

A University-Wide ePortfolio Initiative at Federation University Australia: Software Analysis, Test-to-Production, and Evaluation Phases

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This paper describes an ePortfolio implementation strategy at Federation University Australia, Victoria (formerly the University of Ballarat). The authors combined a personal and practical viewpoint to elicit pitfalls, challenges, and recommendations for improvement. The paper is divided into three main areas in order to outline the experiments that occurred. The first section provides a standard literature review around ePortfolio adoption as well as a research-based analysis of available ePortfolio software at Australian universities. The second part depicts the University's ePortfolio implementation strategy that focused on "test-to-production" and technology dissemination phases. This section is based on the authors' personal viewpoint of ePortfolio adoption at a university where a "top-down management decision making model" (Slade, Murfin, & Readman, 2013, p. 178) was used. Third, the evaluation strategy is reported, which was based on similar research conducted at Australian universities (Hallam & Creagh, 2010; Hallam, Harper, Hauville, Creagh, & McAllister, 2009). This part is offered as a modest-scoped, mixed methods evaluation process. The paper extends on ePortfolio implementation strategies (Bell & White, 2013; Coffey & Ashford-Rowe, 2014; Jarrott & Gambrel, 2011; Lambert & Corrin, 2007; Ring & Ramirez, 2012; Slade et al., 2013) and software analysis (ACODE, 2011; Slade et al., 2013). Recommendations are made for the careful integration of pre- and post-rollout of ePortfolio programs with face-to-face ePortfolio tutor support, offering online resources and alternative portfolio-making options for students with poor broadband access.

Literature Review

The practice of ePortfolios in higher education and in the vocational education and training sector has increased steadily over the years (Coffey & Ashford-Rowe, 2014; Galatis, Leeson, Mason, Miller, & O'Neill, 2009; Ring & Ramirez, 2012). However, research indicates that the term *ePortfolios* "will not encompass every possible permutation" (Galatis et al., 2009, p. 6; Hallam & Creagh, 2010), its uses (Hallam & Creagh, 2010; Lambert & Corrin, 2007) or its purposes (Whilhelm et al., 2006). It would appear that some research around ePortfolio pedagogy and technology describes the general characteristics and different types of ePortfolios, users' experiences, attitudes, and opinions alongside providing opportunities for learners to demonstrate evidence of individual achievements, such as employability skills and graduate attributes (Barrett, 2007; Hallam & Creagh, 2010; Stefani, Mason, & Pegler, 2007; Strivens, 2007; Wade, Abrami, & Sclater, 2005). Other research provides numerous examples of the benefits of ePortfolios for fostering students' sense of pride in their work (e.g., Sherry & Bartlett, 2005), increasing students' learning motivation (e.g., Tosh, Penny Light, Fleming, & Haywood, 2005), and viewing ePortfolios as a way for students to share their work with others (e.g., Wilhelm et al., 2006).

Given the many proven learning and teaching benefits of ePortfolios in higher education, there is a need also to understand that to ensure success with implementing ePortfolios as a long-term project, time is required to perform an initial study on the experience,

challenges, and issues, after which wider implementation can occur. However, effective technological adoption and undertaking of a wide evaluation process can be problematic for those who are at the "coal face" of ePortfolio adoption when a "top-down management decision making model" (Slade et al., 2013, p. 178) is used, or when time and financial constraints are of importance. Concomitantly, a review of previous university-wide ePortfolio initiatives is therefore beneficial (Coffey & Ashford-Rowe, 2014; Hallam & Creagh, 2010; Hallam et al., 2009; Lambert & Corrin, 2007; Slade et al., 2013).

The study reported in this paper was influenced by research advocating the importance of reviewing learning design and existing technologies in higher education, particularly in the area of enterprise (e.g., Ferdig, 2005; McAfee, 2006; Salmon, 2011). Notwithstanding, it was also motivated by the literature that showcases an understanding of technology implementation strategies, such as considering the existing culture of an organization (e.g., Conole, White, & Oliver, 2007) in the midst of significant change (e.g., Ferdig, 2005; Henriksen, 2002) and the necessity of "alignment to institutional and user needs" (Slade et al., 2013, p. 177).

