Electronic portfolios: Demonstrating student competence against external accreditation standards

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ePortfolio, portfolio, evidence, accreditation

Abstract The aim of this eScholar project was to evaluate the effectiveness of an electronic portfolio as a learning and professional development resource for clinical-based health professionals; in the first instance its use by nursing students was explored. Portfolios have been used in nursing practice as a repository of evidence against nursing standards since the 1990s. Early portfolios were paper based, whilst recent iterations have evolved into electronic portfolio formats. An iPortfolio, available to all students studying at Curtin University, was integrated into the clinical practice units within the Bachelor of Science (Nursing) program as a suitable adjunct to support student learning and assessment. A cross-sectional study was conducted in 2010, involving a convenience sample of 115 students in the first semester of their course. A questionnaire solicited data on demographics, information technology skills, iPortfolio use, its structure and function and impact on the learning process. The information technology skills required for iPortfolio use were met by the majority of the study population, despite some having irregular access to computers and the Internet. Some onerous iPortfolio functionalities limited the full application of the tool for demonstrating professional-based competencies; however its value was recognised by users. Using the tool supported learning processes, particularly reflective practice, gaining feedback and self-determination of learning capacity. The results suggest the iPortfolio has potential as an electronic learning and assessment tool. With minimal modifications, its affordances support the demonstration of a skill set and evidence display against Curtin's graduate attributes and the Australian Nursing and Midwifery Council's competencies.

Background

Context

Portfolios have been used by health professionals for some years. Within the School of Nursing and Midwifery they have been used in clinical units in undergraduate and postgraduate courses. Currently nursing and midwifery students are required to meet standards of practice established by an external professional accreditation body, the Australian Nursing and Midwifery Council (ANMC) Competency Standards (2005). The

portfolio provides the means for students to capture and demonstrate their competence against these standards.

In the past, a paper-based portfolio was used for the assessment of students' professional competencies. However, in 2010 an eScholars Program grant was awarded to enable the application of an electronic portfolio (developed for the broader Curtin community) into the undergraduate nursing curriculum. The first phase of the study involved adaptation of the Curtin iPortfolio template to meet the needs of nursing; specifically the incorporation of the ANMC competency standards was warranted. By semester two 2010, the iPortfolio was ready to be pilot tested with nursing students enrolled in the undergraduate nursing programme. In particular, its use as an effective tool for showcasing clinical competency was tested.

The study involved all first semester Bachelor of Science (Nursing) students at Curtin Bentley campus, who were enrolled in the first clinical unit of their course. The iPortfolio development was structured as an assessment item for the unit, making up 30% of the assessment load. Completion of the questionnaire associated with the study was not an aspect of the assessment and non-participation in the study did not impact on the students' progress in the unit.

Rationale

The use of the iPortfolio in the nursing programme is important because recording evidence against national standard competencies is a requirement of all students enrolled in clinical units. Further, developing an appropriate electronic tool to facilitate competency measurement is a strategic direction of contemporary professional practice. Success in this area would be a significant achievement for Curtin's School of Nursing and Midwifery. Hence, the development of a user friendly, on-line space that supports student learning and acts as a repository for evidence against the national competency standards and Curtin's graduate attributes is a goal of the clinical, and teaching and learning directorates in the School. In addition, educational learning objects are advancing rapidly and electronic learning and teaching resources becoming commonplace. As such the iPortfolio complies with advances made in portfolio development and supports the trend for digital tools in education and learning. It was also hoped that the iPortfolio would be embedded across the students' whole of course clinical learning journey and thus the early establishment of its structure, format and effectiveness essential for the successful integration of the iPortfolio into the course. Further, it was also anticipated that the iPortfolio would be used as a prototype for other courses requiring competency testing, including clinically based postgraduate and midwifery courses as well as having application to other health disciplines.

Literature review

A literature search was conducted to underpin the project. It began with the consultation of a wide range of journals, books, previous research papers and Government

documents. Searches were made using the terms 'ePortfolio', 'electronic portfolio', 'electronic learning support', 'digital teaching approaches' and 'iPortfolio'. The term iPortfolio is a brand name for the electronic portfolio developed at Curtin. The review was informed by a consideration of literature about eLearning and the use of electronic support for teaching with literature considered for this proposal accessed via various databases that included, MEDLINE, ProQuest, CINAHL, EMBASE, Allied and Complementary Medicine (AMED), Your Journals @ Ovid and Journals @ Ovid Full Text. The date parameters in most cases represented the limits of the search facilities within the respective databases, although in some cases search limits were drawn in the early 2000s given the relatively recent nature of the data available. Some of the literature discovered was arrived at in a serendipitous fashion during random journal searches or from contacts with nursing/professional colleagues. No specific country was excluded from the search, although much of the literature originates from Australia, the United Kingdom, the United States of America and New Zealand.

There are a number of papers and book chapters that address the principles of electronic learning (Alexander & Boud, 2001; Bogossian, Kellett & Mason, 2009; Herrington, 2009; Kearney & Schuck, 2006). These consider the value of electronic resources for learning and advocate electronic learning modalities over more traditional approaches to learning. Most report on pilot projects and consider the use of a range of electronic resources (e.g., iPhones and palm devices) for student learning.

