Can ePortfolios assist students' learning in the work place? Exploring students' demonstration of their professional work experience through ePortfolios in the Construction Management and Nursing disciplines

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Abstract

E-portfolios have increasingly come to the fore as a means to enhance students' learning, and in particular, to enhance work integrated learning. Nevertheless, literature often warns of putting too much emphasis on these online technologies as the answer for improving students' learning experiences (Cotterill et al., 2005; Hung & Der-Thanq, 2001; Klenowski, Askew, & Carnell, 2006). Professional bodies in Australia require nursing and construction management university students to engage in practical/clinical placement experiences, such as working on construction sites and in clinical settings, as a requisite component of the undergraduate degree. This paper explores whether e-portfolios have a role to play in documenting and demonstrating the skills gained from work integrated learning experiences in relation to students' undergraduate studies.

A recently awarded Australian Learning and Teaching Council project entitled 'Facilitating work integrated learning through skills-enabled e-portfolios in the construction management and nursing disciplines' conducted at the University of Newcastle, Australia, is investigating work integrated learning and assessment in the two disciplines. Students in these disciplines are required to complete periods of industrial/clinical experience. The project's main aim is to develop a learning framework that will showcase to students how their university courses relate to each other and how the skills and competencies they acquire on campus and off campus (during work integrated learning experiences) can be integrated to enable them to graduate as qualified professionals. A component of the project aims to explore whether e-portfolio platforms and e-learning technologies can both facilitate and support students' learning and engagement with their work integrated learning.

Derived from the outcomes of the project's initial phase, this paper presents the development of a learning framework that encourages reflective learning during work based activities. It then explains how this framework can be incorporated in e-portfolios. The framework may be embedded into different e-portfolio platforms and used as a reflective tool assisting students to link the knowledge gained from their placement/industrial experiences with the theoretical concepts learnt at university (T Levett-Jones, Fahey, Parsons, & Mitchell, 2006). Potentially, students could use their e-portfolio following graduation to demonstrate the acquisition of professional skills relevant to their respective fields. Further, data gathered on students' responses to the use of e-portfolios will be taken into account to illustrate the advantages and disadvantages of using e-portfolios for work integrated learning.

Keywords: *e-portfolio, e-learning technologies, learning framework, work based learning, skills demonstration, construction discipline, nursing, professional skills, work integrated learning.*

Introduction

In this paper the preliminary outcomes of a recently awarded Australian Learning and Teaching Council (ALTC) grant to the University of Newcastle, Australia to undertake a context study in thedisciplines of construction management (Con Mgt) and nursing to investigate students' practical and clinical placement experiences, specifically work integrated learning (WIL) are discussed. The paper considers broad literature on the topic, and the project's developments to date. The project aims to facilitate links between students on campus learning and their WIL experiences. Furthermore, the project identifies e-portfolios as a way of guiding students in auditing, reflecting on and illustrating the skills they develop during their work integrated

learning. As the project is still in its initial stages, the purpose of this paper is to (a) review opportunities and issues presented by e-portfolios; (b) and to assess the potential for students to document and reflect on their placement experiences using e- portfolios; and (c) to examine whether e-portfolios have a role in enhancing student WIL and extending to the attainment of employability skills.

Project Aims

As stated, the main aim of the project is to create a 'learning framework' to assist students to make explicit connections between what is taught at university and WIL. The learning framework, derived from phase one of the project, will consist of a hierarchical framework of statements that map the competency requirements of relevant professional bodies to the learning outcomes of undergraduate programs.

Context

There are numerous differences in the ways Australian and United Kingdom (UK) universities respond to the requirements of their respective industries and accrediting professional institutions. In the UK there are separate degree programs in, for example, construction management and quantity surveying. Australian universities on the other hand generally offer one degree integrating both of these disciplines, sometimes including building surveying.

