

Students' experience toward ePortfolios as a reflective assessment tool in a dual mode indigenous business course

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ePortfolios as a
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assessment
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Received 24 June 2015
Revised 16 March 2016
Accepted 12 July 2016

Abstract

Purpose – The purpose of this paper is to investigate students' experiences of, and attitudes on, the use of technology – in the form of ePortfolio – as an assessment tool. The authors seek to determine whether ePortfolios aid students in facilitating critical reflection on their learning and academic skill development. The authors also determine whether ePortfolios can provide an alternative assessment tool to the traditional assessment practices in the accounting and business discipline.

Design/methodology/approach – This study surveys students enrolled in an indigenous business course using questions on the usability of ePortfolios, technical support and effectiveness in critical reflection and learning. Formal evaluations were included to capture students' self-reflections on their ePortfolio experience. The analysis included analysis of variance, *t*-tests, correlations and hierarchical regression.

Findings – Results indicated that students show positive attitudes toward ePortfolios even after controlling for possible confounding variables such as previous experience, attitudes and accessibility. The authors also found that ePortfolios are a useful vehicle for enhancing students' learning and understanding of indigenous knowledge in a business context. They were also found to facilitate students' ability to critically reflect, engage in learning and develop their academic skills.

Research limitations/implications – The findings of this study could benefit those working in higher education, particularly accounting academics in Australian universities, and the adaptation of ePortfolios in a blended learning environment, and contribute to pedagogical knowledge regarding indigenous business issues. Academics could design the curriculum of the accounting courses within the commerce programme that addresses programme learning objectives to align with graduate employability outcomes.

Practical implications – This study provides a foundation for improving the design and assessment of written communication activities in accounting courses to achieve employability skills outcomes commensurate with university accreditation criteria. This could be achieved with the development of a community of practice developed by the professional accounting bodies in collaboration with Australian universities.

Originality/value – The research is not wholly new, although the use of ePortfolios in accounting education is not widely reported and, therefore, may be of interest to those in advancing the accounting education agenda. In light of the recent call by Australian professional accounting bodies, ePortfolios can provide accounting graduates the non-technical or soft skills such as communication, interpersonal and critical thinking.

Keywords Active learning assessment, e-Portfolios, Indigenous business education

Paper type Research paper

1. Introduction

The concept of "portfolio" has been around for centuries, and broadly defined, a portfolio is a collection of evidence that demonstrates a person's abilities and lifelong learning. As



opposed to an artist's portfolio that showcases a person's best work only, or a financial portfolio which contains a record of transactions and investment holdings, an educational portfolio contains work that a learner has accumulated, reflected, selected and presented to show growth and change over time (Barrett and Carney, 2005). Thus, the significant element of an educational portfolio is the reflection on the individual work presented as well as an overall reflection on the narrative that the portfolio conveys. Kimball (2005) argues that reflection is what supports the entire pedagogy of portfolios. The other two significant aspects of portfolios is that they measure learning and development over time (Barrett, 2000; Challis, 2005) and that the learning takes place in the process of constructing a portfolio, not in the end product (Smith and Tillema, 2003).

1.1 The electronic portfolio

Recent advances in Web-based technologies as well as the availability of higher-capacity memory storage at lower costs have led to opportunities for electronic portfolios (ePortfolios) to support student learning in a variety of contexts (Tosh *et al.*, 2006). The area of educational technology has been strengthened by the evolving digital tools for distributive communication and exchange of Web 2.0 in which the use of ePortfolios has heralded the emerging emphasis on user-generated content (Bass and Eynon, 2009). In the current climate of multimedia self-authoring, ePortfolios have become a dynamic and accessible educational medium that appears to be ideal for meeting the educational needs of the social networking generation (Clark and Eynon, 2009). In addition, the interest in ePortfolios has progressed in the last two decades as a result of pedagogical changes in higher education which have focused on the use of technology in teaching, learning and assessment. In fact, Yancey (2009) argues that ePortfolios are re-shaping the landscape of higher education through changes in how students learn and how faculty teach (Clark and Eynon, 2009).

An ePortfolio is an electronic version of a paper-based portfolio or a digital collection of text, video, images and sound, which can be used to support a variety of pedagogical and evaluation purposes (Abrami and Barrett, 2005). The advantages of ePortfolios over the print-based portfolios include the ability to store, organise and reorder contents quickly and easily; can integrate student course work and can be used for collaboration, self-organisation, planning and presentation skills (Bhattacharya and Hartnett, 2007). Whether print-based or digital, the portfolio process is identified by five stages:

- (1) collection stage where students and teachers work together to identify artefacts that represent growth and success;
- (2) selection stage, where the best artefacts that demonstrate the achievement of learning goals are chosen;
- (3) reflection stage allows students to think about each section in the portfolio;
- (4) evaluation stage, crucial in the process, as students assess their pre-set goals and other achievements, growth and progress, at the same time identifying gaps in their development; and
- (5) celebration stage, where portfolios are shared with peers and others (Abrami and Barrett, 2005; QESN-RECIT, 2004).