ACODE (2011), Butler (2006), Himplsl and Baumgartner (2009), and Uys (2007) have extensively reviewed the success criteria for an ePortfolio system and identified key elements. In addition, alternatives to traditional ePortfolio platforms such as websites, blogs, and wikis have also been recognized, but with different implications for learners and institutions (e.g.,

Electronic Portfolio Action and Communication Wiki Space, 2013). Moreover, based on the work conducted in the UK as part of the Joint Information Systems Committee (JISC, 2008) ePortfolio investigation, a series of five threshold concepts were suggested to ensure successful institutional adoption of ePortfolios. These were: the purpose, learning activities design, process, ownership, and disruptive nature of ePortfolios (JISC, 2008; Joyes, Gray, & Hartnell-Young, 2010). Furthermore, the success criteria for ePortfolio implementation relating to students (curricular) has been outlined by Butler (2006), the Australian ePortfolio Project (Hallam et al., 2009), and Joyes et al. (2010), who proposed that ePortfolio-making is more likely to occur with support from the university's highest level, such as learning and teaching committees, internet technology staff, and faculty leaders (Allan & Cleland, 2012). Alternatively, Slade et al. (2013) advocated a middle-out approach rather than a top-down approach to technology adoption. By contrast, within the Faculty of Education at the University of Tasmania, Australia, the creation of a community of practice for the learning management system was initially established, in which students could have all questions related to ePortfolios answered from both a technical and educational perspective (Allan & Cleland, 2012). The community of practice, along with a structured workshop series, scaffolding of activities, and the provision of templates were key to the successful implementation three years on.

The study noted in this paper focuses on the approach reported by Parker (2010), in which a lecture style was used for training, along with the option of seeking additional help, and was found to be inadequate. Instead, students viewed demonstration and training in a computer laboratory as more advantageous. This research project takes as its lead recent studies that advocate such notions and also identify key barriers to ePortfolio technological implementation (Butler, 2006; Owen, 2009). These are:

- The need for and access to adequate hardware and software that is maintained;
- An awareness of the lack of technological skills amongst staff and students;
- Addressing technical problems and support for staff and students;
- Adequate storage space and server reliability;
- Demands on staff time;
- Efficient use of student time;
- Ownership and technological issues;
- Security and privacy of data;
- Appropriate features and control over them;
- Access and permission controls;

- On-going access for students upon completion of their course.

It would appear that the substantial literature and reports on ePortfolio practice and pedagogy illustrate a breath of implementation overview, practice, users' experience, and users' advice (e.g., Chau & Cheng, 2010; Dinmore, Kherwald, & Bradford, 2011; Halstead & Wheeler, 2009; McNeill & Cram, 2011; Taylor, Dunbar-Hall, & Rowley, 2012; Wilhelm et al., 2006). However, there is still immense scope for further research into specific implementation methods that expand on the literature. More specifically, in Australia there is limited research available on the practice of implementing ePortfolios at a university-wide level where a "top-down management decision making model is used" (Slade et al., 2013, p. 178; e.g., Coffey & Ashford-Rowe, 2014; Hallam & Creagh, 2010; Hallam et al., 2009; Lambert & Corrin, 2007). Therefore, this study addresses the critical issue of selecting an institution-wide ePortfolio system based on the following: (1) a top-down management decision making model; (2) significant time and financial constraints; (3) limited technological support; and (4) the requirement to implement a centralized ePortfolio system for learners.

Federation University Australia is a rural, dual-sector university and the third oldest site of higher learning in Australia, with approximately 23,500 domestic and international students enrolled each year. Many of these students are the first in their family to attend university. The institution offers secondary schooling, vocational education and training, higher education, and post-graduate studies. Thus, the ePortfolio software must be appropriate for a wide range of disciplines, educational contexts, accreditation needs, and have the ability to showcase a wide range of artifacts and evidence of learning, as the software will be used by students from both the vocational education and training and higher education sectors. With this in mind, it is important to consider that rural universities do not tend to have the resources (and/or finances) readily available for such undertakings compared to the larger capital city-based institutions. Therefore, in this study, the success or otherwise of ePortfolio implementation is dependent on the perspective of those involved. As Joyes et al. (2010) and Voigt (2009) noted, while technical support may be important to some, it will be pedagogical support that is more important to others. Finally, the study reported in this paper contributes to ePortfolio implementation strategies, innovative technologies in education, and inherent challenges (e.g., Bell & White, 2013; Burnett, 2001; Jarrott & Gambrel, 2011; Lambert & Corrin, 2007; Ring & Ramirez, 2012; Slade et al., 2013).