Generally UK construction management and quantity surveying degrees are of three years duration, whilst an Australian construction management and quantity surveying degree is generally four years. In the UK, universities offering these degrees are accredited by either the Chartered Institute of Building (CIOB) or the Royal Institute of Chartered Surveyors (RICS). In comparison, Australian construction management and quantity surveying degrees are accredited by numerous professional bodies in addition to the CIOB and RICS, including the Australian Institute of Building and the Australian Institute of Quantity Surveying. Several Australian universities also seek accreditation from the Australian Institute of Building Surveying, the Singapore Institute of Surveyors, the Malaysian Board of Quantity Surveyors and other professional bodies. These Australian degrees are amongst the most heavily accredited in the country.

In comparison, Nursing and midwifery programs are accredited by the Australian Nursing and Midwifery Council (ANMC). This is a relatively new development for the programs as prior to July 2010 each state or territory in Australia had a separate accreditation body. The ANMC has also developed, with industry consensus, competency standards that specify the knowledge, skills, attitudes, behaviors and values expected of novice practitioners (Andre 2009). These standards are not dissimilar to the standards of proficiency used in the United Kingdom (UK) by the Nursing and Midwifery Council for the same purpose (NMC, 2005).

The Australian Learning and Teaching Council

The Australian Learning and Teaching Council (ALTC) supports research into higher education Australia wide. A range of grants are awarded to universities to support learning and teaching initiatives. The ALTC's commitments are to 'create change in higher education institutions', 'raise the profile of teaching through innovative teaching procedures', 'develop good institutional practice' and 'benchmark learning and teaching processes with national and international knowledge' (ALTC, 2009 p.2). A similar funding body in the UK is the Higher Education Academy (HEA) and the Centre for Education in the Built Environment (CEBE).

Work integrated learning (WIL) and e-Portfolios

WIL is a term used to describe educational activities that integrate theoretical learning with its application in a workplace, profession, career or future employment (Stephen Billett, 2001; Patrick, 2009). WIL is becoming popular in Australian universities and is increasingly being integrated in a broad range of undergraduate programs. WIL experiences can be off or on campus, real or simulated, depending on the discipline area, but must involve clearly stated outcomes, assessment and should be consistent with quality teaching and learning (S. Billett, 2010). It has been recently promoted by the Higher Education system to encourage opportunities for students to apply the conceptual knowledge they gain from on campus learning to the 'real world' or practice/industry. For instance, research into Con Mgt education has shown that when students start employment they frequently find it difficult to relate theory to practice. However once they have been exposed to the workplace, they tend to modify their views and make these connections more explicitly (Williams, Sher, & Simmons, 2009). The higher education system for the Con Mgt and nursing disciplines in particular promotes WIL opportunities within their curricula. In addition, it is

mandated by accreditation bodies for students to engage in WIL, through work placement experiences during their undergraduate studies .

WIL and Nursing

Australian universities have varied ways to manage clinical placements (also termed clinical practicum) and nursing students' learning experiences can vary whilst they are on placement. For instance, at most universities, students undertake clinical placement in each year of their program for the purpose of building upon the knowledge and skills learnt on campus (Andre, 2010; Hallam et al., 2008). To encourage and support learning whilst on placements, universities use a range of processes, such as mentoring by experienced registered nurses, clinical skills practice and assessment and the completion of learning journals and portfolios (Cooke, Walker, Creedy, & Henderson, 2009). These portfolios are collections of evidence that can be used to reveal and stimulate learning and/or provide evidence of developing competence (Andre & Heartfield 2007, cited in Andre, 2010 p.2). This approach is designed to encourage students to reflect on their learning experiences whilst on placement (T. Levett-Jones & Bourgeois, 2007).