Furthermore, Abrami and Barrett (2005) suggest that ePortfolios can be designed as "process" portfolios meant to encourage improvement, growth and commitment to life-long learning; "showcase" portfolios which illustrate and demonstrate competencies and achievements; and "assessment" portfolios that focus on formative or summative evaluation of learning.

Smith and Tillema (2003) propose four types of portfolios: a “dossier portfolio” used for job selection and promotion, a “training portfolio” used for learning and development, a “reflective portfolio” where the author is in charge of its content and a “personal development portfolio” aimed at self-directed education and growth. Hallam *et al.*'s (2012) research findings support this view, particularly in terms of the potential to help students become reflective learners who are conscious of their personal and professional strengths and weaknesses, as well as to make their existing and developing skills more explicit. Similarly, Butler (2010, p. 113) identifies “three main uses for ePortfolios: for students while studying, for graduates while moving into or through the workforce and for institutions for programme assessment or accreditation purposes” (Lorenzo and Ittleson, 2005). Bhattacharya and Hartnett (2007) inform that portfolio types depend on the purpose for which they were developed and list assessment, employment, learning and teaching portfolios as examples.

1.2 Pedagogical frameworks

ePortfolio is not only seen as a new technology but also as a pedagogy (Gerbic *et al.*, 2009) by shifting the way instructions happens, from teacher-directed to student-directed methods. The underlying pedagogical characteristic of ePortfolios is the constructivism method which emphasises learning by experience and self-discovery, and encourages inquiry, problem solving and collaborative methods of learning (Meeus *et al.*, 2006; Abrami and Barrett, 2005). Student engagement with learning literature shows that when faced with choices on how to learn course matter, students prefer gaining knowledge through a deeper understanding of the subject, rather than just information acquisition (Ramsden, 2003; Marton and Säljö, 1984; Kuh *et al.*, 2005; Entwistle, 1998). ePortfolios enable the creation of connections between learning experiences that happen in various contexts and environments, thus supporting deep learning (Tosh *et al.*, 2006).

In their learning landscape framework, Tosh *et al.* (2006) show how ePortfolios have the ability to link the overlapping domains of academic, workplace and community through the three key elements of framework: reflection, communication and sharing. Figure 1 illustrates the learning landscape framework and the role played by ePortfolios in the transfer and re-use of skills, knowledge and experiences through reflective thinking and self-assessment (Tosh *et al.*, 2006).

In this framework, ePortfolios are a technological tool designed to enhance a learner-focused approach, promoting a holistic rather than fragmented view of learning, and are not meant to define the learning landscape. An overarching pedagogical framework that incorporates both technology and education is the community of inquiry (CoI) framework of Garrison *et al.* (2001) which shows how the use of technology can create and sustain deep meaningful learning and reflection. Similar to the learning landscape framework of Tosh *et al.* (2006), the CoI framework presented in Figure 2 also has three elements: cognitive, teaching and social presence. However, the central focus of the CoI is on the educational experience of the learner which is being transformed by how technology interacts with the three components of the framework.

Within the context of our paper, ePortfolio as a technological instrument has the potential to affect all three elements of CoI and, ultimately, influence the learning experience. Starting with the teaching presence, ePortfolio represents a new, challenging, collaborative learning activity and environment reflected in the design area; a different way of communicating between and among students and teachers manifested in the facilitation area and an innovative approach to share and introduce information from different sources in a variety of forms, expressed in the direct instruction area (Garrison and Akyol, 2009). Within the

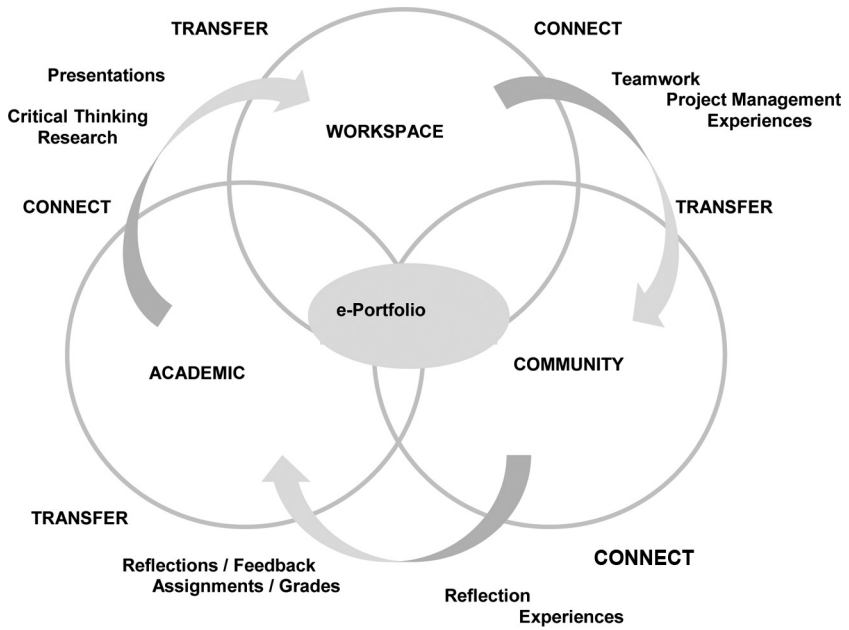


Figure 1.
Learning landscape
framework

Source: Adapted from Tosh *et al.* (2006)

