

Developing and Assessing Work Readiness using Reflective Practice

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One of the most significant assessment challenges in higher education is how to authentically assess the acquisition of graduate attributes. When the assessment of attributes is developed to prepare students for the real world context or work place, it becomes even more challenging and complex. This paper presents a study of assessing work-integrated learning: a curriculum intervention within the discipline of the Built Environment, which sought to actively foster the development of graduate attributes to prepare students for the workforce. The research explores how the assessment of graduate attributes can be validated, and ultimately enhanced, by understanding the learning journey from the student perspective. The research focuses on the distinctive issues associated with Work-Integrated Learning (WIL) using an industry-mentored project, on a construction related issue. The students were asked to capture their reflections in the form of reflective diaries, which were prepared weekly throughout the subject. The research showed that many students expressed very positive views about their learning experiences. This occurred in spite of the challenges caused by the formal assessment process that were undertaken as part of the subject. The implications of the study are examined in relation to both the construction management discipline and wider context of assessing graduate attributes in higher education The paper suggest that giving voice to the student-learning journey offers a powerful lens through which the assessment of attributes can be validated.

Key words: work-integrated learning, graduate attributes, cooperative education, construction

Introduction

In spite of almost universal agreement on the need for graduates to possess such generic skills and knowledge, the assessment of the development of these graduate attributes remains a challenge for educators. Traditional approaches to assessment have not typically focussed upon the measurement of generic graduate attributes (eg. critical thinking, teamwork, communication) nor identified frameworks for assessing student progression towards work-readiness. Yet construction and built environment employers are increasingly demanding these employability attributes, stressing the need for measurement of student performance against these qualities (Curtis & Lucas, 2001)

Past research has indicated that work-integrated learning (WIL) significantly contributes to the enhancement of work-readiness. Previous studies have suggested that improved learning is the result of university/industry partnerships (Costley & Armsby 2007; Harvey, Moon & Geall 1997). This research has called for the introduction of closer links in order to provide "transformative" opportunities for students". Harvey et al, (1997) p11 states "it is not about delivering 'employability skills in some generic sense, rather it is about developing critical lifelong learners…so the focus needs to be on empowering students to become critical learners." The transformative power of assessment is well documented. As the literature describes, assessment defines the very core of the curriculum (Ramsden, 1992), which includes defining what students regard as important and how they come to see themselves as both learner and graduate.

This paper seeks to investigate how to assess the development of graduate attributes in ways, which foster and deepen student's learning. The author presents findings from a exploratory study that investigated the efficacy of an

assessment approach that was applied to a work-integrated learning subject within a construction management degree. This work-based learning subject was piloted to a small group of eleven who were in the third year (of four) of their undergraduate studies.

The research examines the pedagogic implications of going beyond student's formally assessed learning to examine attribute development as captured via reflective diaries. The authors define attributes to include skills, knowledge, human qualities and dispositions (Barnett 2004; Holmes, 2000; Stephenson & Yorke, 1993), and view the development of attributes from the perspective of lifelong learning (Bowden & Marton, 1998; Stephenson & Yorke, 1993). The implications of the findings are analysed in relation to pedagogic, challenges and opportunities inherent in assessing attributes, and which encompass learning beyond traditional university learning experiences. The findings of this research will inform the future of the WIL courses in construction management, and raise issues about the assessment of work-readiness within the wider context of undergraduate education. The next section firstly outlines the work skills and generic attributes, and then secondly describes the student-learning environment used in this study

Work Skills and Generic Attributes

In the last decade, much attention has been given to the development of graduate attributes in higher education. As Bath and Smith (2006) identify, the increasing value placed on attribute development can be attributed to the now popular view that education is lifelong, with the increased focus on the relationship between higher education and employment outcomes. It is within this context that universities are challenged to develop and implement assessment practices that can, as Boud and Falchikov (2006) advocate, "lay the foundation for a life time of learning" (p.400).

Implicit in the expectation that universities will foster generic graduate attributes are that these attributes are transferable. It is expected that they will prepare students for futures unknown (Bowden & Marton, 1998; Stephenson and Yorke, 1993), and the assumption that they fill gaps between "the increasing diversity of universities as learning sites, and the divergence of knowledge within universities that can be bridged" (Barrie and Prosser, 2004, p.3). Also, graduate attributes are assumed to be applicable to diverse contexts and settings (Barrie & Prosser, 2004; Boud, 2000), and commonly encompass characteristics like; critical thinking, problem solving, communication skills, ethical practice and, logical and independent thought (Bath, Smith, Stein & Swan, 2004). Past research into the development of graduate attributes has confirmed, (Bath et. al, 2004; Bath & Smith, 2006; Clanchy & Ballard, 1997), that generic attributes are most effectively developed within the context of disciplinary knowledge, "integrated and embedded in a curriculum" (Bath, et al., 2004, p. 314).