The increasing interest in ePortfolios in the higher education sector culminated in the Australian ePortfolio Project. This project specifically focused on the use of ePortfolios by Australian university students and incorporated as chief investigating agencies, the Queensland University of Technology, University of New England, University of Wollongong and University of Melbourne (Australian ePortfolio Project, 2008). The purpose of the project was to study the current levels of ePortfolio practice in Australian higher education. The findings suggest a high level of interest in ePortfolios and that a number of courses were using or considering the use of ePortfolios to support student reflection. The key recommendations of the project support the engagement of government policy, technical standards, academic policy and learning and teaching strategies to advance the ePortfolio as a cutting edge, pedagogically sound educational resource. Another recommendation of the project supported the need for further research to identify the benefits of ePortfolios in the teaching environment.

Several studies addressed the use of ePortfolios for the assessment of various health professionals including: pharmacy students (Lee, Kinsella, Oliver, von Konsky & Parsons, 2010), occupational therapy students (Tan Torres, 2004), medical and nursing students (Garrett & Jackson, 2006; Nash & Sacre, 2009), nurses (Andre, 2010; Naude & Moynihan, 2004), nurse practitioners (Anderson, Gardner, Ramsbotham & Tones, 2009) and students studying a range of health and other disciplines (Oliver, von Konsky, Jones, Ferns & Tucker, 2009). A key feature of ePortfolios lies in its potential to enable the

gathering of evidence against clinical competency standards or clinical practice / fieldwork learning experiences (Australian ePortfolio Project, 2008). Researchers have attested to the value of ePortfolio for gathering evidence of a student's clinical competence (Anderson et al., 2009; Andre, 2010; Cook, Walker, Creedy & Henderson, 2009, Curtise, White & McKay, 2007; Lee et al., 2010).

Two studies undertaken at Curtin University were particularly relevant to the present project. The first by Oliver et al. (2009) reported on the wider issues of iPortfolio development at Curtin. Specifically, it outlined the university's drive to foster an iPortfolio culture and focused on the links between an iPortfolio and Curtin's graduate attributes. The second study of note investigated the impact of the iPortfolio use within a pharmacology course (Lee et al., 2010). This study used convenience sampling to gather quantitative and qualitative data about the potential capabilities of the iPortfolio to support student engagement, learning and reflection. The results were promising; students confirmed they were able to use the iPortfolio for storage of learning material and benefited from its use as an assessment tool. However, weaknesses in its ease of use and capacity for customisation were identified.

The literature pertaining to ePortfolios is growing, however much remains to be investigated. Emerging evidence highlights the benefits of ePortfolios for a variety of learning and assessment purposes. Significantly, literature related to the development of Curtin's iPortfolio system is available and offers insight into research foci and questionnaire design, as well as providing preliminary accounts of the value of integrating iPortfolios into courses of study. Other related studies recommend further investigation to determine the value of electronic portfolio in teaching and learning support.

Research Purpose

The aim of the study was to provide preliminary data on the effectiveness of the iPortfolio as a learning and professional development resource for use by nursing students. Specifically the objectives were to:

1. Identify how students learnt to use the iPortfolio
2. Evaluate the structure and function of the iPortfolio
3. Determine the impact of the iPortfolio on students' learning processes.

Project Methodology

Methodology

A cross-sectional study conducted July to November, 2010 utilised survey methodology to assess iPortfolio users opinions. A convenience sample of pre-registration nursing students enrolled in a unit of study, specifically structured to incorporate the iPortfolio as a learning and assessment tool, were eligible to participate in the study. All students (n = 115) were invited to complete the survey; 80% (n = 92) responded. Ethical approval was granted by the University Human Research Ethics Committee.

Survey development was informed by a literature review, consultation with the information technology team at Curtin University who were responsible for designing the iPortfolio template and the Curtin based study of Lee et al. (2010). The survey comprised three parts. Section 1 focused on participants' characteristics, such as personal attributes as well as study status variables. Section 2 contained items to assess information technology (IT) related attributes including a four item self-confidence with information technology scale (Cronbach alpha = 0.93), regularity of use of IT (1 item) and access to technology for iPortfolio use (1 item). Section 3 contained items specific to the iPortfolio, including how students learnt to use it, its structure and function (Cronbach alpha = 0.81) and the impact its use had on their generalised learning processes (Cronbach alpha = 0.89) and learning processes that assisted their professional development (Cronbach alpha = 0.81). All items in Sections 2 and 3 were measured using a Likert scale of 1 "strongly disagree" to 4 "strongly agree".

Students were introduced to the iPortfolio in their first tutorial and each student was offered guidance about the process to access their iPortfolio site. Each subsequent tutorial was used to encourage students to develop their iPortfolio and several other opportunities were provided to assist students with the technology, these included: individual tutor instruction, a sample nursing related iPortfolio, group tutorial sessions, information on the unit Blackboard site, specific educational activities provided by the Learning Centre (a central student learning support agency within the university) and focused instructional lectures on iPortfolio use.

