers.

These opportunities are also ones that typically receive lower frequency and intensity of treatment in the forty courses that formed the content analysis. Once more, the lower rates of assessment are not necessarily a cause for concern. Realistically, we would not expect such opportunities to produce high rates of treatment or frequency of formal assessment.

The content analysis discussed in this section of the report, nonetheless, does point to particular challenge when creating an RMIT curriculum that seeks to produce graduates sufficiently capable in the attributes that the university has picked out for emphasis.

For example, the attribute of being innovative is unlikely to result in a program having a number of courses directly concentrating on innovation. The effective treatment and sponsorship of innovation is more likely to be achieved by infusing its treatment throughout an entire program of study. Such infusion is more likely to produce sufficient iterations of relevant learning to make a noticeable change in student behavior. An infusion strategy is more likely to produce sufficient reinforcement of the sought behavior. But there is a challenge. The management of such an infusion strategy to fostering graduate attributes requires a high degree of curriculum management and supervision of students across an entire degree. Such coordination is rarely present and if it is, experience suggests that it is difficult to maintain.
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Table 32 Graduate attribute opportunities that were least likely to be assessed

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Per cent of courses where this item is assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural</td>
<td></td>
</tr>
<tr>
<td>1. Show understanding of the social and cultural heritage of Aboriginal and Torres Strait Islander peoples in Australia through active engagement with individuals and communities.</td>
<td>5</td>
</tr>
<tr>
<td>Cultural</td>
<td></td>
</tr>
<tr>
<td>7. Analyse and examine issues of social justice and equality with respect to Aboriginal and Torres Strait Islander peoples and individuals.</td>
<td>20</td>
</tr>
<tr>
<td>Cultural</td>
<td></td>
</tr>
<tr>
<td>2. Engage with RMIT’s international education and industry networks, which provide a wide range of opportunities for students to enhance their education or research experience.</td>
<td>20</td>
</tr>
<tr>
<td>Global</td>
<td></td>
</tr>
<tr>
<td>3. Complement a program of study that is internationally relevant, most RMIT students can build an international component into their program, with options including overseas study, overseas work placements, taking part in an overseas project or showing work in international exhibitions.</td>
<td>23</td>
</tr>
<tr>
<td>Cultural</td>
<td></td>
</tr>
<tr>
<td>3. Practise non-discriminatory attitudes in relation to all kinds of difference and diversity, not simply culturally but also those based on gender, religion, sexual orientation, identity and ability.</td>
<td>23</td>
</tr>
<tr>
<td>Environ</td>
<td></td>
</tr>
<tr>
<td>3. Take responsibility for critical decision-making in ensuring sustainable outcomes.</td>
<td>25</td>
</tr>
<tr>
<td>Cultural</td>
<td></td>
</tr>
<tr>
<td>6. Assess and evaluate issues of social justice as they apply in particular discipline, vocational and professional contexts.</td>
<td>25</td>
</tr>
</tbody>
</table>

A potential virtue of seeking to use a portfolio created by students to track their learning across their entire life as a student is its potential to provide the framework and reinforcement of relevant experience. In such circumstances, there is a hope that prized attributes will flourish.

We nonetheless need to take a healthy dose of realism. Unless such portfolios and their contents are regularly assessed throughout the entire duration of enrolment such exercises will not be taken seriously either by academics or students. The seriousness of treatment has to be such that if a satisfactory portfolio is not produced each year a student cannot proceed until it is. To do so requires that a sufficient quantum of academic credit points be allocated to the process. Without such allocation, insufficient staff resources can be assigned to produce portfolios that will drive better learning outcomes. Otherwise, use of portfolios is likely to be associated with piecemeal initiatives sponsored by some more enthusiastic teachers. Such fragmentary efforts are less likely to produce an adequate approach to attribute development. At the centre of this curriculum design dilemma is the fundamental issue of sufficient reinforcement of learning. A properly instituted portfolio process focused at a degree level offers better prospects of success.
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9. Dissemination strategies and outputs

The project produced a range of materials and outcomes that are available to relevant stakeholders within the university. Each of these is discussed in turn.

9.1 Mindset of students and its relationship to the fostering of graduate attributes

The project’s mindset findings have been distributed to students who have been involved. This distribution has focused on students reviewing what their mindset is and its impact on the cultivation of graduate attributes. In addition, the students have been prompted to consider if it possible to transform a fixed set of mind to a more growth oriented mindset. Such a transformation is seen as important if a greater proportion of RMIT students are likely to make progress in exploring the attributes effectively.