As the literature further identifies, capturing attribute development presents significant pedagogic, conceptual and practical challenge for teachers in higher education (Barnett, 2004; Barrie 2005, Bowden & Marton, 1998; Prosser &Trigwell, 1999; Susiman and Goodfellow, 2004). Beyond cognitive understandings, generic attributes introduce complex conceptualisations of interwoven skills, abilities, affective knowledge and dispositions (Fallows & Stevens, 2000; James, Lefo & Hadi, 2004). This approach assumes a more learning orientated to assessment (Boud & Falchikov, 2006), and presupposes learner engagement in authentic learning settings (Bowden & Marton, 1998; Stephenson & Yorke, 1993). In order to successfully assess the acquisition and development of graduate attributes, educators are required to evidence learning which goes beyond the representation of knowledge, to encompass how students actually think (Barrie, 2004; Bowden &Marton, 1998; Stephenson & Yorke, 1993). Yet as Barrie (2005) suggests, effectively teaching and assessing attributes is difficult in traditional university experiences and presupposes learner engagement in authentic learning contexts.

Australian universities have in recent years increasingly engaged with industry, professional bodies and communities (Costley, 2007; Curtis, 2001; Harvey 1997). A key imperative for this engagement has been to foster and evidence attributes, which will prepare students for their future professional practice through authentic learning experiences. Beyond traditional work placements and industrial experience, engagement between universities and industry has seen the emergence of work-integrated learning (WIL). These pedagogies, commonly articulated through university

learning and teaching policy, assume a student centred approach to learning, and further challenge still dominant models of knowledge and content transmission (Usher, 1996).

Work readiness has become an increasingly important imperative within the discipline of the Construction Management. Similar to the wider workforce, employers within the construction industry expect graduates to possess not only practical and theoretical knowledge, but to also have acquired a suite of generic attributes to ensure that graduates are work ready and equipped to respond effectively to real world issues (Hager, Holland &Beckett, 2002; Love, Smith & Georgiou, 2003). Such generic attributes include critical thinking, problem solving, ethical and socially aware practice, communication and negotiation skills, leadership and logical and independent thought. It is the assessment of such attributes that we explore in the following sections of this paper. The next section describes the student-learning environment.

Learning Environment

The aim of the subject entitled " Work-integrated Learning in Construction" was to provide a university-centred WIL experience that was mentored by industry. The project took the form of a consulting-type exercise for an industry client/mentor. The subject was developed as a form of work-integrated learning (WIL), to provide students with the opportunity to apply their academic learning to real world problems, situations and issues. The purpose of reflective practice in this instance, was to provide students with an opportunity to develop in-depth reflections of their learning experiences.

This research project was the second phase of work previously undertaken a year earlier. The results of the first phase demonstrated that industry had considerable good will towards the concept of WIL. However, the industrial employers were clear that educational development was not a significant part of the commercial realities of their own work places. The key results of the previous research project indicated that the construction industry was looking for the development of WIL in two areas, namely; university-centred assessment processes that includes qualitative advice from industry, and robustly tested business-orientated models that provide long-term collaboration opportunities for industrial partners.

The current phase of this research was designed to provide a preliminary/exploratory solution to the issues previously raised by industry stakeholders (Figure 1). The course was set up to provide a vehicle to develop work-readiness and employability skills, and was undertaken as a pilot study of 11 enrolled students.