WIL and Construction Management

At the University of Newcastle, it is common for Con Mgt students to identify and arrange their own industrial placements (Sher & Sherratt, 2010). Further, students usually complete their placements during university vacations, but some study and work simultaneously (A. Mills & Ashford, 2004; Sher & Sherratt, 2010). Students may consult university staff about placement opportunities, but staff generally play no further part in placements until students submit evidence of completing their placement experiences (Sher & Sherratt, 2010). A range of documentation is called for in this regard, with some degree programs requiring students to submit formal reports while others simply require employers to confirm the duration of placements and the nature of the work students completed. Presentations and reports are required at some universities of students' practical experiences. Some programs offer construction site visits and/or have visitors from industry lecture students, whilst others offer simulated projects, where students take on roles in industry and 'act out' procedures, such as managing staff on site and the use of labs to test building materials (Ashford & Mills, 2006; Li & Randhawa, 2009; Maier, 2009).

E-Portfolio research and use in Australia

It is argued in the literature that online learning system platforms can be utilized as an effective medium to document and manage students learning experiences during WIL (J. N. Mills, Butcher, & Tilbrook, 2009; Skiba, 2005). The use of e-technologies for managing students learning has increasingly been studied and implemented by Australian universities, particularly that of e-portfolios to document students' learning experiences (Ayala, 2006; Heinrich, Bhattacharya, & Rayudu, 2007; Reardon & Hartley, 2007). Generally an e-portfolio is an online program with links to Web 2.0 tools to document learning, assessment and ultimately showcase skills, progress and reflections (Ivanova, 2008; Schwartz, 2006). According to the Business Industry and Higher Education Collaboration Council (BIHECC, 2007 p.41) "one of the greatest strengths of (an e-portfolio) is that it provides a structured and cost-effective means to encourage students to manage their own career planning and skill development".

The Australian e-portfolio project reported on current levels of e-portfolio practice at Australian universities (Hallam et al., 2008). Part of this study included a review of how industry professionals view the use of e-Portfolios for employability. One response from industry was that they found few students using e-portfolios for job applications to demonstrate their achievements. However, the researchers also stated that due to the timing of their study industry engagement in the research was limited (Hallam et al., 2008). Ultimately, this project aimed to work towards implementing a university wide e-portfolio system and highlighted the need for the creation of communities of practice to share e-portfolio knowledge as it emerges (Hallam et al., 2008). The e-portfolio project has also contributed towards the 'Australian flexible learning framework', an Australian Government initiative supporting research at Universities, TAFE and industry sectors on the use of e-Portfolios (Fergusson, 2009).

E-portfolios and Nursing

The use of e-portfolios across universities who offer nursing and midwifery is ad hoc in nature, being mainly used as parts of courses, or assessment items within a course (Hallam et al., 2008). Andre states that "Nurses, midwives and their associated professional and employer organisations are only just beginning to utilise social networking technologies as part of professional practice" (Andre, 2010 p.3). E-Portfolios used in nursing have been predominantly developed as an extension of traditional paper portfolio assessment

items which evolve over time as students reflect on their learning experiences (Andre, 2010). Anderson, Gardner, Rambotham and Tones (2009) reviewed the use of e- portfolios for nursing at one university in Queensland where the ANMC national competency standards were used as a framework for documenting students' reflective narratives of their skills and the related evidence of developing competence whilst on clinical placement. Anderson et al. (2009) identify two types of e-portfolios that universities typically use - these being the 'spinal column' and 'cake mixture' structure, the former being more focused on evidence and reflection linked to competency standards and for demonstration of professional abilities to future employees: and the latter having more focus on reflection and personal learning journeys as evidence of developing the personal qualities of nursing students. Anderson et al. (2009) analysed students' experiences of using e-portfolios to document their clinical skills and found that the ANMC competency statements were of benefit in shaping learning and reflecting in nursing and within e-portfolios. Similarly Garrett and Jackson (2006) reviewed the use of a mobile clinical e-portfolio for students whilst on placements in Canada. They found value in the use of this technology for placement situations to alleviate students' sense of isolation in remote locations. Andre (2010) similarly discusses the benefits of e-portfolios through their capacity to mediate information so that nursing students can learn how "prescribed learning activities relate to professional practice requirements" (Andre, 2010 p.5).