The findings of the mindset investigations also have been reviewed with colleagues. One workshop run for SBITAL staff in December 2010 has examined the possible ramifications of the finding that possibly 30 to 40 per cent of students possess implicit theories about self and the capacity to learn that are too self-limiting. This workshop was repeated in January 2011 for SBITAL staff. The project team expects to repeat the workshop later in semester one of 2011 for the benefit of colleagues of other schools in the College of Business.

The exploration of the possible impact of mindset upon the promotion of graduate attributes is still in its preliminary stages. The team now has approval to extend its post LTIF project explorations with larger cohorts of students. The aim of these investigations is to increase confidence in the representativeness of the findings involving the occurrence of fixed mindset. Consideration of mindset, additionally, has prompted team members to consider that in future efforts to promote students portfolios need to ensure the exploration of such implicit beliefs are tackled by lecturers and students from the outset.

The LTIF project also worked around the fringes of an interesting prospect. The work of Dweck and her colleagues with their ‘brainology’ course raises the possibilities that a range of educational activities might cost effectively alter some implicit assumptions about self and capacity to change. Team members in their post LTIF project deliberations have therefore commenced considering how might SBITAL create such an educational experience for students who appear to be in need of such development. Apart from the possibility of improving educational outcomes for a wider range of students the creation of such educational materials founded in insights drawn from neuroscience need to be embraced before any attempt is made to foster particular graduate attributes.

9.2 Creation of professional development portfolios (PDPs) for IS students

In 2010, the project initiated portfolios with commencing students in the three degrees selected as pilot cases. In 2011, the processes developed in the project are being continued with the next round of commencing student cohorts as well as being sustained with 2010 entrants.

Work in the SBITAL is continuing with refining how to best use the “Brand You” process initiated in 2010. Part of this work involves working with students and lecturers to see that students continually keep refining their brand statements. Such refinement offers positive prospects of enhancing work readiness, of having students better connect WIL with more theoretical studies, and most importantly having them engage in the process of dealing with attribute development. In particular, project team members are interested to see how the Brand You process might better foster skills that assist students to accommodate accelerating change in the economy and society. This work will include continual workshops with staff and students throughout 2011.

One outcome of the project involved creation of several CBOKs for IS students. These CBOKs are maps of the skills that the SBITAL expects students to explore and master at a preliminary professional level. The CBOKs also include having students document progress made in learning more about the graduate attributes. In 2011, these CBOKs are being trialed with staff and students.
Demonstrating and incubating Graduate Attributes through e-Portfolios and engaging students to reflect on their personal and professional development in programs both onshore and offshore in the M.Bus(IT). These trials proceed on a voluntary basis because no credit points can be assigned to support the initiation of a program level PDP. In the case of the M.Bus(IT), the degree is undergoing a minor revision in 2011 preparatory to an accreditation visit by the ACS in mid-year. In 2012, the revision process envisages that the PDP will become a compulsory component of the M.Bus(IT). These developments will be monitored. Where appropriate the results will be communicated in RMIT forums and relevant professional conferences and journals. Depending on what is discovered concerning the efficacy of these PDPs and their related CBOKs, the SBIT will then consider their extension to undergraduate IS students. The overall idea of PDPs and CBOKs might then be extended to the degrees of offered in information management and logistics.

These explorations involving ‘Brand You’, PDPs and CBOKs operate inside PebblePad software. Such involvement also offers further dissemination possibilities for the experiences and ideas arising out of the current LTIF project. The team will join with other PebblePad users at RMIT during 2011 to consider how to best harness the potential of this tool.

9.3 Resource guide to support RMIT graduate attributes
The resource guide created to assist lecturers and students explore aspects of RMIT’s graduate attributes is freely available. Initially it has been published in March for the benefit of all lecturers and IS students in the SBITAL. Copies in PDF format have been distributed as an email attachment. The guide also is scheduled to be published in the School’s website so that it is accessible to all interested parties.

Within the College of Business the existence of the guide is being drawn to the attention of relevant learning and teaching committees.

A workshop dealing with the outcomes of the project scheduled for April 2011 will in part advertise and deal with the use of this resource.