Limitations

One of the major limitations of this study is that the technological innovation adoption (test-to-production) was made over a limited period of time. This was mainly due to staff turnover, particularly in the area of technical ePortfolio support as well as institutional time and financial constraints (due to external factors). A more stringent test of adoption of an innovation, or success of an implementation plan, would be needed to ascertain its continuation or persistence over a longer period, such as several years. The results presented here do not show data collected over a longer period of time. However, because of the importance of exploring innovation adoptions over an extended period of time, a further mixed methods research ePortfolio project is currently being completed at the university. This, in turn, will assist in furthering conversations, evaluation outcomes, and recommendations, as well as the promotion of ePortfolio adoption at the university.

Implementation

In the following sections, the method and results of the implementation phases of the ePortfolio adoption are outlined, noting the various successes and challenges. This is achieved by describing the information under three main headings: (1) ePortfolio software at Australian universities, where information about the choice of software is presented; (2) implementation strategy; and (3) a modest-scaled evaluation process, which was based on similar research conducted at Australian universities (e.g., Hallam & Creagh, 2010; Hallam et al., 2009).

ePortfolio Software at Australian Universities

Choosing the right ePortfolio platform is no easy matter. For instance, deciding on an appropriate university-wide ePortfolio platform can vary extensively from institution to institution (Conole et al., 2007; Goldsmith, 2007; Slade et al., 2013). For Federation University Australia, implementing a university-wide tool proved challenging, with the following points of particular concern:

- How will ePortfolios be used?
- Who will use ePortfolios?
- How to avoid smothering innovation and creativity (Slade et al., 2013);
- Who is the intended audience?
- How to ensure that the software meets the needs of all users;

- Ascertaining the costs and availability of hardware and software resources (ACODE, 2011; Butler, 2006; Himplsl & Baumgartner, 2009; Uys, 2007).

Conversely, Himplsl and Baumgartner (2009) stated that in 2008 there were over 60 ePortfolio providers to select from, which can make decisions even harder. For instance, Slade et al. (2013) highlighted the difficulties of deciding on an ePortfolio platform due to the extensive list of ePortfolio solutions that are now available, and “chos[ing] to only consider options for which there was either experience available with the university and more generally available in the higher education sector” (p. 180). Himplsl and Baumgartner’s (2009) ePortfolio software categories and the Educational Technology Survey report (ACODE, 2011), which was conducted by Sarah Lambert, were important factors for the University of Southern Queensland’s ePortfolio decision-making strategy (Slade et al., 2013). Similarly, the abundance of alternative choices to traditional ePortfolio platforms that are presented on the Electronic Portfolio Action and Communication Wiki Space (2013; e.g., Wordpress, Google Apps, and wikis) further creates various issues around ePortfolio decision-making.

For this research project, it was the ACODE (2011) and Himplsl and Baumgartner (2009) reports that were used, aiding conversations and recommendations regarding the University’s senior management culture for decision making. The reports exhibited the group of leading ePortfolio software in the higher education area, namely Mahara and Pebblepad, which presently are the most frequently used (traditional) ePortfolio platforms in Australia’s higher education sector. However, the reports did not emphasize each university’s ePortfolio software in detail. Due to the ever-evolving technological ePortfolio landscape in Australia’s higher education, the present authors conducted a World Wide Web internet search of 35 Australian universities’ homepages to gain an “Australian-centric” ePortfolio users’ perspective (see Appendix). The internet search review was deemed advantageous by the University’s senior management so that technology adoption software that was currently being used in Australia could be analyzed, with the information gained being used for official decision-making. The review process was based on a similar collection method conducted by Hains-Wesson (2012), in which “Australia’s and the United Kingdom’s universities’ homepages were located on the World Wide Web . . . in order to present a detailed account of online creative journals that operated as Work-Integrated Learning activities” (p. 267). The method was adapted to fit the research project’s purpose. The review was completed by first utilizing the list of Australian universities presented on