Surveys were completed immediately post iPortfolio use of 12 week duration and data analysed using the Statistical Package for the Social Sciences, version 17.0 (SPSS, 2008). Figure 1 summarises the research process used in this eScholar project.

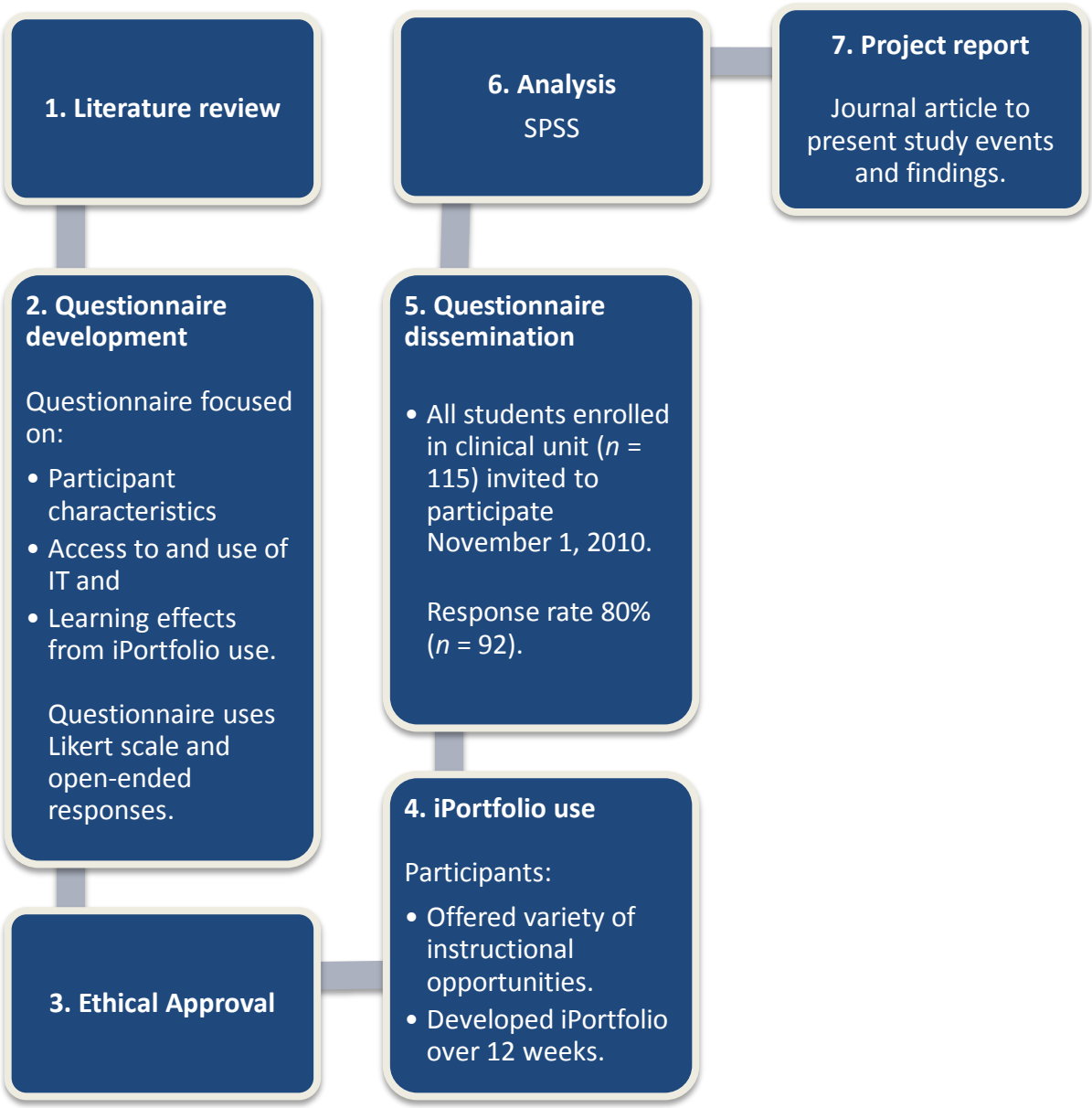

Figure 1: Research process summary. The study involved seven key phases, commencing with a literature review to inform the study and questionnaire and culminating in the final stage of project write up.

Findings

The 92 participants were primarily female (90.2%), average age 25 years (*SD* = 8), range 17 to 62 (see Table 1). The majority were domestic students (84.8%) and English was the primary language (70.7%). Most were fulltime students (88%) with almost 70% working whilst they studied.