E-portfolios and Con Mgt

There is limited use of e-portfolios in the Con Mgt disciplines. However learning management systems (LMS) such as Blackboard are used regularly for such things as course administration, communicating to students and as a portal for downloading documents. Some universities employ LMS platforms to manage and administer students' WIL placements.

In regards to learning practical skills through e-portfolios, it is argued that generic e-portfolios provide little specific guidance on the skills (generic or discipline specific) that students need to develop. Here e-portfolios might be "seen by business and [Australian] universities to be a practical method for graduates to explain and provide examples of their employability skills" (BIHECC, 2007 p.4) but there is little evidence of their successful use in this regard in the Con Mgt and nursing domains. Indeed, recommendation 7 of the BIHECC (BIHECC, 2007 p.6) report encourages "more effective integration of employability skills in student e-portfolios". Anderson et al (Anderson et al., 2009 p.75) similarly conclude that further qualitative research on the use of e-portfolios is needed to investigate the use of e-Portfolios to meet the all stakeholder needs as the qualitative nature of 'content and the complexity of competence is not amendable to quantitative analysis'.

Students views on using e-Portfolios for WIL

Other studies of nursing students' views on the use of e-portfolios for clinical placement has shown limitations with their use for documenting reflections and skills achieved. Structures in the hospital setting can inhibit use, for instance the high clinical workload in hospitals does not always allow time for students to engage in professional reflection whist on placement (Garrett & Jackson, 2006). Furthermore the physicality of using mobile e-portfolios on placement is sometimes a barrier. Nursing students are not always permitted to use mobile devices on placements as there are concerns about interfering with technological patient monitoring equipment (Bogossian & Kellett, 2010). Other issues that can impede the use of e-portfolios include: time constraints, issues related to privacy and confidentiality of patient information, colleagues' views of the value of reflection, and a lack of motivation to use the platforms (Bogossian & Kellett, 2010). Similarly, some disadvantages of e- portfolios viewed by engineering students were that they found the technology frustrating and time consuming, and effective use depended ultimately on the students computer literacy skills and how much they perceived they could benefit from the platform (Smith & Mills, 2009).

This discussion suggests there is a need for an investigation into more effective ways for e-portfolios to be used to promote deeper WIL, to integrate professional employability skills for nursing and Con Mgt students. The project discussed in this paper aims to investigate the logistics of this through a review of Nursing and Con Mgt employability skills and embedding these into e-portfolios. To do this, a learning framework will be developed to support deeper learning which aims to help students link theory learnt from their curricula with their undergraduate clinical/industry experiences.

Discussion: Managing and assessing practice based learning in Con Mgt and nursing

Issues with WIL

A recent report on construction education in Australia found that those responsible for managing construction programs at universities expressed reservations about industrial experience and WIL (Williams et al., 2009). These reservations centre on the availability of placement opportunities for students during volatile economic times, and the resource implications of administering WIL (Williams et al., 2009). The report found that some academics argue that, given the choice, it is debatable whether students would engage in industrial placements if these were not required by their degree program (Williams et al., 2009). On the other hand, this same report has shown that Con Mgt students greatly value WIL with teamwork and collaborative learning whilst on placement emerging as drivers of effective learning.

Recent studies in engineering related to WIL, have highlighted further concerns about the lack of linkages between programs, industry experience and assessment. Richardson, Kaider, Henschke & Jackling (2009, p.338) discuss the issues of assessing WIL in engineering programs. 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 these contexts (such as learning 'informally'). Similarly, Hu, Oliver and Yusman (2009) identify a lack of research on what generic skills are required and should be gained from engineering industry placements. The authors reviewed current industry placements as an evaluation project, and identified the most important generic skills to be developed during WIL (Hu et al., 2009, p. p. 922). They evaluated these by investigating the skills developed, where the program is situated and the WIL experiences that support the development of these skills (Hu et al., 2009).