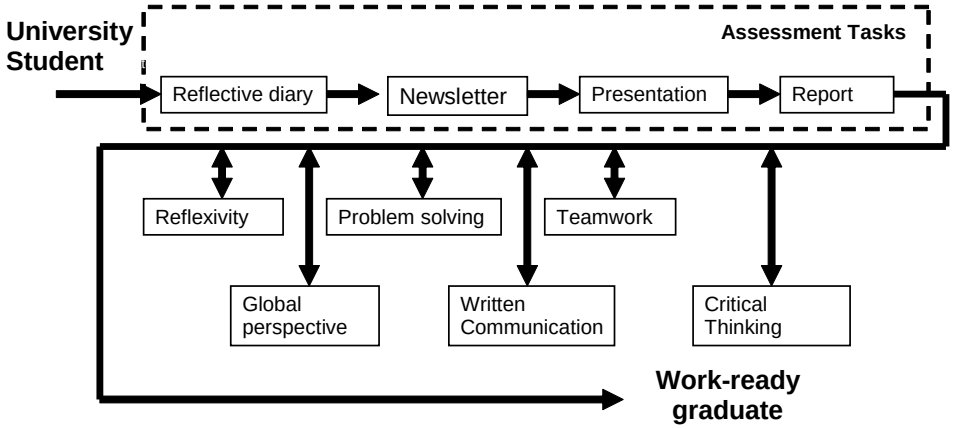

Figure 1: Teachers intended learning journey

The course comprised 4 types of assessments; reflective diary, newsletter, presentation and final report. The objective of the assessment was to measure the development of work-ready graduate attributes. The assessment task

and weights were shown in Table 1. The next section of the paper describes the methodology adopted to explore the development of graduate attributes.

Method

As qualitative research, the authors employed a grounded theory approach in order to capture and discern how students, and their teachers, perceived attribute development. The research methodology was also informed by a phenomenographical approach since the purpose of the study was to capture how individuals experienced the subject from their own perspective (Akerlind, 2005). The assessment approach utilised in this study, emphasised a formative approach. The assessment tasks were designed to facilitate student's active engagement in learning, to ensure that there were opportunities for teacher, industry mentor and peer feedback, and to provide opportunities for self-assessment through reflection. Other than the reflective diaries, all tasks were undertaken as group work since the teacher sought to create a learning community, "that emphasises social interaction and identify over individual action, collaboration amongst students and active engagement in problem solving" (Bath & Smith 2006) p266

Following negotiation with the teacher and the industry partner/mentor, each group identified a construction-related industry issue: Group One-Occupational Health and Safety; Group Two-Work Life Balance. Authenticity was embedded in the assessment tasks, as students were required to investigate the issue in the construction and wider regulatory and policy contexts, and formulate appropriate strategies and recommendations for their industry partner/mentor. Whilst discipline knowledge is not considered to be generic, this attribute was considered by the teacher as fundamental to the outcomes of any undergraduate course, and thus included as an intended learning outcome. In tother words, all with the development of generic attributes, the teacher hoped that the student would learn something about the discipline of construction.

Reflective diaries were undertaken weekly after each face-to-face session, and were supposed to allow students to unpack their experiences, using a written blog or diary style. It is not clear whether the "open style free-flowing" approach produced the best reflective practice. Nevertheless, students did use the diaries on a regular basis and made extensive comments about their perceptions and experiences. A email was sent to all third years Construction Management students, a total of 11 participants were interviews and selected as part of the study; 10 were male and 1 was female. The aim of the reflective diaries was to provide the student with an opportunity to more deeply examine their experiences in the WIL style of the course. But from the teachers perspective the use of reflection was a challenge to assess. The teacher was new to the use of the diaries, and did not direct the students on the best way to reflect, instead encouraging free flowing unstructured comments in their diaries.

The teacher also re-examined student's performance as captured through the formal assessments (assignments eg. newsletter, presentation). In undertaking a personal refection on the assessment practice, the teacher paid particular attention to the degree to which student's evidenced generic attribute development. The teacher then cross-referenced the two sources of data (reflective diaries & assignments) to identify the degree of alignment between student's perceptions of their attribute development and the teacher's perspective of learning as captured via the assessment. The next section presents the student perspectives and the teachers' reflections in order to provide insights into the development of generic attributes

Results

The first section explores the teacher's perspective of the usefulness of the formal assessments in evidencing attribute development. This section also included the results of the Course Evaluation Surveys (CES) completed by the students as part of the university-wide quality assurance processes. The CES surveys are undertaken using a standard format for all courses offered by the university. This information enables the university to judge the quality

of its courses across the programs, schools and the wider university. The second section analysed the intended student learning outcomes, which were planned as part of the assessment process. The reflections were based on re-reading and analysing the students' reflective diaries. The re-analysis occurred some months after the completion of the course. The author read and analysed the transcripts as evidence of attribute development

The Teacher Perspective

As previously mentioned the assessment tasks were designed to facilitate student's active engagement in learning, to ensure that there were opportunities for teacher, industry and peer feedback, and to provide opportunities for self-assessment through reflection. Hence, the approach emphasised formative assessment. Whilst discipline knowledge is not considered to be generic, this attribute was considered by the teacher as fundamental to the outcomes of any undergraduate program, and thus included as an intended learning outcome.