Table 1: Participant characteristics

Participant factor		*n*	%
Gender (*n* = 92)	Female	83	90.2
	Male	9	9.8
Age (*n* = 89)	≤ 20 years	37	41.6
	21-40 years	46	51.7
	≥ 41 years	6	6.7
Primary language (*n* = 92)	English	65	70.7
	Asian	17	18.5
	African	6	6.5
	European	4	4.3
Residency location (*n* = 92)	Domestic	78	84.8
	International	14	15.2
Study status (*n* = 92)	Fulltime	81	88
	Part-time	11	12
Employment status (*n* = 91)	Fulltime	5	5.5
	Part-time	58	63.7
	Not in paid work	12	13.2
	Home duties	16	17.6

IT skills

Eighty eight per cent of participants rated their confidence to use information technology as adequate or higher (*M* = 3.33, *SD* = .75). In particular, 90.3% (*n* = 83) felt they had sufficient levels of IT skills and Internet skills, whilst 85.9% (*n* = 83) reported feeling confident using social networking programs. For most students (85.8%, *n* = 79) access to technology to run the iPortfolio was not problematic and more than three quarters (80.5%, *n* = 74) accessed the Internet regularly. However, as can be seen from Table 2, a small number of students considered their confidence and skills lacking, some were irregular users of the Internet and others encountered difficulties accessing the technology to use the iPortfolio.

Table 2: IT characteristics

IT factor	Positive *n* (%)	Negative *n* (%)
Confidence	81 (88)	11 (12)
Access to technology	79 (85.9)	13 (14.1)
Regular use of Internet	74 (80.5)	18 (19.5)

Learning to use the iPortfolio

Students learnt how to use the iPortfolio through different instructional strategies, although the most common was trial and error (80.4%, $n = 74$), followed by instruction available on the Curtin web site (69.6%, $n = 64$) and the unit Blackboard site (61.9%, $n = 57$), whilst less than half gained assistance from a university staff member (43.5%, $n = 40$) or a fellow student (42.4%, $n = 39$) and only a quarter accessed any Curtin specific iPortfolio course (27.2%, $n = 25$). Despite the use of various strategies, a third of students (33.7%, $n = 30$) indicated they were still unsure how to use the iPortfolio.

Structure and function

The structural and functional features of the iPortfolio were rated marginally above average ($M = 2.67$, $SD = .69$), suggesting its ease of use was problematic for some. As can be seen by Figure 2 the feature considered easiest to use was the ability to maintain privacy and security of evidence within the iPortfolio ($M = 3.00$, $SD = .59$), whilst the least favoured featured was the ability to tag evidence against the ANMC competencies ($M = 2.62$, $SD = .71$).

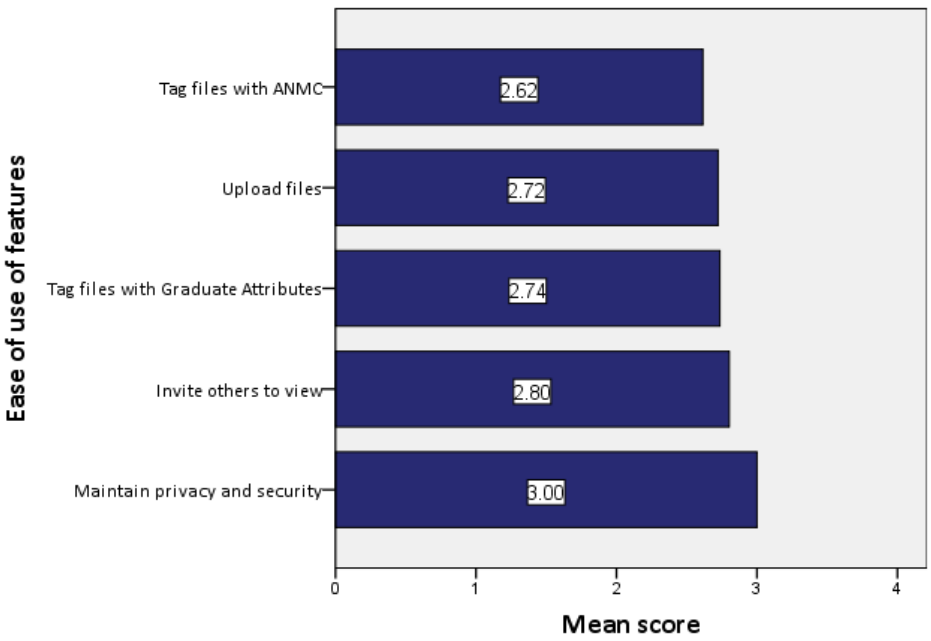

Figure 2: Structural and functional features of the iPortfolio, assessed using a Likert scale of 1 "strongly disagree" to 4 "strongly agree".

Impact on student learning

The impact the iPortfolio had on learning was assessed from the perspective of learning processes and professional related learning. Figures 3 and 4 indicate the use of iPortfolio was favoured more for its value in supporting professional-related learning behaviours than those related to learning processes.