the ACODE (2011) survey report and then manually completed an internet search of each university's homepage with the key search words "ePortfolios," "portfolios," and/or "education portfolios." The process enabled the researchers to locate current ePortfolio information. To account for any missing information, a member from the research team telephoned each university's Learning and Teaching Centre and/or sent an e-mail to the appropriate manager to request and obtain the data. The data presented in the Appendix corresponds to the ACODE (2011) survey results, but with the addition of specific ePortfolio platform details from each university. The authors extracted specific data relating to rural, dual sector universities from the information presented in the Appendix to help address the broader needs of students at Federation University Australia (see Table 1).

At the time, a close analysis of the literature around ePortfolio software analysis (ACODE, 2011; Himpl & Baumgartner, 2009), alongside the data presented in Table 1, suggested an even spread of Mahara, Pebblepad, and other ePortfolio use at Australian universities. Using the data from the reports and the internet search review process, the information was presented to the University's senior management team, providing extra evidence. In addition, senior management requested the following additional criteria to be considered:

- The ability of the software to deliver a diverse range of institutional reporting needs, such as demonstrating competency and accreditation requirements and showcasing a variety of artifacts;
- The ability of the software to be integrated with the university's learning management system (Moodle);
- That the software should be open source and have an active community of practice;
- The ready availability of introductory online resources (e.g., information on how to set up an ePortfolio);
- The ability of the software to provide built-in tools such as content management and plug-ins for mobile use within the university's learning management system (Moodle);
- A history of other universities active use of the ePortfolio software in order to establish a community of inquiry across institutions, encouraging knowledge-sharing.

Moreover, when implementing new technology, the university's context, management culture and goals are key when making decisions. Evans and Benefield

(2001) pointed out that to evaluate ePortfolio adoption properly, it is beneficial to undergo an extensive review in order to make good decisions. With this in mind (and the above review method and points taken into consideration), Mahara was chosen to be the official ePortfolio platform.

First, it met the university's criteria. Second, it was an educational and functionally effective solution for Federation University Australia because of its open source software licence, ease of compatibility into the university's LMS (Moodle), and focus on being a personal learning environment that mixes with social networking and allows users to easily collect, reflect on, and share their achievements. However, the university's decision to purchase an open source ePortfolio software such as Mahara, with its active community of practice and history of other universities using the software, did not mean fewer challenges. These challenges are detailed in the following section in terms of the implementation strategy employed.

The Implementation Strategy

As mentioned previously, the following implementation strategy was based on a top-down management decision model rather than a "middle agent feasibility study" (Slade et al., 2013, p. 178). It is also important to note that in early 2012, when senior management decided that a Mahara system was to be implemented as the university-wide ePortfolio system, a test phase was established and opened up to interested teachers and students to experiment with on an ad hoc basis. The majority of ePortfolio users in the test environment were from the disciplines of education and nursing. This outcome aligns with research around specific disciplines that are most likely to take-up ePortfolio adoption quickly (Bashook, Gelula, Joshi, & Sandlow, 2008; Maher & Gerbic, 2009) compared to others areas of study, such as engineering or mathematics (Carroll, Markauskaite, & Calvo, 2007). By late-2012, and after much deliberation with numerous university stakeholders, the university's Learning and Teaching Committee released a document titled "Learning and Teaching Plan 2012-2014" (University of Ballarat, 2012). In this document, the authors noted that ePortfolios were one of the key eLearning tools to benefit learning for reflective practice, assessment, and evidence learning (Slade et al., 2013). University of Ballarat (2012) also presented key performance indicators for the university-wide ePortfolio initiative, anticipating that students' active use of ePortfolios would increase by the end of 2015. In order to meet the University of Ballarat's (2012) objectives, meet the Federation University Australia's strategic learning and teaching outcomes, and to go effectively from test-to-production, it became essential