Table 1

Course Assessments

Assessment Type	Intended Attribute Development	Teacher perspective
Industry Newsletter (10%): Investigate industry issue and develop a marketing and awareness raising strategy	Teamwork, discipline knowledge, critical thinking problem solving, professional communication	Group One: Roles of group members not clear. Students struggled to identify particular roles within the team, and to provide peer-to-peer feedback; approach to industry issue was limited and required more in depth analysis. Group Two: Effectiveness of team function constrained by a lack of cohesion amongst the group; newsletter demonstrated a degree of independent analysis and research, but overall approach and analysis was limited
Project Report (50%): Examine and formulate strategies in response to industry issue; analyse relevant, contemporary research, and analyse issue at the local level and in relation to wider socio political, economic and regulatory contexts, national and international	Teamwork, discipline knowledge, critical thinking, problem solving, professional communication, global perspective	Group One: Demonstrated understanding of discipline knowledge and technical content, some critical analysis evidenced, links between report and the implications for the industry beginning to be established, effective teamwork not evidenced. Group Two: Similar to group one, with some further evidence of critical analysis of current research, and greater depth in understanding the wider industry context
Oral Presentation (20%): Presentation of project report to industry partners, peers and wider university community; exchange of ideas with audience, responsiveness to questions and feedback	Teamwork, discipline knowledge, professional communication; critical thinking, global perspective	Group One: Limited collaboration and cooperation between members of the group evidenced, with inconsistencies in appropriate use of communication (tenor, mode) displayed, and overall limited critical analysis of primary and secondary sources. Group Two: Similar to group one, with a heightened degree of awareness of audience

		and context demonstrated, and a more analytical approach to the industry issue
Reflective Diaries (20%): Weekly entries recording and reflecting on learning	Reflexivity, communication	Students did use the diaries on a regular basis and made extensive comments about their experiences. For the majority of students, diary entries though contained minimal reflections with for some students there was a lack of clarity as to the purpose of the reflective diary evident. Where students did reflect on their capability and learning this related to the importance of team work including; their own group's dysfunction, the need to develop strategies when dealing with uncooperative team members, and the need for more industry exposure and analysis of their industry issue.

The results (Table 1) show the comments that were provided to students. It may be important to note that due to the experimental nature of the subject, and the small number of students involved. The teacher did not want to motivate students using a highly structured marking scheme; instead the aim was to reward students who demonstrated ability to develop deep reflections about their learning experiences. It is well known that this is difficult to achieve in practice as part of undergraduate education, but it was hoped that under the right conditions it would be possible.

Whilst students displayed inconsistent and/or limited attribute development through their formal assessments. Particular attributes, such as problem solving and teamwork were perceived as having been developed throughout the subject; importantly, students did come to know themselves as learners. As the reflections revealed, students could be situated across a spectrum of self awareness and were to varying degrees able to discern some of the human qualities, dispositions, skills and knowledge they needed to engage effectively as a professional. They did exhibit the beginnings of what Kember describes as a learning orientation to their education (Kember, 2008 p. 43). This meta cognition, lies at the heart of life long learning and is a critical determinant of graduate capability (Bowden & Marton, 1998; Maclellan, 2004). Students also demonstrated degrees of transformation in learner identity. Studnets did change their thinking from a view of, teacher as expert, to one in which the students were beginning to see themselves as active participants in their own learning, and well as co-creators of new knowledge.

In addition, the results of the student surveys were very positive; the overwhelming response from students was that they enjoyed the subject and were enthusiastic about their experiences. The Course Evaluation Survey (CES), which was administered centrally by the university, produced a Good Teaching Score of 95%, which was the highest in the School and is amongst the best in the university. This encouraging result was evident from not only the survey scores, but also from written comments made by the students. In particular students were particular pleased with two aspects of the course, relating to "workplace confidence" and "career development".

Although the number of enrolled students is small (n=11), which does not permit any detailed statistical analysis, all enrolled students agreed that the course improved their confidence in tackling unfamiliar problems, with a mean score 4.4 (of 5). Many positive comments were put forward in the surveys support of this new confidence.

"I think that my confidence actually built as I began to meet more (industry) people, so that's one thing that sort of grew out of the course, which was really good."