Some WIL issues identified in nursing pertain to how students make the necessary links between theory and practice when on placement. Researchers sometimes assert that despite the efforts of nursing theorists, educationalists and practitioners, the theory-practice gap continues to defy resolution (Rolfe, 1998). However, if the current model of viewing theory as informing and controlling practice were to give way to a mutually enhancing model in which theory is derived from practice, and in turn influences future learning, the so-called theory practice gap could be closed. Indeed, e-portfolios may encourage the closure of the so-called 'theory-practice' gap by an approximation of the two parts (Rolfe, 1998).

This similarity of WIL issues and opportunities highlighted between the two disciplines validates the need for this current project which aims to promote links between practice and theory for Nursing and Con Mgt students. The literature further raises the question as to how students currently link theory and practice. This is discussed below.

How do students link theory to practice? Reflection

Firstly, in order to promote links between practice and theory, it is necessary to understand how students make these connections. Reflective practice is a crucial professional activity. Reflection is intrinsic to learning. It is not simply introspection, but a deliberate, orderly and structured intellectual activity (Bolton, 2001). It allows students to process their experience, explore their understanding of what they are doing, why they are doing it and the impact it has on themselves and others (D. Boud, 1999). Engagement in reflective thinking requires students to critically review their practice with a view to refinement, improvement or change. Boud, Keogh and Walker (1985) similarly define reflection as 'returning to experience', 'attending to feelings' and 'evaluating experience', therefore defining a way for learners to return to the theoretical knowledge learnt, as they evaluate their experiences through reflection.

The topic of reflection through the use of portfolios is documented extensively in the nursing literature which states that this form of learning allows for a deeper learning experience (Cooke et al., 2009). This mode of learning lends itself to a reflexive approach which can result in "a more immediate, continuing, dynamic and subjective self awareness" (Finlay, 2002 p.533) from students. Reflexive learning therefore allows for a more holistic approach to learning; it further implies that students can make links between what is learnt in on campus to their practical experiences. These pedagogical practices on the role of reflexive learning are integral to establishing a foundation for the 'learning framework' posed in this study.

Project Developments: Mapping competencies – skill lists

To work towards the development of the learning framework that links theory/curricula with practice based skills, the initial phase of the project included an analysis of the competency statements of the accreditation bodies' skills requirement lists (AIB, AIQS, CIOB, and ANMC). Due to the diversities of these requirements, the competencies and graduate professional qualities of the two disciplines were mapped and compared. This allowed the research team to identify core areas/synergies and discipline specific competencies between the two disciplines. Generic synergies were identified within specific competency domains. These were: accurate data reporting, communication skills, management skills, research and reporting skills, self evaluation, health and safety knowledge, knowledge of ethics, knowledge of risk management, legal knowledge, up to date knowledge of the field - industry and institution changes. This competency mapping is still in progress and will build on another ALTC projects' findings which aims to publicise a nationally agreed competency assessment tool for nursing based upon the ANMC competency standards and for use Australia wide (Brown et al., 2009).

The above competency analysis will create a scaffold for the learning framework which will be developed from the qualitative stage of the research project.

Creating the learning framework

A recent study by Richarson, Kaider, Henschke & Jackling (2009) set out to develop a WIL assessment framework through interviews and surveys with educators, students and industry. The results from the data analysis formed the assessment framework, a criteria for creating relevant WIL assessment tools. The authors defined this framework as CCARDS (Contextual, Capability driven, Action-based learning, Relationship collaboration, Development, Student-centred). Similarly, Temple, Allan & Temple (2003) reviewed students' use of e-portfolios to document their learning in an undergraduate physical education course. They asked students to think about their competencies in relation to their previous experiences and to categorise them as "behaviours, knowledge, skills, and abilities that are job related" (Temple et al., 2003 p.5). The acronym STAR (Situation, Task, Action and Results) was used as a framework foundation for students to reflect on the skills learnt from assessment tasks and which were embedded in an e-portfolio platform.