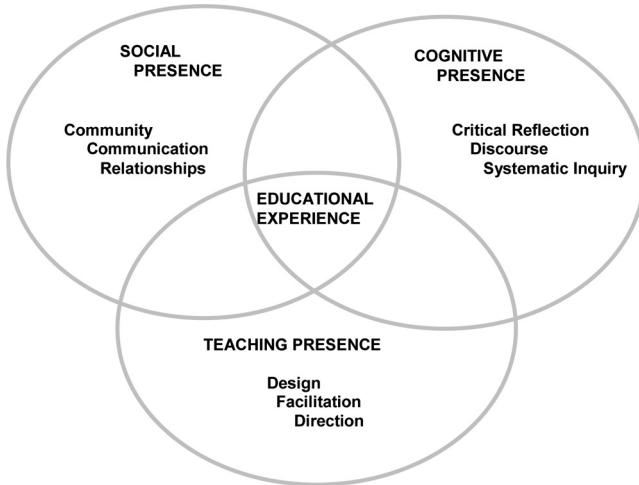


Figure 2.
Community of
inquiry framework

Source: Adapted from Garrison *et al.* (2001)

cognitive presence, ePortfolio is the ideal mechanism for critical reflection, being one of its key characteristics; allows the thoughts of reflection to be recorded as an online discourse; and through the process of collecting artefacts, develops a process of systematic inquiry. Similarly, in the social presence, ePortfolio encourages students to identify with the course community through a shared social identity; develops interpersonal relationships through formal and informal interaction with peers; and by sharing its artefacts, resources and reflections, allows students to communicate the journey of their learning experience with others.

1.3 Assessment using ePortfolios

In this paper, we focus on ePortfolio as an assessment tool, an alternative to the traditional examination practices of written tests, essays, case studies and multiple-choice questions. In particular, we investigate the students' view whether digital assessment in the form of ePortfolio was considered an innovative and appropriate technological tool for the course. ePortfolios have been successfully used as an assessment tool in a number of disciplines including arts, humanities and medicine. The Hallam report (Hallam *et al.*, 2010) finds the two principal uses of ePortfolios to be in the areas of collecting examples of the evidence of learning and summative assessment.

Wade *et al.* (2005) confirm that ePortfolios involve students in the evaluation and assessment process as they continually revisit and revise their portfolios. Through the construction of an ePortfolio, Wall *et al.* (2006) show that students can better understand the assessment that they are supposed to produce. Cambridge (2001) states that ePortfolios also help contextualise failure; they can show the actions to correct failure and what the students have learned from the experience.

Mason *et al.* (2004) provide evidence from student feedback and course evaluations that ePortfolios can be an effective method of assessment in a postgraduate education course. Students perceived the process of creating an ePortfolio to be hard; however, they could see how all individual learning objectives linked together the whole course and the pedagogical benefits of this assessment method. Analysing the undergraduate students' perceptions, attitudes and behaviour when using ePortfolios in learning and assessment, Lopez-Fernandez and Rodriguez-Illera (2009) find that students valued knowing the assessment criteria and the self-management of their learning; however, they failed to recognise ePortfolios as a better and more transparent learning system. In the medicine discipline, Del Duca and Duque (2006) show that ePortfolios are a useful tool to motivate and stimulate students' self-reflection, and encourage a positive change in attitudes toward aging and geriatric medicine.

Harper *et al.* (2007) investigates the adoption of ePortfolios across multiple faculties with a diverse range of applications. They find that ePortfolio as a compulsory but not graded assessment in the law and accounting discipline helps students understand the most effective learning practices and is a useful tool in the employment application process. Similarly, Woodley and Sims (2011) explore students' perception on the use of ePortfolio as an assessment task in a second-year business course. They find that although students see the advantages of having an ePortfolio to showcase their employability, most perceive the task to be a technically difficult process. Nevertheless, Hallam *et al.* (2010) and Hind *et al.* (2007) report that the use of ePortfolio influences students by raising awareness of the eLearning technology, reflective learning and professional/industry skills.

This review of literature has highlighted the lack of research on the use of ePortfolios in the social sciences, particularly the area of commerce and business. Currently, a joint innovation and development project for the Office for Learning and

Teaching is investigating the use of ePortfolios as an assessment tool in accounting subjects at various universities in Australia (Salzman and Holt, 2015; Oliver *et al.*, 2011; Oliver, 2011). Ranging from financial accounting, auditing and corporate accounting at Deakin Business School to the accounting capstone course at Macquarie University, the project details case studies where ePortfolios have been used to assess critical thinking and problem-solving graduate outcomes. The preliminary project report (Salzman and Holt, 2015) presents the challenges faced by academics and institutions in adopting ePortfolios in a business context, citing lack of institutional strategy and knowledge of ePortfolios, among others.