Other results from the CES survey showed that the course improved their career development. All students believed that "what they learned could be used in their future career" with a mean score of (4.6 of 5). This was not surprising because the principal aim of WIL was to prepare students for the world of work. However, it is a comforting outcome and supports the research by Harvey, Moon & Geall (1997) p11 who states "it is not about delivering

'employability skills in some generic sense, rather it is about developing critical lifelong learners" The next part of the paper examined the students' perception of their own work-readiness.

The Student Perspective

The next part of the analyses examined the reflective diaries of students' of their own work-readiness. The results (Table 2) show the generic attributes that were considered to be a proxy for the students learning journey.

Table 2

Student perception of the development of work-readiness

Generic Attribute	Descriptive Example
Critical thinking	"From the reading that I have done about OH&S it seems that "worker attitudes" is one of the major contributing factors to safety in the workplace. This is a difficult issue that I believe needs to be investigated with regard to the OHS systems put into place"
Problem Solving	"I believe that I am now more informed and aware of the level of thinking and strategy required to formulate a response to an industry issue and considered that I am now better placed to deal with an unknown issue in the future"
Team Work	"Two of the team members, who we have had issues with all semester, tried to control everyone and who took no notice of what other members are saying… This was infuriating as we had sent 2 emails to everyone in the group confirming, timing, attire and etc…. I came to the realisation that (the two team members) were not going to adhere to the guidelines (previously agreed) and we would have to alter our presentations on the fly"
Communication	"For some reason some people dread presentations, I on the other hand have no issue with them and look forward to giving them, sure I get nervous but it's all part of the process and once I get going I get into a rhythm and I'm set. That was my main motivation for taking charge on the presentation because from the looks from the rest of the group they weren't too keen on it."
Reflective practice	In a live lecture you constantly miss out on things because you a writing down something. The lecturer speaks too fast that you don't have time to write all the important things down. However, hopefully the issues are taken into consideration whenever we discussed them again this reiterates the importance of the blog (reflective diary to capture thoughts) and how they are used.
Global perspective	"(The industry mentor) stated that these days earning a lot of money does not always make up for losing free time, especially for a family man. This is something that I never really thought about, I think it's mainly due to the fact that I don't have a family with kids to look after"
Technical knowledge	"…. the experience of actually applying theory to practice and to gaining direct feedback from industry improved my understanding of the (technical) issues"

The following discussion relates to the data in Table 2

Critical Thinking: Critical analysis and independent thought was considered vital to successfully meeting the objectives of the group report and group presentation. Broadly, the students who identified a heightened awareness of *Critical Thinking* defined this attribute as encompassing the analysis of diverse sources of data, the capacity to distil information according to reliability, validity and currency.

The role of the WIL course was to provide an environment that encouraged critical thinking. The results of past research (Mills, A, McLaughlin & Robson 2008) showed that employers believed that gradates displayed an overly uncritical view of the world that could be construed as being almost naive. While this is not surprising especially for students that have not worked before in industry, it represented an opportunity to introduce them to some of the wider views and issues that will confront them when they join the world-of-work.

Problem solving: Broadly, all students perceived that they had developed a deeper understanding of the qualities and skills required to address problem solving. Students perceived that their problem solving ability had been enhanced primarily because they had experienced dealing with uncertainty, ambiguity and complexity in a real life situation on the ground. All students identified that they had developed their ability to undertake independent research, with one student identifying that this was an area that he or she needed to develop more fully in the future.

Team Work: Whilst the students expressed their misgivings about their team's performance, and perceived that there was a lack of cohesion across their group, they also perceived that they had developed a heightened awareness and understanding of team work as social practice, and of the factors which both impede, and enable, effective team function.

Communications: The course did seem to encourage the development of communication, both written and verbal. Students said that overall they enjoyed the experience that the report and presentation provided and believed that it had development them as individuals. However, not all students had done presentations in the past, so it became clear that there were different levels of experience within the groups.

Global Perspective: Most students had some understanding of wider industry and global contexts. For these students, increased understandings of current and emerging industry needs and trends, and of the economic and regulatory drivers that shape industry practice were identified as having been developed.

Technical Knowledge: All students identified that their understanding of discipline knowledge had been broadened and enhanced. As an example, one student attributed this to gaining the experience of actually applying theory to practice and to gaining direct feedback from industry. For others they suggested that it enhanced understandings of the discipline knowledge were also attributable to the opportunities provided through the course to gain direct feedback from industry partners.