Table 1
*Summary of ePortfolio Software Platforms Supported in Australia's Rural
 and Dual Higher Education Sector in 2014*

Name of institution	Mahara	Pebblepad	Other
Central Queensland University***	√	X	X
Charles Darwin University**	X	X	Web2.0
Royal Melbourne Institute of Technology*	X	√	X
Southern Cross University***	X	√	X
University of Sunshine Coast***	X	√	X
The University of New England***	√	X	X
Victoria University*	X	X	Desire2Learn
Total	2	3	2

Note. √ = Used. X = Not used. **Swinburne University of Technology are two of only five dual-sector institutions in Australia, of which **Charles Darwin University is the only one outside Victoria. The others are *Royal Melbourne Institute of Technology and *Victoria University. ***There are five rural universities in Australia.

that a dedicated staff member be made responsible for the rollout. The requirement to support test-to-production with pedagogical and internet technology support was enacted, and providing support structures for teachers and users was highly recommended. As a consequence, a working party was created to encourage innovation and individual staff members selected to introduce change and encourage peers to follow (Cummings, Phillips, Tilbrook, & Lowe, 2005). The working party included key ePortfolio stakeholders, such as those who had influenced the test phase, and staff members such as internet communications technology staff, administrators, academics, general staff, and one student representative with the knowledge that ePortfolios can “enhance teaching, learning and assessment practices” (Davis & Murrell, 1994, p. 2). The formation of the working party also aligned with the recommendations made by the Australian ePortfolio Project (Hallam et al., 2009), as well as the successful university-wide ePortfolio project that had occurred at the University of Wollongong, New South Wales, Australia (Lambert & Corrin, 2007). The members of the working party were also responsible for communicating recommendations to senior management, the test-to-production phase, a modest-scoped evaluation, and the following specific outcomes:

- Review, evaluate, and fix any errors associated with the Mahara test environment, ePortfolio software, and hosting system;
- Plan, develop, and implement an appropriate and effective production rollout framework (i.e., test-to-production);
- Organize the website branding of the open source software to coincide with the university's webpage design and policy;

- Develop best practice internet technology upgrades, solutions, and website hosting procedures post-test-to-production phase;
- Increase the membership of the working party to enable more expert advice on the effective use of ePortfolios and implementation across the rural dual-sector university;
- Create online resources that are user friendly and relevant;
- Communicate, plan, and implement ePortfolio workshops and seminars around internet technology and pedagogy for students and teachers, particularly those who were new to ePortfolios.

In reality, however, the above objectives were not free from hindrance. For instance, the test-to-production phase took place at a time when the Victorian State and the Federal Governments had announced financial cutbacks that affected the vocational education and training and the higher education sectors in Victoria, Australia. The Victorian Government (the Baillieu Government at the time) “had slashed \$290 million from the sector, with around the same amount to be cut in both 2013 and 2014” (Rea, 2012, p. 16). It was also essential that the rollout plan occurred in order to meet the University of Ballarat's (2012) learning plan outcomes, the requirements of the Australian Quality Framework (the national policy for regulated qualifications in Australian education and training), and the Tertiary Education Quality and Standards Agency (Australia's independent national regulator for the higher education sector) by 2015 (Milne, Heinrich, & Lys, 2010). In order to provide a high quality ePortfolio experience for students and staff that met the above points at a financially difficult time, the formation and involvement of the working party was imperative. In

addition, the ePortfolio platform required an appropriate upgrade, as the test environment had already alerted the university's technological support staff to various errors in the program that were occurring at the time, such as a failure to embed certain files and videos successfully, and sporadic text disruptions throughout users' ePortfolios. Website branding also needed to occur and the online resources and policies associated with privacy, assessment, and security needed to be updated. In other words, it was important to get the technology right before ePortfolios could be successfully rolled out on a university-wide level. One of the main challenges during this time was keeping in mind the established users within the test system. Without internet technology being stable and up-to-date, there were risks of ePortfolio test-environment users becoming ePortfolio-fatigued and/or lacking ePortfolio creation motivation. Additionally, without effective internet technology support, it would be difficult to meet the university's curriculum-renewal strategy for undergraduate degrees (University of Ballarat, 2011). As one of the key recommendations stated,

