Exploring students' demonstration of professional work integrated learning through e-portfolios

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Abstract— **E-portfolios have demonstrated a capacity to enhance students' learning, and in particular, to enhance work integrated learning (WIL). Professional bodies in Australia require construction management and nursing students to engage in practical/clinical placement experiences as a requisite component of the undergraduate degree. This paper considers the potential e-portfolios have in documenting the skills gained from WIL experiences.**

This paper presents the findings of the initial phase of a national study to 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 and used in assisting students to link the knowledge gained from their placement/industrial experiences with the theoretical concepts learnt at university. Data gathered on students' responses to the use of e-portfolios will be used to show the advantages and disadvantages of e-portfolios for this application.

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

I. 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 the disciplines of construction management (Con Mgt) and nursing to investigate students' practical and clinical placement experiences, specifically work integrated learning (WIL) are discussed.

A. Project Aims

The 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 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. This will be achieved by (a) reviewing opportunities offered by e-portfolios; (b) assess the potential for students to document and reflect on their placement experiences using e-portfolios; and (c) to examine the role e-portfolios have in enhancing student WIL and employability skills.

II. The current situation

In 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[1].

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[2].

III. 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[3]. 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. 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[4]. 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.

A. 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[5]. 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[6]. These portfolios are collections of evidence that can be used to reveal and stimulate learning and/or provide evidence of developing competence[7]. This approach is designed to encourage students to reflect on their learning experiences whilst on placement[8].

B. WIL and Construction Management

At the University of Newcastle, it is common for Con Mgt students to identify and arrange their own industrial placements[9]. Further, students usually complete their placements during university vacations, but some study and work simultaneously[10]. 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. 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[11].

C. 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[12]. 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[13]. 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[14]. According to the Business Industry and Higher Education Collaboration Council[15] "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[16]. Part of this study included a review of how industry professionals view the use of e-Portfolios for employability. 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[17].

D. E-portfolios and Nursing

The use of e-portfolios across universities who offer nursing and midwifery is ad hoc in nature, restricted to components of courses, or assessment items[18]. 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"[19]. E-Portfolios have been predominantly developed as an extension of traditional paper portfolio assessment items which assist students reflect on their learning. Anderson, Gardner, Rambotham and Tones[20] 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. The study identified two types of e-portfolios 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. Similarly Garrett and Jackson's[21] Canadian study of the application of mobile clinical e-portfolio for students whilst on placement found value in the use of this medium to alleviate students' sense of isolation in remote locations. Andre too supports the notion of e-portfolios' capacity to support students in relating prescribed learning activities to professional practice[22].

E. 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.

IV. Managing and assessing practice based learning

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"[23] 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[24] report encourages "more effective integration of employability skills in student e-portfolios". Anderson et al[25] 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'.

A. 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[26]. These reservations centre on the availability of placement opportunities for students during volatile economic times, and the resource implications of administering WIL. 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. 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.

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[27]. 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.

B. Linking theory to practice?

In order to promote links between practice and theory, it is necessary to understand how students make these connections. Reflective practice is a crucial attribute in professional practice and is intrinsic to learning. It is not simply introspection, but a deliberate, orderly and structured intellectual activity[28]. 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[29]. Engagement in reflective thinking requires students to critically review their practice with a view to refinement, improvement or change. Boud, Keogh and Walker[30] 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.

This mode of learning lends itself to a reflexive approach which can result in "a more immediate, continuing, dynamic and subjective self awareness"[31] from students allowing a more holistic approach to learning. These pedagogical practices on the role of reflexive learning are integral to the 'learning framework' of this study.

C. Mapping competencies

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 identification of core discipline specific competencies between the two disciplines. Generic synergies were identified:

- accurate data reporting

- communication skills, management skills

- currency of knowledge of the field (both industry and institution)

- health and safety knowledge

- knowledge of ethics

- knowledge of risk management

- legal knowledge

- research and reporting skills

- self evaluation

The above competencies form the learning framework providing the basis for the subsequent qualitative stage of the project.

D. Creating the learning framework

A recent study[32] 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[33] 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"[34]. 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.

E. 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[35]. 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. 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. 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". 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. Over time e-portfolios can display students' progression and attainment of goals during their undergraduate years to use in their future careers. 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.

V. Conclusion

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.

Literature reveals 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.

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