To be considered a meaningful mechanism for the development of knowledge, ePortfolios must focus on reflection and the assessment of this reflection (Zubizarreta, 2004; Bhattacharya and Hartnett, 2007). Thus, the research questions investigated in this paper concentrate on students' perceptions and attitudes on ePortfolios as a technological tool, and whether this form of assessment has contributed to enhance their level of knowledge and understanding. Specifically, the research questions are stated as follows:

RQ1. What are students' pre-existing attitudes toward ePortfolios at the start of the semester?

This research question seeks to determine whether students were exposed to ePortfolios prior to the course, their knowledge of ePortfolios and their attitude toward such learning tools.

RQ2. What were the determinants of students' existing attitudes?

This research question investigates whether age, gender, different nationality, knowledge and experience of Web-based reflective tools, and the type of degree had any influence on the students' existing attitudes toward ePortfolios.

RQ3. Having used ePortfolios as part of the course assessment requirements, has the experience changed their existing attitudes?

One of the main purposes of the paper is addressed through this research question, which seeks to answer the students' experiences and attitudes on the use of technology in an assessment and whether ePortfolios aid their learning of the indigenous business content after having used in the course.

RQ4. Was ePortfolios a useful vehicle for facilitating critical reflection on one's learning and for compiling and demonstrating the evidence of learning and skill development?

The benefit of ePortfolio as an assessment tool that improves learning and student engagement with the course material is investigated through this research question.

2. Context

The study is focused on the application of ePortfolios in a dual-mode course within the business school at an Australian university. As this is the first time ePortfolios are considered in learning and teaching in the department, the study is considered experimental research. The ePortfolio platform used is the Blackboard Electronic Portfolio System within the university-wide learning management system (LMS). The students act as the curator of the design and management of the portfolio; they can add digital artefacts and share the portfolio within the LMS. The portfolio can be exported and used outside of the LMS, and it can be linked to the Grade Centre. Schroeder *et al.* (2010) show that LMS provides the main

platform for the integration of learning activities and resources in higher education. An LMS such as Blackboard can provide notice rooms, document repositories, discussion forums and blogs in a secure institution-based format (Klobas and McGill, 2010; Schroeder *et al.*, 2010). Research conducted on the various LMS platforms used in higher education shows that in 2004, 20 Australian universities were using Web CT™ as their primary LMS, and 15 were using Blackboard™ (Byrnes and Ellis, 2004), while more recently, most universities in Australia use either Moodle™ or Blackboard™ (Smithers, 2009).

The students serve as portfolio owners with control over the material, design and membership of their portfolio. The system supports a variety of file types and allows for multiple artefacts to be stored in the Content Collection, folder-based file storage for search, reuse and archive. The portfolio can be exported as HTML pages and thus, viewed outside of Blackboard. As Blackboard is widely used as an electronic learning environment by many institutions, the similarity and excellent integration between the portfolio solution and the course environment promotes rapid adoption and means less work for the faculty and staff. The restriction on commenting (viewers can only comment on the portfolio as a whole) and the unavailability of the reports of learning activities during portfolio development highlight one of the disadvantages of this solution.

3. Methodology

The study uses a mixed method approach (Creswell, 2003) involving surveys with participating students undertaking a dual “intensive” mode course titled Engaging with Aboriginal and Torres Strait Islander Business Communities. Lime Survey is used as the basis for developing the survey to gather feedback from students at the beginning of the semester and again, at the end of the semester. The survey, adapted from Collis and Moonen’s 4 E model and the CICTO framework, is used to gather students’ feedback at the beginning and the completion of the semester (Gosper *et al.*, 2007). The online Lime Survey link was sent to all participating students enrolled in the course. The survey contained two phases. During the semester, both cohorts had access to the same material through a Blackboard course website. Students were given information in a course profile which outlined their assessments for the semester. For one piece of assessment, they were asked to prepare an ePortfolio containing critical reflective writing based on questions raised in seminars and supplementary readings. Although no formal training sessions on how to construct an ePortfolio was offered, students had access to user manuals, instructional videos and other useful information on the Blackboard course website.

3.1 Phase 1: Pre-survey (RQ1 and RQ2)

Phase 1 involved a pre-survey conducted at the beginning of the semester where students attending classes on-campus and those enrolled online were asked demographic questions and background information in terms of their pre-existing experience, knowledge and attitude toward ePortfolios prior to undertaking the course. Demographic questions included categorically measured personal attributes of age, gender and nationality/cultural background as well as enrolment information of the degree undertaken and the enrolment mode (online or on-campus). Students were asked to provide additional comments regarding their pre-existing knowledge, experience and attitudes toward using an ePortfolio as an assessment tool for facilitating critical reflection on their learning.

RQ1 and RQ2 seek to investigate a student’s pre-existing knowledge, experience and attitudes of students toward ePortfolios and the determinants of these pre-existing attributes, respectively. Both research questions were measured using six-point Likert scale questions from “1” extremely low to “6” extremely high, such as “To what extent is your

knowledge of ePortfolios” and “What is your existing attitude towards using ePortfolios as an aid to learning and skill development”.