Within the School plans are in train to further refine the guide in 2011. Students in the Master of Information Management will revise and extend the content. The material described will also be released in EndNote format for the benefit of lecturers and staff.

9.4 Forms and presentations
A range of materials was created to support the project. Some of these appear as appendices in this report. Such materials as well as other content that may be of interest will be made available from an archive in the SBITAL website. In the case of forms and profiles developed in PebblePad, on request these items can be released to interested parties in that software.
10. Evaluation of project outcomes

The project used a range of formative evaluation processes to gain insight into how students viewed the issue of graduate attributes in the curriculum. These surveys represent a form of market research into how students view the concept of the ‘graduate attributes’ product that RMIT is seeking to sell to academics and students. It would seem ill advised not to explore how students viewed such matters at the outset of the project.

The results of these investigations indicate that for the most part many of the students in this project believed that they had or were achieving moderately high outcomes with respect the RMIT graduate attributes. Of the attributes where they appear to confess to lower levels competence is likely to involve innovation. Lower levels of perceived competence and interest also centre on matters of environmental sustainability. Those interested in fostering the attributes need to be mindful of these results. As far as this author is aware, to date, RMIT has not previously produced as a rich and extensive a look in what students think about the graduate attributes. Granted this project has confined itself to students in a single discipline. The results, however, have a wider importance for the university. Other schools need to explore similar questions with their students to establish how representative the findings from this project are.

Of particular interest are the explorations into the implicit mindsets of students and consideration of whether or not such mindsets are likely to impede learning. In the project, only exploratory survey methods were employed to see if some preliminary estimate might be made of the extent to which restrictive self-theories might prevail in the student cohort of interest. Further investigation needs to be done involving the robustness of the measurement used to establish mindset. Most importantly, there is work needed to establish if there are clear deleterious consequences for learning outcomes for RMIT students who have a ‘fixed’ mindset. The notion of mindset also raises the prospect that if it does have adverse consequences for an important proportion of students then what can be done to arrest this challenge. Before considering the list of generic graduate attributes RMIT might usefully direct more attention to the mindset issue. Such a discussion raises the possibility of interesting experimental research. Part of the exhortations surrounding RMIT’s new five-year plan urges boldness. Gaining a better insight into managing the mindset of students and for that matter that of teachers presents such a bold challenge. Furthermore, should such investigations prove the efficacy of such effort, RMIT would be better placed to present itself more favorably in an increasingly competitive educational market place.

A good portion of this LTIF project was directed to capacity building. In many respects therefore it is too early to be able to complete summative assessments that will exhibit useful content. The following discussion elaborates why this is so.

In the case of the use of the Brand You concept to have students think about how they might think more directly about their professional development we do have some positive data. After initial completion of brand your processes, surveys or students report that about 85 per cent report that it was an important stimulus in having them thing about their learning. In contrast, while the participation rates in the first rounds of using brand you were encouraging, over sixty percent in a voluntary system, the activity rate fell away in subsequent rounds. There was also the issue of the quality of the statements. The brand you process in reality is challenging for most people who first try it. It requires repeated tries to refine content and direction. It also needs mentoring and feedback. While it the brand you idea has interesting potential it is unlikely to flourish until it becomes part of formal assessment required to pass a course or graduate. In the case of the SBITAL and its IS degrees, being able to ensure formal assessment to effective mastery of brand you will not occur until 2012. A more realistic appraisal of what might be achieved therefore is unlikely before the end of that year. There is also the issue of what is a reasonable gestation period when seeking to foster such portfolio developments. The first cohort of students has only been exposed to the idea for the first year of their degrees.
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Likewise, the creation of CBOK profiles as part of the PDP process for the IS degrees in this LTIF project has been in a capacity building phase. The product has been created. Only through action research in 2011 will the SBITAL gain some better idea about the usefulness of such an approach. As with the use of brand you the use of these CBOK profiles will into 2011 be limited by the fact that student involvement relies upon a strong voluntary involvement. It is not until 2012, that current revision of the M.Bus(IT) will force students to take the mapping of their learning and use of more self-directed learning seriously. From that point onwards students need to provide evidence of appropriate of engagement if they are to graduate. Once again, a clearer picture of processes and outcomes is unlikely to emerge before the end of 2012. Obviously, appropriate steps will be taken to use formative and summative evaluation to consider what the net benefit of these initiatives, if any, is.
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References


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