Nevertheless these models are broad in their application to WIL. The qualitative data gathered in the current project with the exploration of staff and students' views on WIL in Con Mgt and nursing will contribute to the learning framework development to understand and encourage students to make links between their knowledge and the skills gained during WIL.

Using e-portfolios for WIL

Skills-enabled e-portfolio platforms have a section within the platform on 'competencies' - evidence based records where practical experiences may be documented and assessed. There are slightly different ways the competency sections can be viewed and assessed, such as 'assessor views', the range of competencies, or options where staff could create a WIL 'shopping trolley' of competencies (Barrett, 2004). Within the 'competencies' section of an e-portfolio there can be tags/links to artefacts, such as a document/video/audio of practical experiences uploaded to show students have achieved the relevant WIL competency (Barrett, 2004). Examiners can then validate this achievement with a comment or request for further work until this competency is completed. The competency statement in some platforms can be generic skills – for example, information and communication technology competence or communication skills; or they can be designed especially for a subject by the assessor in collaboration with the software provider/course provider (Clark & Eynon, 2009). For instance, the clinical portfolios in use by a number of nursing programs could be embedded into the competency section of the e-platform and students could indicate the skills they have achieved in the e-portfolio rather than the current paper based process. Nevertheless, the question remains: how can e-portfolios create reflexive opportunities for students so they can make links between theory and practice whilst on placement? From a functional perspective the e-portfolio architecture allows for summative assessment. For instance there is a range of tools for reflection. Some examples include "action plans, journals, blogs and reflective activities that provide prompts when uploading achievements to specific activities" (Andre 2010, p.4). Similarly e-portfolios can provide a section where examiners and/or peers can comment on these entries. Or if it is a final portfolio for submission, this information can be made public by the student for professionals to see work achieved through reflections (Andre, 2010). Over time e-portfolios can display students' progression and attainment of goals during their undergraduate years to use in their future careers (Andre, 2010). At the moment in Con Mgt there is a lack

of WIL assessment and therefore no official documentation of these experiences. However, this could be made possible with e-portfolios or online tools, with benefit to students, teachers and industry. This brief review of e-learning tools in relation to documenting WIL has shed some light on the benefits of these tools to promote deeper integrated learning experiences for nursing and Con Mgt students when they are engaged in practical experiences.

The literature reviewed in this paper raises the question as to how these e-portfolio practices can be advantageous to both the nursing and Con Mgt disciplines. This study reported on in this paper aims to fill this gap, through focus groups with staff and students and analyses of students' placement portfolio reflections to illustrate how students make these learning links between theory. Overall the learning framework developed from the research will allow for a stronger benchmark of e-portfolio use Australia wide to establish the needs of stakeholders in the two disciplines. This will allow practical placement experiences and the consequent attainment of employability skills to be further documented and understood from all these stakeholder perspectives.

Conclusion

This paper documents a current ALTC project investigating the facilitation of WIL in the Con Mgt and nursing disciplines. Related WIL literature revealed that students' work based experiences in both disciplines is integral to their learning. It is argued that both the Con Mgt and nursing disciplines could benefit from using e-learning technologies to document students' WIL, and especially for reflecting on WIL experiences to make links between theory and practice. As the project develops, the challenges presented by these technologies as primary facilitators of WIL will become clearer as will the logistics of implementing e-technologies and how the learning framework could be embedded into e-portfolio platforms. Further, qualitative domain specific data will highlight these issues and contribute to solutions for facilitating reflective WIL and the use of e-portfolios, so that students can make the necessary links between practice and theory and graduate as all-inclusive professionals in their fields.

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