3.2 Phase 2: Post-survey (RQ3 and RQ4)

Phase 2 involved obtaining feedback from students at the end of the semester using a post-survey relating to their actual experience using ePortfolios, the support provided by the university staff or other ways, and the effectiveness of the tool to learn and engage in the course. The post-survey included questions relating to students’ experience on the accessibility and usability of ePortfolios, the technical support provided and its technological effectiveness in their learning. Students were asked to provide additional comments regarding their experience in using an ePortfolio tool for facilitating critical reflection on their learning.

RQ3 seeks to investigate whether students’ attitude toward ePortfolios changed after using the new digital technology. Technology was measured using agreement to a number of statements on a six-point Likert scale ranging from “1” strongly disagree to “6” strongly agree. These included statements such as “ePortfolios were easy to access” and “ePortfolio was easy to use”. Support was posed as one question with 6 sub-choices with students having the option to select different types of support they used, such as “online instructions”, “videos”, “university staff”, “blended learning advisors”, “no support, I just worked it out myself” or “other”. Students were then asked to provide “comments on your past experiences using Web-based reflective tools (e.g. course code, ePortfolio software, accessibility, helpfulness, usability and support)” and “comment on your overall experiences using ePortfolios and whether it was what you expected, and whether or not ePortfolios enhanced your ability to learning the content in the course”.

RQ4 investigates whether ePortfolios were useful vehicles for facilitating critical reflection on students’ learning and for compiling and demonstrating the evidence of learning and skill development. Helpfulness was measured using agreement to a number of statements on a six-point Likert scale ranging from “1” strongly disagree to “6” strongly agree. These included statements such as “ePortfolios helped me integrate and make connections between things I have learned”, “ePortfolios helped me to reflect and make comparisons between my own culture and indigenous culture”, “ePortfolio tool was helpful in compiling the reflective journals” and “Technical issues influenced my learning and skills development”.

4. Results

4.1 Phase 1: Pre-existing experience, knowledge and attitudes (RQ1)

In terms of demographics (Table I), the sample represented a relatively young demographic with a quarter of the participants aged under 21 years and almost two-thirds under 30 years of age. Chi-square analysis showed that there were significantly more females than males ($\chi^2 = 3.69; p < 0.001$). Interestingly, there was no significant difference in the proportion of males and females on-campus compared to the online cohort.

In terms of prior knowledge and experience using ePortfolios, 89.1 per cent of the participants reporting low knowledge with 43.5 per cent reporting extremely low knowledge (see Table II). Of the 10.9 per cent reporting high knowledge, only one reported extremely high knowledge. Similarly, 80.4 per cent of the participants reported low experience with Web-based reflective tools for assessment, with almost half of the participants reporting extremely low experience. Despite having low knowledge and experience, attitudes and expectations toward ePortfolios as an aid to learning were relatively high. Three quarters of

Demographic characteristic	Total sample (n = 46)	(%)	ePortfolios as a reflective assessment tool
341			
<i>Age group</i>			
17-21	12	26.1	
22-30	16	34.8	
31-35	7	15.2	
36-45	10	21.7	
46-55	0	0	
56 and above	1	2.2	
<i>Gender</i>			
Female	36	78.3	
Male	10	21.7	
<i>Enrolment status</i>			
On-campus	25	54.3	
Online	19	41.3	
Both	2	4.3	
<i>Degree type</i>			
Commerce	12	26.1	
Business	22	47.8	
Social Sciences	6	13	
Education	2	4.3	
Other	4	8.7	
<i>Nationality</i>			
Australian	22	47.8	
<i>Country of birth or culture you identify with</i>			
Aboriginal	1	2.2	
Pacific Islands	2	4.3	
Chinese	5	10.9	
Indian	1	2.2	
Middle Eastern	1	2.2	
UK	1	2.2	
Europe	7	15.2	
Other	6	13	

Table I.
Demographic data of the sample

Pre-survey statements	1	2	3	4	5	6	Mean (SD)
To what extent have you already <i>experienced</i> ePortfolio as a reflective assessment tool?	47.8	8.7	23.9	6.5	8.7	4.3	2.33 (1.55)
To what extent is your existing <i>knowledge</i> of ePortfolios?	43.5	15.2	30.4	4.3	4.3	2.2	2.17 (1.29)
What is your existing <i>attitude</i> towards using ePortfolios as an aid to learning and skill development?	4.3	8.7	10.9	32.6	37.0	6.5	4.09 (1.23)

Table II.
Existing experience, knowledge and attitudes toward ePortfolios for the pre-survey

Note: Likert scale: "1" extremely low to "6" extremely high

the participants reported high expectations. Of the 23.9 per cent reporting low attitude, only two participants reported extremely low attitude.

