Paving a professional pathway: work integrated learning in Construction Management and Nursing and its implications for Engineering students

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Abstract: *Many disciplines are currently exploring ways to either initiate or improve the engagement of their students in work integrated learning (WIL). The disciplines of Construction Management (Con Mgt) and Nursing are no exception and have collaborated in an Australian Learning and Teaching Council (ALTC) research grant entitled 'Facilitating work integrated learning through skills-enabled e-Portfolios* (*electronic portfolio platforms were reviewed as part of the project as a potential tool to support and document WIL experiences, these platforms are not reviewed in this paper) in the Con Mgt and Nursing disciplines' led by The University of Newcastle, Australia. In both of these disciplines, employers expect students to be 'work ready' on graduation. Nevertheless, students often question the relationship between the theoretical concepts they are taught at university and their experiences of the 'real world'. This paper investigates this issue, the nature of student engagement of theory whilst on placement, and offers a possible solution through reflexive practise. To do this, the paper briefly describes the ALTC research project and discusses findings from the quantitative and qualitative data gathered from the competency statements of accreditation professional institutions, focus groups and an on-line survey. Initially, it aligns the competencies Con Mgt and Nursing students garner during their placements and then proposes a reflection framework as a means of closing the gap between theory and practise. This framework offers an example of how students could reflect on their level of competence through reflective questions. The paper then explores students' own views on their placement experiences, such as methods of integrating practise and students' feelings of preparedness to enter their professional placement. Engineering disciplines that align with Con Mgt may find value in this study.*

Introduction

A professional career pathway can be daunting to students who have had no experience in industry until they graduate. Consequently many construction, engineering and nursing degree programmes incorporate work integrated learning (WIL) experiences within their programmes. Indeed, many of the professional institutions that accredit these programmes require students to engage in such activities. The paper discusses the findings of the aforementioned ALTC project that relate to WIL.

The study investigated how students make meta-cognitive links between the theoretical concepts they are taught at university and the experiences they have on placement. It then explored ways to promote links between these through the development of a competency alignment and reflection framework. Con Mgt and Nursing academic staff (approximately one hundred and twenty participants in total)

took part in phone interviews and/or focus group sessions, and (approximately two hundred) students participated in focus group discussions and/or an online survey during 2010 to 2011. This paper reports specifically on the development of a reflection framework that could assist students relate their WIL experiences to their studies, and their observations and comments on WIL from the focus groups and online survey.

The Importance of WIL experiences

WIL is the term used to describe educational activities that integrate theoretical learning with its application in a workplace, profession, career or future employment (Patrick, 2009). WIL is defined in this project as integrated experience for everyone in University programmes, not just the fortunate few who experience such opportunities. It is argued that students learn in the real world through WIL, as they make contacts with industry personnel, and are exposed to relevant work practises. A recent ALTC discipline based initiative study (Williams, Sher and Simmons, 2009) in construction education identified WIL as an area that offers considerable benefits to students. For example, students who participate in WIL are generally motivated by their experiences and demonstrate better teamwork and communication skills (Williams et al., 2009) and have a better understanding of how to apply their knowledge in practise. In addition, they are better able to cope with other complexities relating to professional practise (Mills & Treagust, 2003). Students also need these WIL opportunities to apply their conceptual knowledge so that it becomes grounded in real world experiences. Research has shown that when students start employment they frequently find it difficult to relate theory to practise. However, once they have been exposed to the workplace, they tend to modify their views (Williams et al., 2009). Therefore, it is crucial that students have opportunities to engage in WIL to make these connections.

The work-place requires work-ready graduates who understand and can operate in real world contexts. Many professional bodies thus require university students to engage in WIL. However, this often causes students to question how the theoretical concepts taught at university relate to the world of work. These issues surfaced in the aforementioned ALTC project which investigated the issues and opportunities confronting construction education (including construction management, quantity surveying and building surveying) in Australia (Williams et al., 2009). Students and academic staff participating in this study were of the view that WIL and university experiences generally did not reinforce each other and were often treated as unrelated entities (Williams et al., 2009). Likewise, a similar ALTC report on engineering education identified the importance of WIL in student engagement and similar issues, such as the need for increased industry contact and experiences for students (King, 2008). The current study reported here aimed to understand, address and resolve some of these WIL issues highlighted in the literature.