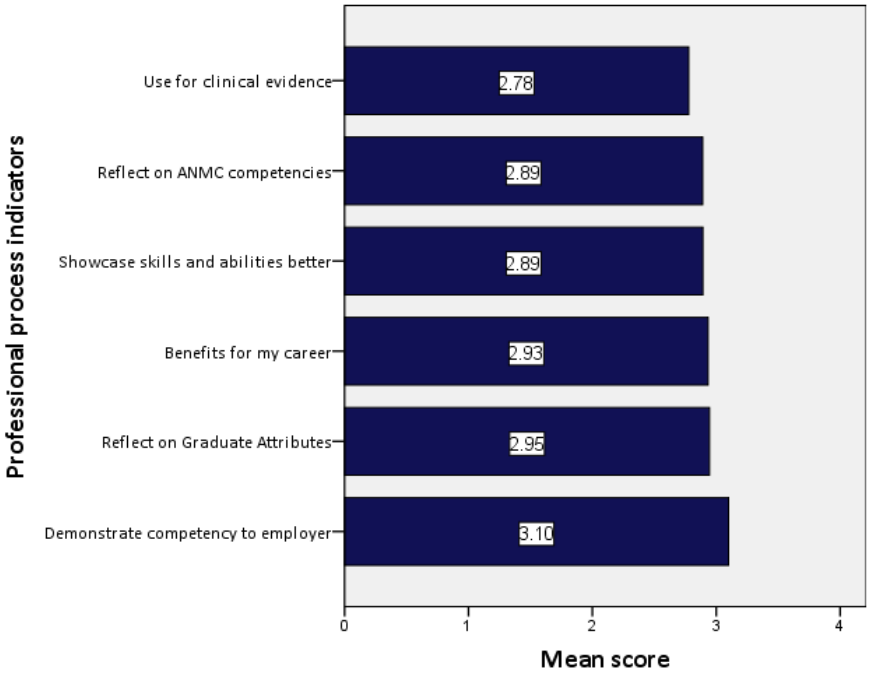

Figure 3: Impact of iPortfolio on student learning process, assessed using a Likert scale of 1 “strongly disagree” to 4 “strongly agree”.

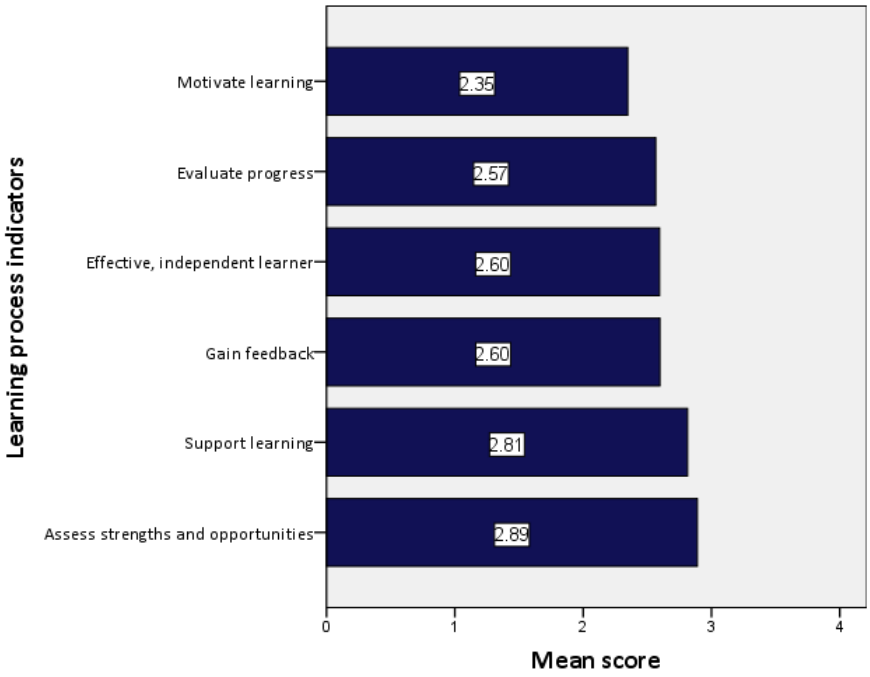

Figure 4: Impact of iPortfolio on professional related learning process, assessed using a Likert scale of 1 “strongly disagree” to 4 “strongly agree”.

Most students (75.8%, *n* = 69) were appreciative of the use of the iPortfolio as a tool to assist their learning and its ability to support self-assessment of strengths and weaknesses. In particular, more than half of the students felt it helped them to evaluate their progress in the unit and become an independent learner (55.4%, *n* = 51), and gain more feedback on their learning (58.7%, *n* = 54); whilst results showed a positive trend, over half of the students (58.7%, *n* = 54) felt the iPortfolio did not motivate them to learn.

With regards to professional-related learning, students rated the iPortfolio highly as an effective tool for the support of reflection on Curtin's graduate attributes (82.6%, *n* = 76) and the ANMC competencies (80.5%, *n* = 74), whilst approximately three quarters of the students indicated the iPortfolio was useful for showcasing their skills and abilities (77.1%, *n* = 71) and clinical evidence (70.6%, *n* = 65). In particular, 78.3% (*n* = 72) could see its application for career purposes.