The University will ensure that all students are provided with the opportunity to record the development of their graduate attributes and that attainment of these be assessed, where possible and applicable, as part of the curriculum using an assessable portfolio which is part of a final course. (University of Ballarat, 2011, p. 1)

With the decision to rollout Mahara as the official ePortfolio software for Federation University Australia, and to therefore go from test-to-production, it became necessary to offer workshops and seminars on ePortfolio making for new users on assessment practice and on showcasing and evidencing learning. This needed to occur within a constricted time frame, which was approximately eleven weeks. Ultimately, the working party needed to keep abreast of the University's assessment due dates across the teaching landscape, so as to minimize any disruption due to the upgrade from test-to-production, notwithstanding the fact that successful broader implementation of ePortfolios can be dependent on evaluation.

In the following sections, the modest-sized evaluation phase of the project is presented, which was based on the authors' viewpoints from the participants' experiences in workshops and seminars.

The Evaluation Process

Participants who were new to ePortfolio-making were encouraged to take part in the evaluation phase of the project. Users within the test environment were also

invited to participate. This was achieved through notification of the opportunity to participate in ePortfolio workshops and seminars via posters, word-of-mouth recommendations, networks, and program presentations. The ePortfolio initiative was modestly evaluated due to the majority of participants being self-selected and new to ePortfolios. The workshops centered on information about specific challenges for new users to the system and how to use ePortfolios for an assessment task such as reflective practice for teachers, course accreditation requirements, and the showcasing of artifacts. The majority of participants ($n = 34$) had no prior knowledge of ePortfolios (96%). They were keen to find out what an ePortfolio could offer in terms of professional development, such as research, networking, and/or the evidencing of achievements as part of the student learning experience. Student participants ($n = 18$) were invited by their teacher/s to take part in the ePortfolio workshops because reflective practice via ePortfolio was being introduced as a major assessment item. Similar to those for staff, student ePortfolio workshops were often presented in computer laboratories, with three additional seminars being presented in a classroom. On request, all workshops and seminars for staff and students were repeated when requested within the 11-week period.

Method

The Australian ePortfolio Project's (AeP, 2010) learning and teaching survey was modified for the project's modest evaluation phase. Minor changes were made to the AeP survey, with the following research questions guiding these changes:

- What factors do you believe will help you to implement/develop an ePortfolio?
- What factors do you believe prove or are proving difficult for you to implement/develop an ePortfolio?
- If you have developed an ePortfolio, what impacts do you believe have occurred as a result of your ePortfolio use?

Participants

The participants ($n = 52$) consisted of 89% from the higher education sector, with the remaining from the vocational education and training area. There was an even mix of male and female participants.

Survey

The construction of the survey was based on similar research conducted at Australian universities

(Hallam & Creagh, 2010; Hallam et al., 2009). The survey consisted of a mixture of eight open-ended and closed questions.

Workshop Implementation

It is important to note that each workshop was purposely delivered according to the needs of the participants. For example, some presentations were conducted in a seminar room, where the presenter showed information to the audience via a large computer screen, or in computer laboratories where participants could actively try out the new information being learned. At each presentation, the following main topics were focused on: (a) an introduction to the term ePortfolio; (b) the benefits of creating and sustaining an ePortfolio; (c) where to find online resources for the novice ePortfolio designer; and (d) showing examples of good practice ePortfolio-making from the active test environment already established in the system. Additionally, any internet technology concerns that participants had were also a priority in the workshops (e.g., how users share ePortfolios, how to insert links and videos). Each session concluded by inviting participants to provide anonymous feedback via the survey. The second aim of the evaluation was to gather information from new ePortfolio users, such as their opinions and experiences. This part of the evaluation strategy was important to the research team in order to ensure that the technology was functioning at a high standard.