Developing professional pathways

In Australia, the dominant method of developing Con Mgt competence is through WIL. Engineering is slightly different with these students' learning activities (including WIL) contributing to the development of the stage one competency standards required by Engineers Australia. Overall, a level of resources and strategies is needed to streamline entry level abilities to ensure students are constantly contextualising theory during their industrial placements. The Australian Institute of Building (AIB, AIBS, AIQS, 2008) requires students to engage in 520 hours of WIL. Similarly, Engineers Australia requires students to complete a minimum of 12 weeks industry placement. Notwithstanding this, there are currently issues with how WIL is implemented in both disciplines. For instance, no quality control for WIL is prescribed by the bodies accrediting Con Mgt programmes. Consequently universities need to interpret, administer and monitor WIL in accordance with their own policies (Williams et al., 2009). With respect to Engineering, Richardson, Kaider, Henschke & Jackling (2009) discuss the issue of assessing work integrated learning in engineering programmes. They state that "the underpinning cause for inadequate WIL assessment is a lack of understanding of the nature of learning in the work place" due to the ad hoc nature of learning in this situation (such as learning 'informally') (p. 338). It is pertinent to note that this issue is not confined to engineering and is experienced in other disciplines. The outcomes of these inconsistent approaches lead to contradictory student learning experiences, which in turn lead to poor graduate experiences. In both engineering and Con Mgt,

reflective practise is embedded in the professional development practises prescribed by the relevant accrediting professional institutions. The requirements of the nursing discipline are similar, with some universities requiring reflective portfolios as assessment tasks (Australian Nursing and Midwifery Council 2008; Andre 2010). Nursing differs in that students partake in a placement every year, with the complexity of tasks they are expected to take on increasing year on year. For example, first year students may be expected to bathe patients whilst in third year they might be expected to administer medicines. In addition, these students may be given yearly opportunities to simulate tasks in laboratories on mannequin patients. These activities vary from university to university. Engineering also implements similar WIL activities. For example, some Universities offer subjects entitled 'engineering practise' where students reflect before and after their 24 week internships. In this subject students are given opportunities to share their experiences with fellow students, this process is also assessed. Similarly, some programmes require students to submit a report of their experiences. However, these reflective experiences are only offered at some universities. In contrast, the WIL processes and procedures for nursing are well developed, integrated and administered, and thus provide a useful comparator against which those of the Con Mgt and engineering disciplines may be benchmarked.

The Study

The study aimed to identify ways that WIL could be improved by developing a reflection framework to facilitate and encourage reflective learning during students' industry and clinical placements. The population investigated was that of the Con Mgt and Nursing students and academics. Stage one of the project (reported here) involved a context study within these disciplines to propose enhancements of connections between what is taught at university and what is experienced during WIL. The methods used to investigate these issues and opportunities included a review of relevant professional competencies, focus group discussions and an online survey with students. This paper focuses on the WIL issues that arose in stage one from the discussions and survey feedback with students.

The Con Mgt and Nursing disciplines were studied because they both involve large numbers of students engaging in practical placements. Furthermore, the study provided an opportunity for the disciplines to learn from each other. The study has much in common with engineering as all these disciplines need to meet the competency requirements of their accrediting bodies.

Discussion

A framework for reflecting between theory and practise

A reflection framework was developed to encourage students to reflect on their practical experiences and their university tuition. In order to develop the reflection framework, professional competency requirements in Nursing and Con Mgt were reviewed to identify where the disciplines aligned. As already mentioned, the Nursing and Con Mgt disciplines are accredited by professional institutions which specify their clinical/industry experience requirements. The analysis of their professional requirements identified core similarities which, in turn, enabled a framework to be created to associate skills with WIL requirements. The core similarities included; communication, team communication, self evaluation, ethics, health and safety, legal knowledge, management skills, up-to-date knowledge of the field, and research and reporting skills.