Overall comments

Although some advantageous effects associated with the inclusion of the iPortfolio as a teaching and learning tool into a unit of study were apparent, there were mixed responses to the overall acceptance of its use. Over a third of the student cohort did not consider it a positive learning experience (39.1%, *n* = 36), finding the time spent to develop the iPortfolio was hard to manage (36.9%, *n* = 34), whilst 38% (*n* = 35) indicated a preference for a paper-based portfolio. Some of the factors that may have influenced less favourable opinions of the iPortfolio are shown in Figure 5. The most problematic aspect of the iPortfolio was its poor performance when uploading evidence against the ANMC and graduate attributes. Typically students commented it was "difficult when uploading documents other than pdfs", "difficult cutting and pasting from word" and "evidence didn't always appear, had to reload which took a lot of time." However, some students attributed the uploading problems to inaccessibility of a scanner, rather than problems with the functionality of the iPortfolio itself. Users reported finding the iPortfolio to be overly complex, finding it "very convoluted" and "not user friendly;" even going as far as stating that "it seems like very outdated technology."

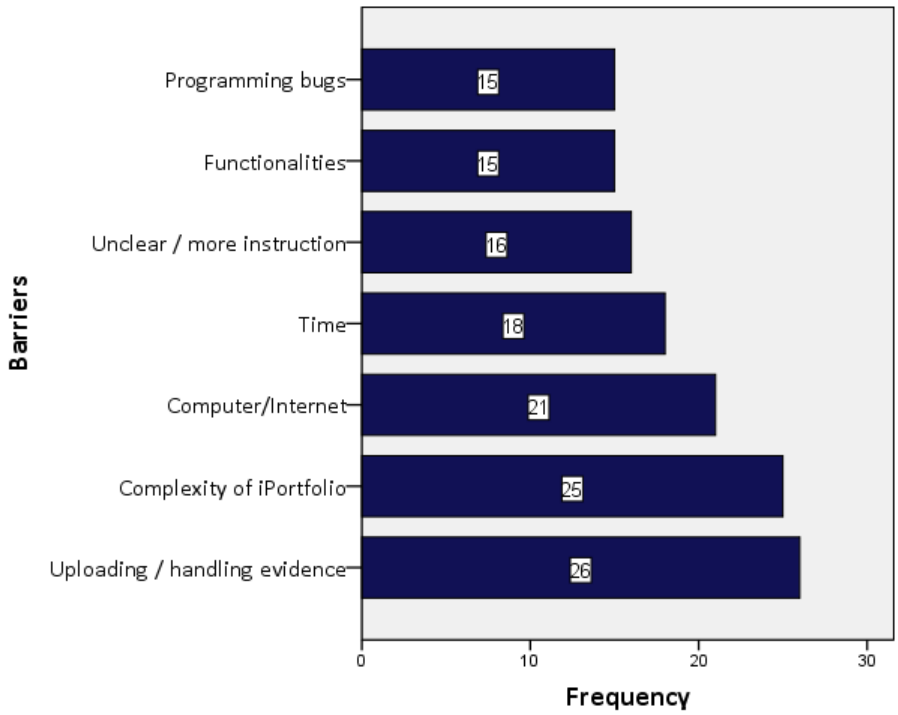

Figure 5: Barriers affecting the use of the iPortfolio as identified by users

Figure 6 illustrates four main categories of improvements to the iPortfolio suggested by student users. Given many students reported finding the system complex, it was not surprising to find that the primary need identified by users was the requirement for more classroom/laboratory preparation and a step by step guide to assist in its use.

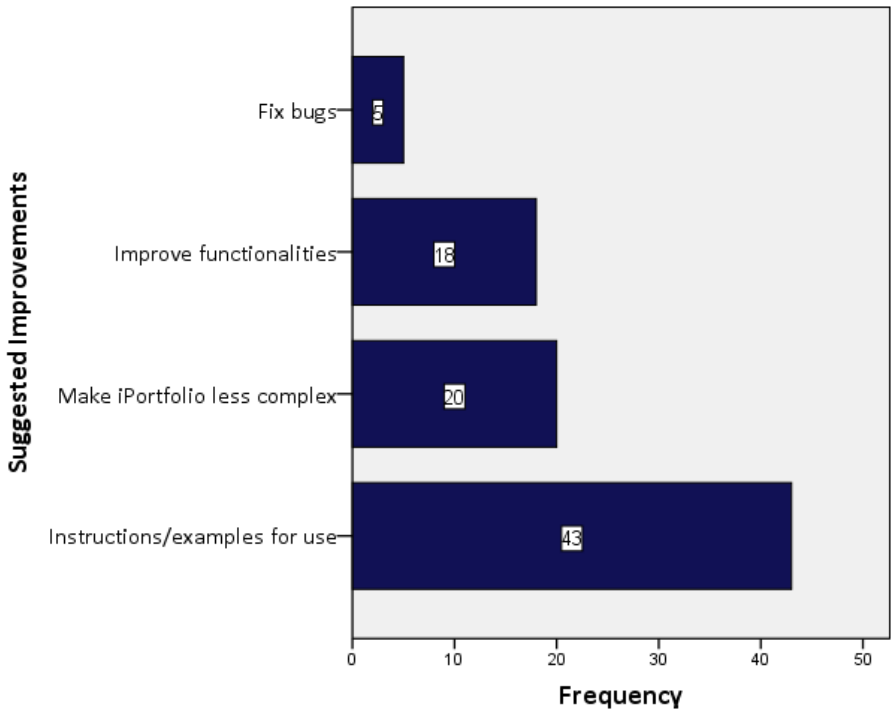

Figure 6: Suggested key improvements to the iPortfolio system identified by users

Conclusion

When considering what worked well, what could have been done differently and what implications this study has for the future of iPortfolio use at Curtin and especially the Curtin nursing program, the results offer a number of conclusions. It is clear that the use of an iPortfolio is at the neophyte stage of development in the nursing course and further investigation is warranted with current students in this study as they progress through their course, as well as new to course students who may benefit from what was learnt in this project.