4.2 Phase 1: Determinants of students' pre-existing attitudes (RQ2)

Parametric tests such as *t*-tests, analysis of variance (ANOVA) and correlations were run to compare the independent variables of the demographic (Table I) and background data on

the students' attitudes toward the use of ePortfolios (Table II) as an assessment tool. Examinations of demographic differences (Table I) in experience and knowledge (Table II) were also undertaken and were found to be significant.

ANOVA found significant age group (Table I) differences both in experience with Web-based reflective tools for assessment and in the knowledge of ePortfolios (Table II). Post-hoc analysis found that the 22-30-year-old age group was significantly more likely than either the under 21 or the 31 and over age groups to have experienced Web-based reflective tools and to have had more knowledge of ePortfolios. No significant difference between age groups was found for attitude toward using ePortfolios as an aid to learning, indicating that despite the age difference in experience and knowledge, all three age groups had similar attitudes.

Comparison was undertaken between males and females on the background questions. As there were only 10 males, caution should be used in interpretation of the results. Comparisons of males and females using independent groups *t*-tests, found significant gender differences in experience of Web-based reflective tools for assessment ($t = 2.93$; $p = 1.005$)[1]. Males were significantly more likely than females to have experienced Web-based reflective tools. Non-Australian students had higher attitudes toward using ePortfolios than Australian students. Over 60 per cent of non-Australian students had higher attitude scores of five or six out of six, compared to only 28 per cent of Australian students. Independent group *t*-tests found marginally non-significant differences between commerce and business students in attitude toward using ePortfolios. Interestingly, commerce students had significantly more positive attitudes than business students did. Gender and enrolment status were not found to be determinants of student attitudes toward using ePortfolios.

Correlational analysis was undertaken to look at the relationship between Experience, Knowledge and Attitudes (Table III). Experience and Knowledge were moderately to strongly positively correlated with Experience being associated with more Knowledge ($r = 0.65$; $p < 0.001$). However, both Experience and Knowledge were not significantly related to Attitudes. The results indicated that neither previous Experience nor Knowledge were determinants of existing Attitudes toward ePortfolios as an aid to learning.

Interestingly, students provided mixed comments with almost half of the respondents revealing that they had "no knowledge of ePortfolios" and "were looking forward to learning about this to further enhance my development". The others commented that they "had some previous experience" with two of these students claiming that this was only in a job seeking capacity.

4.3 Phase 2: Post survey change in existing attitudes (RQ3)

Twenty-seven participants provided usable responses to the follow-up survey, which represented 58.7 per cent of the 46 participants that provided useable responses to the pre-survey. Although existing attitudes were already relatively high in the pre-survey data, results (shown in Table IV) show that attitudes were higher in the post-survey.

Table III.
Summary of
intercorrelations,
means and standard
deviations for the
relationship between
demographics and
experience,
knowledge and
attitudes toward
ePortfolios

No.	Variables	1	2	3	Mean (SD)
1	Experience	–			2.33 (1.55)
2	Knowledge	0.65***	–		2.17 (1.29)
3	Attitude	0.06	0.11	–	4.09 (1.23)

Notes: Significance at *** $p < 0.01$; $n = 46$

Pre-survey results showed 23.9 per cent of the participants with low attitudes and 76.1 per cent having high attitudes. Post-survey results showed only 11.1 per cent with low attitudes and 88.9 per cent having high attitudes. Compared to the 6.5 per cent of the pre-survey participants that had extremely high attitudes, almost twice as many had extremely high attitudes. A comparison of mean scores using a *t*-test analysis showed that the mean attitudes for the post-survey were not significantly higher than in the pre-survey. However, failure to find a significant mean difference appeared to be due to changing levels of the degree of attitudes, specifically the higher proportion of “high” ratings compared to the “somewhat high” ratings for the post-survey group.

The next step was to assess whether students’ experience using the new digital technology influenced their attitude toward ePortfolios to engage in their learning and academic skills (Table V). Technology was measured using three statements where students were asked to rate their agreement on how successful they were in accessing ePortfolios, how easy it was to use and how much support they received. Success in accessing the ePortfolio tool was measured by a single item variable (see Table V). Almost two-thirds of the students agreed that they were successful in accessing ePortfolios, with 14.8 per cent being very successful. A significant proportion (37.0 per cent) disagreed and reported being unsuccessful in accessing ePortfolios, although less than 8 per cent reported being very or somewhat unsuccessful.

Usability of the ePortfolio tool was measured by the following statements: “ePortfolio was generally easy to use” was not as strong, with 55.6 per cent of students agreeing and 44.4 per cent disagreeing.

Participants were asked to rate their agreement to the statement “they received sufficient support/guidance on how to use the ePortfolio tool”. Four of the participants disagreed strongly and reported not using any support. In the order of frequency, support was provided for online instructions, such as a user manual (74.1 per cent), “how-to” videos (70.4 per cent) and individual guidance by the Convenor (44.4 per cent).