These core skills are comparable to some of the attributes the engineering discipline requires of its graduates. These are defined by Engineers Australia and align with such requirements as an "ability to communicate effectively" (the communication core), and "understanding of professional and ethical responsibilities" (the ethics core) (Engineers Australia 2007cited in Palmer and Ferguson 2008, p.7). This demonstrates how the competency alignment created during this project could be adapted to the engineering disciplines and indeed, to the professional attributes in most disciplines.

This initial review of the Con Mgt and Nursing disciplines made it possible to identify where the skills of each discipline aligned with each other. However, the challenge of implementing the framework - how to encourage and facilitate students' reflection between theory and practise - still remained.

Encouraging reflective practise

Firstly, in order to encourage meta-cognitive links between practise and theory, it is necessary to understand how students make these connections. One way is through reflective practise, which is defined by Moon (2006) as a crucial professional activity that is intrinsic to learning. Reflective practise is not simply introspection, but a deliberate, orderly and structured intellectual activity (Bolton, 2001). It allows students to process their experiences, explore their understandings of what they are doing, why they are doing it and the impact it has on themselves and others (Boud 1999). Here, reflective practise relates to the way students make these links, as they evaluate their theoretical knowledge through reflection on their practical experiences.

Bain, Ballantyne, Packer and Mills (1999, p.52) further identify issues with using reflective journals to reflect on the teaching practise of educating students, such as motivation, and others such as level of reflection, stating that the "level of reflective analysis and sophistication in students journal writing varies widely, ranging from simple description…to highly sophisticated self dialogue".

To encourage students' 'self dialogue' as defined by Bain et al. (1999) a series of questions were devised, and used in conjunction with the competencies identified in the competency alignment, to prompt students and encourage them to engage in a deeper level of reflective practise. By reworking questions devised in a 2004 study on competencies entitled NURAPID (Williams and Sher, 2004), the project developed hierarchical questions for students to use when reflecting on their competencies (see the 'reflective questions table' below for reflecting on communication). Students could use these prompt questions to reflect after or during their WIL experiences to see how they have reached a particular level of competency they were claiming. This reflection process works to close the gap between the knowledge gained in the two domains of university and the workplace.

Table 1: Reflective questions

Competency – Communication for a claims dispute and resolution

Recalling and reflecting upon your experiences, consider which of the following statements best describes your competence in this skill:

1. I can contribute to or prepare and deliver a claims dispute on the construction process.
2. I can prepare and deliver a claims dispute on the construction process, to a construction audience, explaining the process clearly.
3. I can prepare and deliver a claims dispute on a complex scenario, to an unfamiliar audience, using an appropriate tone and style and dealing with any questions and avoiding digressions.
4. I can prepare and deliver a claims dispute on the construction process to a variety of audiences, encouraging further discussion and participation by people with alternative views (such as contractor, legal advisors). I am able to synthesise the discussions and sum up the various contributions in relation to the claims dispute. Finally in preparing the claims dispute, I take cognisance of issues such as gender, culture etc, choices being made in terms of language, method of communication and approach taken and I am able to judge the effectiveness of my construction dispute claim.

Indicate on the grid below your competence in this skill:	**Statement A**	**Statement B**	**Statement C**	**Statement D**

What evidence do you have to support your claim of competence? Where is this evidence located? Show on the grid below:

Evidence of competence	Location
Showcasing my claims dispute to my Industry placement supervisor	Industry placement Company
Reflection on my claims dispute:	

The students' answers to these reflection questions could then be easily assessed thereby enabling academic teachers to gain a stronger awareness of the types of student experiences within the workplace. Whilst the efficacy of these questions was not tested with students in this study, they provide an overview of the issues that concern them (as obtained from the qualitative data).

As stated, the study further endeavoured to identify other WIL issues identified by students. These issues were investigated using student focus groups which were conducted with seven student participants in each discipline (three in Nursing and four in Con Mgt) and an on-survey to which one hundred and ninety three participants were recruited (one hundred and fifty from Nursing and forty three from Con Mgt). The following discussion deals with the findings; how students manage the gap between theory and practise, and their preparedness for WIL placement.