Survey Results

The participants came from a variety of disciplines and areas, such as psychology, sciences, internet technologies, business, food science, and the vocational education and training sector. There was not enough data to disclose gender or age range as a variable. Once the feedback from the surveys was collected, the data were extracted, de-identified, and placed into an Excel spreadsheet. The research team analyzed and used pivot tables to provide quantitative analysis, with the qualitative responses being manually coded by themes. The key themes that emerged from the data were: (a) understanding ePortfolio use; (b) issues around ePortfolio use; and (c) support around ePortfolio use. The following section provides the quantitative analysis by theme followed by the qualitative responses.

Quantitative Results

Understanding eportfolio use. The ePortfolio workshops during the test-to-production phase were developed to encourage new and established test environment users to feel supported when discussing

the challenges and benefits of implementing ePortfolios in learning and teaching experiences. The workshops also provided participants with an avenue to provide feedback to the research team in order to instigate positive change during the test-to-production phase and to communicate recommendations to senior management. The workshops were also a good opportunity to make sure that the technology was functioning at a high standard, as well as to address any learning and support gaps. The workshops also assisted the researchers in deciding which cohort would be most advantageous for a future technological adoption-evaluation outcome over a longer period of time.

One of the main outcomes of the workshops was that a number of participants ($n = 20$) suggested that they gained more than a rudimentary understanding of ePortfolios, with over 80% of informants noting that they felt ePortfolios were *very important* or *important* to their teaching and learning journey.

Issues around eportfolio use. Some of the key concerns that participants had about implementing ePortfolios involved not understanding the software program, and they often stated that they were slow to learn, especially when internet technological support was not present or internet access was slow. Factors respondents felt might impede their ePortfolio making included: (a) self-motivation and a lack of clear direction; (b) a lack of internet access at home; and (c) the nature of the Mahara program (e.g., “sometimes I find it just confusing, with all the many tabs that Mahara has”).

Support for eportfolio use. The quantitative results from the surveys further illustrated that after a second or third workshop, users were more aware of online assistance being offered rather than the hardcopy support resources or face-to-face tutor support. For example, 27% versus 54% were aware of online resources and tutor support, with over 50% of participants being aware of online guidance on how to use Mahara, a tutorial program to support the ePortfolio process, and the opportunity of face-to-face tutor support for learners. Therefore, while less than 30% were aware of online tutor/mentor support for feedback at the end of a workshop, this number had doubled by the time additional sessions were offered to the same cohort. For instance, at the completion of a third ePortfolio training session participants indicated that the factors they believed would help them with their ePortfolio assessment were: (a) ease of accessibility, (b) confidence with the software program; (c) getting face-to-face help from the ePortfolio support staff member; and (d) completing the training sessions and receiving on-going face-to-face feedback from the lecturer.

In terms of the workshops, 92% of participants found them to be highly effective, and many participants (including both teachers and students)

noted that they found the workshops worthwhile (e.g., “Meeting new people, being able to read other people’s work for my benefit only—what I compete with really—and how I can improve my writing—something I’m not strong at”).

Qualitative Results

Understanding eportfolio use. A number of participants were unaware of what an ePortfolio was or its capabilities, saying, for example, that “I had never heard of ePortfolios so it was a good introduction and I am very interested in starting one” and “I didn’t know about ePortfolios until today—will have to explore further to know what it might mean for me in the future.” The workshops proved useful for new users due to the benefit around introducing teachers and students to the software as well as its educational opportunities that already had an active community of practice within the system. For example, by the end of the workshop participants were writing insightful comments. The following list illustrates participants’ comments on the opportunities an ePortfolio could offer: “It’s like a blog or social network site where students interact with each other”; “[It’s] a place to show your professional history”; “[It’s] a tool to develop material related to study that may be useful in the future”; “[ePortfolio is] an on-line repository of personal and professional information that can be available to myself and others”; and “Viewing what others have already done with their ePortfolios [is beneficial] for [developing] ideas.”

Support around eportfolio use. The overall feedback gained from the participants also showed that there was a real need for consistent support, such as online and face-to-face resources (blended) and showcasing (early) good practice (e.g., examples of effective ePortfolios in order to fully appreciate its value in learning and teaching). The participants’ responses suggest that this needed to occur prior to, during, and after the test-to-production phase. According to JISC (2008), it is necessary to understand that the learner’s initial difficulties with both technology and reflective learning increase the workload of tutors and internet technology support staff in the early stages of implementation. This was also a key concern that was expressed and observed by the research team in the workshops. However, once autonomous learning was established, the support required from tutors and internet technology staff diminished, making more time for proactive interventions with individuals around their ePortfolio-making endeavors.