4.4 Phase 2: ePortfolios for facilitating critical reflection on students’ learning (RQ4)

Table VI provides the descriptive statistics of students’ overall ratings of ePortfolios, as measured by the students’ ratings of Helpfulness, as a facilitator of critical reflection on

Survey participants	1	2	3	4	5	6	Mean (SD)
Pre-survey (<i>n</i> = 46)	4.3	8.7	10.9	32.6	37.0	6.5	4.09 (1.23)
Post-survey (<i>n</i> = 27)	3.7	0.0	7.4	55.6	22.2	11.1	4.26 (1.02)

Note: Likert scale: “1” extremely low to “6” extremely high

Table IV.
Descriptive statistics – pre- and post-survey attitudes toward ePortfolios (RQ3)

Technology variables	1	2	3	4	5	6	Mean (SD)
Accessibility	3.7	3.7	29.6	33.3	14.8	14.8	3.96 (1.26)
Usability	11.1	11.1	22.2	14.8	29.6	11.1	3.74 (1.56)
Support	3.7	11.1	0.0	44.4	25.9	14.8	4.22 (1.28)

Note: Likert scale: “1” strongly disagree to “6” strongly agree

Table V.
Agreement to statements on the influence of technology on students’ learning

one’s learning and for compiling and demonstrating evidence of learning and skill development.

Helpfulness of the ePortfolio tool was measured using six statements (Table VI) using a six-point Likert scale where “1” is strongly disagree and “6” is strongly agree. The statements are: to what extent do you agree or disagree that experience using ePortfolios helped students’ learning, attitude, collating their work, integrating and making connections between things they had learned, facilitating critical reflection of it impeded their learning and skill development for the assessment. Almost all agreed that the tool helped them learn the course content (81 per cent), enhance their attitude (85 per cent), collate their work for submission as course assessment (93 per cent), and integrate and make connections between things learned during the course along with critically reflecting on what they learned during the course (92.6 per cent). With regards to students’ experience using ePortfolios, two-thirds of the students agreed that the new technology impedes their learning and academic skills (67 per cent).

Some students found the experience problematic as reflected in their comments such as:

The Web-based reflective tools were not at all effective in aiding with my studies. I found that I was restricted in my researching phase, as I had to constantly update my ePortfolio.

The ePortfolio was hard to use. I liked the idea of the google sites version of the ePortfolio but unless you have a paid version of Gmail, you cannot access it.

The other students had a more positive experience as reflected in the following comments:

ePortfolios were not what I expected but I still really enjoyed it. I definitely think they should be used more widely within university and they were a refreshing change from other simple assessment modes. I think if I knew how to use them better I would have done a better job, but now I have the skills for next time.

From completing the reflective journal, I enjoyed using the ePortfolio as it illustrated how I understood the content, my cultural experience and made the reflection journal interesting and attractive to read and watch videos. As a result of having limited history towards using an ePortfolio, I did not know what will be expected.

Table VI.
Agreement to statements on helpfulness of ePortfolios as a facilitator of critical learning and skill development

Critical reflection statements	1	2	3	4	5	6	Mean (SD)
The experience of using ePortfolios helped my learning	3.7	3.7	11.1	22.2	44.4	14.8	4.44 (1.22)
The experience of using ePortfolios helped my attitude	3.7	0.0	11.1	18.5	48.1	18.5	4.63 (1.15)
The experience of using ePortfolios helped me collate my work for submission of my assessment	0.0	3.7	3.7	40.7	37.0	14.8	4.56 (0.93)
The experience of using ePortfolios helped me integrate and make connections between things I have learned	3.7	0.0	7.4	25.9	48.1	14.8	4.59 (1.08)
The experience of using ePortfolios helped me facilitate a critical reflection on my learning	0.0	3.7	3.7	25.9	48.1	18.5	4.74 (0.94)
The experience of using ePortfolios impeded my learning and skill development	14.8	11.1	7.4	29.6	25.9	11.1	3.74 (1.61)

Note: Likert scale: “1” strongly disagree to “6” strongly agree

I found the ePortfolio useful when collecting resources during my studies. As a result of how easy the ePortfolio was to collate information I will continue to use the programme throughout my studies and after I completing my degree.

The ePortfolio and online learning was a great way to engage your own learning and do your own research, particularly as an online student.

I really enjoyed the reflective journals and the ePortfolio method. It engaged me to learn in a fun and personal way. I enjoyed that it way technology based as I learned a lot about new programs myself as well. I had no idea what to expect from the ePortfolio but now that I've used it I will use it after graduation.

4.5 Predictors of overall influence of ePortfolio technology on learning and skill development

To further investigate the influence of ePortfolios as a vehicle for learning and skill development, hierarchical multiple regression was run to determine the best predictors of the dependent variable. "Overall influence of the technology" was the dependent variable assessing the overall influence of ePortfolios on learning and the overall usefulness of learning how to use the tool. The independent variables of previous experience, knowledge, attitudes toward using portfolios as well as accessibility were entered in Step 1. The independent variables of helpfulness, usability and support (as measured by those that received individual guidance or not) were entered in Step 2 to determine whether these variables predicted the overall influence after controlling for background variables and the initial accessibility issues. Although the sample size met the minimum criteria to allow regression analysis, the analysis should be considered to be exploratory and caution should be used in the interpretation of the results. Table VI shows the descriptive statistics, including correlation coefficients, means and standard deviations. Correlations ranging between 0.08 and 0.91 were found between the predictors and the dependent variable of the overall influence. A number of significant correlations between the predictors were also found, ranging from 0.38 to 0.86 (Table VII).