Findings - Students WIL experiences

The data from the focus groups and on-line survey highlighted a range of positive experiences associated with WIL implementation and WIL experiences for students. It was found that the students valued their WIL placements, with students from both disciplines responding that these activities provided a positive learning experience. Moreover, most students felt that they were able to link their placement experiences to the theory that had previously learnt at university. An example of how students make these links between practise to theory is provided in the following quote:

> *"Yes, it's more just developing a whole big knowledge base. ... because a lot of that stuff really overlaps ... What you learn from this guy, you go to this course and you think 'oh hang on, we learned something about that', and that builds on ... Then you go in the real world and then you can draw from all of it, so yes it [theory] is relevant."*
>
> (Con Mgt Student Focus Group A, 2011)

Here, the process of connecting theory to practise is described by this student as an ongoing experience where knowledge is built upon over the years. The on-line surveys that were conducted in each discipline additionally confirmed this finding; it showed that students were able to integrate the various elements of their learning experiences. For example, when answering a question about how effectively their placement related to their university courses, more than 60% of the participants from both disciplines felt that their placement related to their courses 'very effectively' or 'effectively'. They felt that they had exploited opportunities to apply their theoretical knowledge during their placements regardless of their discipline. This raises question as to whether the theory – practise gap in WIL is a definite WIL issue from the students' perspective.

Responses differed between disciplines for a survey question asking how prepared students were for their placement. Nursing students felt better prepared to enter their placement, with 63% feeling 'prepared', 27% 'feeling 'well prepared', 7% feeling 'not prepared' and 3% feeling 'not at all prepared'. By comparison, Con Mgt students, 42% were feeling 'prepared', 15% were feeling 'well prepared', with 37% feeling 'not prepared' and 6% feeling 'not at all prepared'. This ill-preparedness of the Con Mgt students is concerning with a higher percentage of Con Mgt participants compared to Nursing feeling 'not prepared' or 'not at all prepared'. Being poorly prepared for placement is likely to compromise effective workplace learning as students may lack self-esteem, knowledge and feel unable to complete tasks. It is informative to contrast these results with the more positive feelings of the nursing students whose clinical placement was informed by the gradual development of their bed-side skills and exposure to simulation tasks whilst at university. This gives nursing students a more grounded approach and instils them with confidence. Indeed, a Con Mgt student noted that more

preparation whilst at university would better equip him and his peers for their placements as the following quote shows:

> *"They [academics] have got to understand that the real world doesn't work like university. I think there's a bit of a shortcoming in university that they don't teach you… to understand what goes on in the workplace. There should be more integration, kind of like an apprenticeship, when you're going to uni. There's none of that. You finish your course and that's it, you're on your own."*
>
> (Con Mgt Student Focus Group B, 2011)

This final finding indicates that simply requiring students to engage in their industry experience without preparation is a flawed strategy. Con Mgt disciplines need to embed industry placements into their programmes and incorporate students' experiences into their curriculum. The preparedness of nursing students demonstrates the effectiveness of this approach. Con Mgt and those engineering programmes with less WIL integration and assessment could thus benefit from the experiences of the nursing discipline in implementing and managing WIL.

Conclusion

This paper has explored some of the qualitative findings of an investigation of the facilitation of WIL in the Con Mgt and Nursing disciplines. Literature shows that Con Mgt and engineering students' work-based experiences are integral to deeper learning and that these experiences work to bridge the gap between theory and practise. The data highlighted that the gap between theory and practise is not perceived by the students in the study, with the participants stating that they readily make these links and further that what they learn in the workplace is aligned with their curricula. A key finding was the lack of preparedness for placements of Con Mgt students compared to their nursing counterparts. These findings may resonate with the experiences of some engineering students whose WIL experiences are closely aligned to Con Mgt. These disciplines would benefit from reviewing the approaches adopted by nursing, including developing students work-place skills before their placements. Implementing these findings in the Con Mgt programmes would help students feel better-prepared and confident to progress their studies and graduate as professionals.

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