IT skills

The study results demonstrated that the majority of students (88%) felt confident to use information technology, including computers and the Internet. This compares favourably with the findings from the study by Lee and colleagues (2010), which showed that 91% of students had "good" or "very good" IT skills. The mean age of study participants was 25, and given young adults are particularly conversant with computers and IT platforms this finding is not surprising. However, the integration of the iPortfolio platform in a course of study presents challenges for a small number of students who report being less confident in using computers and IT literacy; these may well be middle-aged students, international students, those with limited access to computers, related technology and the Internet. Qualitative responses confirmed the lack of access to a computer and/or the Internet operated as barriers to using the iPortfolio. Whilst students struggling with the computer or technology may be in the minority, nevertheless, if the iPortfolio is to remain a principal learning and assessment feature of the nursing course, this shortfall will need to be considered and further investigation is warranted to clarify the issue.

Learning to use the iPortfolio

Not all students knew intuitively how to use the iPortfolio format. Lee et al. (2010) found that initially 47% reported feeling uncertain, negative or anxious initially, but by the end of the semester only 5% felt the same. However, in the present study a third (33.7%) of the students indicated they were still unsure how to use the iPortfolio. Some of the reticence may be attributed to perceived deficiencies in the structural and functional configuration of the iPortfolio platform, discussed later, and/or inadequate levels of related-instructional support.

A number of strategies were available for students to gain understanding on how to use the iPortfolio. Of the unit specific strategies not all occurred as planned, for example, an instructional lecture was only able to be timetabled late in the semester and so proved less valuable than anticipated; whilst weekly tutorials focusing on the iPortfolio were hampered by IT issues in some tutorial rooms. Consequently, most students (80.4%) employed a trial and error approach to learn how to use the iPortfolio. Furthermore, given the newness of the iPortfolio tool the skill set of some tutors may have been less than adequate. The Joint Information Systems Committee (2008) stressed the importance

of investing in staff training and support if iPortfolios are to be effectively embedded in the curriculum. The Australian ePortfolio project has developed a user toolkit, which comprises a series of ePortfolio concept guides, including ones for students and staff. Staff opinions were not assessed formally in the eScholar project, although anecdotal evidence from staff indicates developing increased familiarity not only with setting up an iPortfolio but also how it operates within the unit is necessary. Further, the student users identified the need for step by step guides and greater classroom preparation. Curtise et al. (2007) indicate that web based support and instruction can be useful and in the eScholar project most students did employ supplementary web based resources accompanying the Curtin iPortfolio (69.6%) and unit Blackboard site (61.9%). In light of these findings, thinking still needs to be accorded towards optimising strategies designed towards facilitating students' understanding of the iPortfolio.

Structure and function

Despite participants reporting a degree of comfort when using computers, the Internet and other social networking programs the mean ratings related to the ease of the iPortfolio use were not as high, to the extent that some felt the platform was unnecessarily complex. This is consistent with evidence from the study undertaken by Lee et al. (2010) which used the Curtin iPortfolio tool, where it was found participants felt the iPortfolio could benefit from being made more user friendly.

Most respondents accepted that the iPortfolio was safe and secure (M = 3.00) and relatively easy to invite others to view (M = 2.80), less so was its ability to tag files against the graduate attributes (M = 2.74) and ANMC competency standards (M = 2.62). Moreover, uploading documents as evidence was more difficult than expected (M = 2.72). The uploading of documents is critical for demonstrating and assessing graduate attributes and employability skills required in externally accredited health professional courses. Andre (2009) saw the linking of evidence to professional standards as a key portfolio requirement and this was also one of the primary aims of Gardner's e-Portfolio (as cited in Anderson et al., 2009), where nurse practitioner students identified their competency standards as a key anchor for shaping their learning, developing reflection and understanding their scope of practice.

The uploading of evidence appears complicated by several factors; some technological issues and resource availability were noted. Students expressed frustration that the iPortfolio lacked basic copying and pasting capabilities common in Microsoft Office applications. Further, students reported that programming bugs in the system led to long delays in uploading evidence. The attachment of evidence was also more arduous for students who did not have ready access to scanners. The availability of such equipment in computing laboratories may be something that requires consideration at a school and university level if the portfolio can truly be used to display professional practice based evidence.