In summary the students through their diary entries, expressed a range of views that indicated that they did develop graduate attributes. It is reasonable to suggest that the attribute development was not uniform across all students but there was some evidence that each student had positive sentiments about their learning journey. The next section of the paper examines some of the issues involved with the development of graduate attributes in trying to accurately determine if work-readiness was being developed.

Discussion

The research was the second phase of a earlier study, which explored the employers perspectives of WIL. (Mills et al ., 2008). Results of the previous research showed that industrial employers were not equipped at assessing educational development in their work places. The key results of the previous project indicated that the construction industry was looking for the development of WIL in two areas, namely; university-centred assessment processes that includes qualitative advice from industry. The educational model used in this study was designed to address issue of workplace assessment.

Such preparation and guidance includes explicitly modelling the practice of reflection for students, building on student's learning and fostering a learning climate in which students are supported to share their experiences with their teacher, peers and other learning partners. Actively fostering student's capacity for reflection was necessary for students in the study, as they required a more teacher-guided approach to support reflective practice. Activities such as guided debriefing sessions and self-assessments offering a mechanism to enable and support student's critical reflections. Guiding the process of reflection by, for example, providing prompts or a series of reflective questions for students to respond to at different stages of their learning, would have similarly provided a learning framework upon which students capacity for reflective practice could have been identified and built upon.

Student's prime motivation to undertake the subject was to make industry contacts and enhance their employability prospects after graduation. Yet, at the conclusion of the course, students demonstrated an explicit and deeper awareness of both the value of attributes, in relation to employability, but beyond this to their personal development and future learning.

From the teacher's perspective, the assessment of attributes had presented significant challenges that included how to know the level of a student's capability at the commencement of the course; and how to measure attributes that are interwoven clusters of skill, knowledge, dispositions and ability. Findings from the study reinforce both the recognised need for assessment to be consistent with the teaching approach (Biggs, 2003; Kember, 2008; Ramsden, 1992), and for teachers and students to engage in a discursive dialogue to nurture critical reflection through the exchange of skills, knowledge and practice to inform identity.

The teacher had assumed that students would embrace opportunities for self managed learning, and that they would bring to the assessment tasks a capacity to direct and reflect on their learning and a developed awareness of working with others. This research showed that while this was evidenced in the diaries of some students it was not universal across the group. The findings of the study reinforced the importance of preparing and guiding students through the process of reflection that, as Boud (2001) identifies, is vital to successfully engaging students in critical reflective practice. This is particularly so for students being introduced to reflective practice as was the case in the elective discussed here.

As the literature identifies, building a rapport and coherence across a learning community is also vital to supporting self-reflection (Kember, 2008) and to stimulating the development of higher order capabilities. Student's levels of comfort with the notion of teacher as expert, and levels of discomfort with the student-centred learning approach adopted in this study, were in part the result of their past undergraduate experiences of assessment. This impacted on student's performance in their assessments and confirms the importance of shifting the assessment from a traditional summative form to a reflective formative approach. The challenges this presents for teachers in higher education are highly complex and compounded further in the mass education environment. Further research is necessary to develop mechanisms to support change in the teaching and learning practices in order to facilitate better educational outcomes for students and society in general. This remains a challenge for university education which has had an over reliance on traditional approaches to teaching, learning and assessment.

Conclusions

In higher education research there is a growing interest in the importance of work-integrated learning, which is defined as linking learning to the roles in work. The significance of this research was that it demonstrated that the assessment of such skill development is challenging and is awkward using traditional assessment modes. Findings from the study also suggest a possible lack of coherence and integration in the development of work-readiness across the wider Built Environment programs, since program coherence is fundamental to the development of graduate attributes.

The results suggest that the process of capturing the student perspective through the assessment practice offered rich insights into attribute development including the evidencing of unintended learning, and enabled complex and interconnected dimensions of achievement. The findings will inform the on-going development of the WIL and suggest that further research is needed to explore the assessment of graduate attributes. So too is research which systematically explores the symbiotic relationship between authentic learning and discipline-based construction knowledge, a snapshot of which was captured by the study.

The development of professional competence in practice of construction management is an important issue. It is common concern that; in these days of cost cutting, decreasing resources, and increased student numbers, that developing students as reflective practitioners may be viewed as an unaffordable luxury. The importance of this paper is that it suggests the reflective practice can helps equip the graduate with the competencies necessary to meet the challenges of a changing world.

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