After Step 2, when all the variables were in the regression equation, a significant amount of variance in the overall influence was accounted for. In the first step of the hierarchical multiple regression analysis, experience, knowledge, attitudes and accessibility accounted for 51.9 per cent of the variance in the overall influence, which was significant. The regression coefficients showed that only attitudes contributed significant variance in predicting the overall influence ($t = 2.940; p = 0.008$). Higher expectations and attitudes were related to higher overall ratings of the ePortfolio tool. After controlling for the effects of

Variables	1	2	3	4	5	6	7	8	M	SD
1. Overall influence	–								9.23	2.20
2. Experience	0.08	–							3.06	1.70
3. Knowledge	0.25	0.86***	–						3.04	1.56
4. Attitudes	0.67***	0.20	0.42*	–					4.31	1.01
5. Accessibility	0.50**	0.05	0.08	0.38*	–				3.96	1.28
6. Helpfulness	0.91***	0.07	0.14	0.57**	0.64***	–			13.88	2.86
7. Usability	0.76***	0.12	0.13	0.36*	0.48**	0.75***	–		11.12	3.42
8. Support	0.26	0.14	0.18	0.10	0.40*	0.26	0.14	–	0.46	0.51

Table VII.
Summary of intercorrelations, means and standard deviations for the predictors of the overall influence of ePortfolio technology for facilitating critical reflection on students' learning

Notes: Significance at * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; $n = 27$

background data and accessibility, helpfulness, usability and guidance accounted for an additional 41.0 per cent of the variance in the overall influence. Inspection of regression coefficients in Step 2 showed that both helpfulness ($t = 6.113$; $p = 0.000$) and usability ($t = 2.545$; $p = 0.020$) contributed a significant unique variance in predicting the overall influence[2]. Thus, higher scores on usability and helpfulness were related to higher overall ratings of the ePortfolio tool provision of individual support and did not predict a significant unique variance in the overall influence on students' learning, indicating that higher overall ratings of the ePortfolio technology were found irrespective of the level of support provided.

5. Limitations and future research

The findings of this study should be viewed in light of the short horizon. The survey instrument concerning students' attitudes toward ePortfolios in assessing written communication was constructed in one semester to enable the authors to make preliminary observations. The study should (and will) be constructed over several semesters to address any immediate statistical validity issues to ensure the study's objectives are met and the results are empirically valid, robust and generalizable. Further research may entail various dimensions of written communication criteria previously documented in the literature, which can be applied to the ePortfolio assessment model.

6. Conclusion

The preliminary study advances our understanding of the implementation and influence of an online model to assess the level of knowledge and understanding of business concepts in a pioneering Indigenous dual-mode business course. This study was motivated by the lack of research on the use of ePortfolios in the social sciences, in particular the area of commerce and business. The introduction of a survey adapted from the Collis and Moonen 4 E Model and the CICTO framework facilitated the collection of necessary data on the use of ePortfolios as an assessment tool from the students' attitude point of view.

The post survey results suggest that students rated the use of ePortfolios highly in the course even after controlling for possible confounding variables such as previous experience, attitudes and accessibility. Students understand the benefits of ePortfolios and reflective journals in developing their technical knowledge on cultural diversity in a business context. This experimental study points to the need to understand the introduction and evaluation of such pedagogical approaches developmentally over time, for both students and teachers concerned. We note in this case that students do not yet understand the connection between critical reflective writing, and generic skills development or how the ePortfolio assessment tool supports written communication activities. As such, the findings of this study present a number of challenges. It would appear that students require additional written and communication activities and ePortfolio training during the course. In particular, students could benefit from workshops developing written communication skills in the workplace or "real world" as well as "hands-on" workshops on how ePortfolios could facilitate this. Similarly, in subsequent semesters, course convenors will benefit from students' improved written communication skills, as well as critical reflective writing. Nevertheless, the current study provides a foundation for improving the design and assessment of written communication work activities to achieve generic skills outcomes commensurate with university accreditation criteria.

The findings of this study could benefit those working in higher education, particularly accounting academics in Australian universities. Accounting academics could design the curriculum of the courses within the commerce programme that address programme learning objectives that align with graduate employability outcomes (Oliver *et al.*, 2011; Oliver, 2011). There appears to be very limited evidence of Australian universities, particularly the accounting and commerce courses, that use reflective journals and ePortfolios as part of their assessments. This study is timely because of the call by Australian professional accounting bodies requiring accounting graduates to have non-technical or soft skills such as communication, interpersonal and critical thinking skills. Moreover, this study could lead to the development of a sustainable community of practice by collaborating with professional accounting bodies and universities in areas of employability skills of our graduates for the future.

Notes

1. Table not shown.
2. Regression table not shown.

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