In particular, the linking of evidence to the ANMC competencies was not streamlined, despite it being a primary objective for the iPortfolio set up for this project. The lack of an established tab to the ANMC competencies on the iPortfolio tool complicated the processes involved in demonstrating how students meet an external set of criteria. This limitation is an issue not only for Nursing, but any other professional groups that are required to meet an external set of criteria. This may explain the high number of students who felt the time developing the iPortfolio was difficult to manage (36.9%) and they viewed the experience negatively (39.1%), which perhaps accounts for why more than a third of the participants (38%) preferred a paper-based portfolio. The negativity attached to the experience is in contrast to that found by Lee et al. (2010) where a larger number of students (83%) reported feeling enthusiastic and positive about the iPortfolio as a learning experience. However, the participants in this study were third year students and although artefacts were collected they were not required to be tagged against professional criteria. Accordingly, it is recommended that the tagging functionality of the software be considered further and the iPortfolio structure rectified in future versions of the tool.

Impact on student learning

The greatest perceived advantages of the iPortfolio were related principally to functionalities enhancing specific professional development and showcasing achievements to potential employers. The findings related to professional learning are consistent with others who recognise the value ePortfolios have in capturing information for potential employers (Anderson, 2009; Andre, 2009; Lee et al., 2010; Naude & Moynihan, 2004).

In particular, the iPortfolio supported reflective practice against both the ANMC competencies (80.5%) and graduate attributes (82.6%). Results pertaining to reflective practice are consistent with that reported in the Lee et al. study (2010), which also used the Curtin iPortfolio. The Australian ePortfolio Project (2009) considers reflection a constructivist practice that supports student engagement with learning and the advancement of lifelong learning abilities and argues ePortfolios are well placed to augment this skill.

It seems that despite difficulties encountered with uploading and tagging evidence against graduate attributes and ANMC competencies, the students saw the potential of the iPortfolio for professional performance. Students made a number of comments in this regard, suggesting for instance that it allowed them to, "create my study evidence which will be useful in the future" and "record study progress throughout the course." It is worth noting that the study participants were new-to-course students and thus it could be assumed that as students progress through the course and continue to develop their iPortfolio the career benefits of the iPortfolio will become clearer. This aspect is worthy of further research.

The impact of the iPortfolio on learning processes trended favourably, although it was noticed that this was not as strong as its ability to support profession-specific learning. Participants reported that the iPortfolio allowed them to assess their strengths and opportunities (M = 2.89) and offered learning experiences to help them learn (M = 2.81). Central to this was the capacity of the iPortfolio to be shared with tutors and fellow students for feedback. Students commented that they liked receiving "encouragement from my tutor and fellow students" and "feedback and comments from other people. " In this regard the iPortfolio replicates features of other social networking sites. Students were able to invite their tutor or fellow students to see and to comment on any one page, or the whole iPortfolio. While the "My Ratings" tab allowed students to rate the quality of the evidence offered against various parts of other students' iPortfolio. The ease of use for providing feedback also meant that marking the iPortfolio and returning comments to student was quick and simple and could be offered at any point during the course of the semester. The capacity of the iPortfolio to motivate learning was less pronounced (M = 2.35) and although a little higher, its impact on supporting students to evaluate their own learning (M = 2.57) and become independent in their learning (M = 2.60) was considered similarly disengaging. Furthermore, a quarter of the students reported the process of learning was not facilitated by the iPortfolio. These negativities may well be a reflection of some of the structural and functional features of the present iPortfolio format. In part, it may also be accounted for by the novice nature of participants; new-to-university students require considerably more directed learning than required in later parts of the course and based on the constructivist perspective, scaffolding and modelling is an important part of early learning processes. It would be interesting to repeat this study with students at later points in their course. Overall, despite some reservations surrounding its benefits, a large proportion of the respondents (75.8%) recognised the value of the iPortfolio as a learning and assessment tool.

Implications

There are implications for the development of the iPortfolio within the nursing programme at Curtin University, particularly the redesign of tutorial sessions offered early in the study programme to specifically address the students' capacity to build and develop their iPortfolio. This could be facilitated in a computer laboratory and should be led by unit tutors who understand the iPortfolio and who are involved in iPortfolio development and assessment. There should also be a focused iPortfolio lecture offered early in the semester and wider access to iPortfolio development resources offered by the university.

Significantly, it is imperative for the success of the iPortfolio project that stronger linkages/tab facilities to the ANMC competencies are inbuilt into the iPortfolio. The iPortfolio's capacity to support linkages between the ANMC competencies and the students' learning and assessment activities, and clinical experiences sits at the heart of any portfolio and as such investigation to determine how the iPortfolio facilitates this is crucial. Determining the iPortfolio's usefulness and value in the education of health

professionals is critical. Therefore, future studies should be planned to elicit the impact of the iPortfolio at different stages of the learning journey on a diverse range of health professional students.

In summary the iPortfolio as a tool provides an electronic repository for students to collect evidence against Curtin graduate attributes and the ANMC competencies. Whilst the latter proved more difficult for some students, at least the process of linking student activities, learning and evidence to the ANMC competencies was commenced. The value of the iPortfolio was recognised and allowed students to communicate with each other and with tutors about the quality of their evidence, learning processes and assessments within the units. Principally, difficulties in the iPortfolio use arose due to limitations in some of its functionalities and structural framework and these must be addressed with future iterations of the tool to maximise its value.

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