Issues around eportfolio use. One area of concern was related to an instructor’s awareness of the advantages and disadvantages of ePortfolio assessment.

On the one hand, digital portfolios offered more efficient working practice, enabling marking and verification to take place incrementally. Yet, the diversity of evidence contained in ePortfolios can make them harder and more time consuming to mark. There were also concerns raised by participants about ePortfolio ownership upon graduation. As a result, the feedback from participants assisted the working party to solve this particular issue by orchestrating and sustaining stronger links with the university’s administration process, alumni membership, Careers Centre, and Student Experience Officers to grant graduates continued use of their ePortfolios after graduation. This particular issue and outcome is also in line with previous research (Hallam et al., 2009; JISC, 2008), and ideally, the ePortfolio system should always allow users to export their ePortfolio account and/or to continue using their ePortfolios as an Alumni member to encourage life-long learning.

Participants also explained that ePortfolio construction was only important to them because of a course’s requirements of ePortfolio assessment. It was often teachers who were also students that made these types of comments (e.g., “[Unless] consistent and effective feedback is provided, [I would] prefer face-to-face contact and an assessment task that could be handed in via a hard copy format”). Students regularly reflected on being “personally frustrated” with ePortfolio making, which was mainly due to inadequate feedback and insufficient internet technology support or training rather than the ePortfolio platform itself.

Some participants expressed that using a remote and/or poor internet connection influenced their decision to avoid completing an ePortfolio assignment. In the literature, this is also a common concern, particularly in the context of rural universities (e.g., Bell & White, 2013). The below quote from a participant further reflects this particular point:

The videos [that help explain how to make an ePortfolio] may have been more helpful if they would have downloaded faster at home. For some reason your videos literally take forever to download at our rural property and therefore are not accessible for me unless I travelled either to the university or my workplace (64 kilometres away).

Conclusion

The study described a challenging ePortfolio implementation strategy at a rural, dual sector University in Victoria, Australia, which was based on the researchers’ perspectives via a top-down management approach to technology adoption to drive change (Cummings et al., 2005). The findings detail an ePortfolio implementation process, alongside a modest-

scoped, mixed method evaluation, which was impacted due to time and financial constraints. Throughout the study, the authors combined a personal and practical viewpoint to elicit the complex nature and continual shifting ground of ePortfolio adoption at an institutional level where management culture, financial, technological, and pedagogical constraints are of importance. According to Rogers (2003), most faculty members adopt innovations at individually varying rates, and achieving faculty compliance takes time and development. For example, when users were asked what factors helped them to plan, develop, and sustain an ePortfolio in their teaching and learning, the majority of participants commented that receiving help from peers, perseverance, actively accessing online tutorials about ePortfolio use, participating in face-to-face workshops, trial and error, a desire to create web pages, and previous knowledge of ePortfolios as well as technological skills were all highly beneficial.

Despite the modest number of participants ($n = 52$) who took part in the mixed-method evaluation phase, the results have been advantageous to the ongoing rollout and improvement of the ePortfolio program at Federation University Australia. For instance, the following recommendations were developed and were based on the participants' experiences at the workshops and seminars:

- Provide engaging and minimal downloads of hypertext links to video or PDF files for all online resources, as well as offer face-to-face professional development sessions around alternative ePortfolio submission practices for students with poor broadband access;
- Provide users with engaging and minimal downloads for all online resources to showcase alternative ways to evidence learning, such as using audio (podcast recordings) that can be uploaded when at a campus internet accessibility area or via a rural Wi-Fi community hub area;
- Encourage the use of CD-ROM formats for critical content that is easily accessible for students who do not have effective broadband access;
- Offer students ePortfolio alternative submission practices, such as DVD/CD or USB modes, especially for those who have mobility issues, in order to provide inclusive learning practices;
- Provide ongoing introductory sessions for new users, ePortfolio workshops via face-to-face sessions around sustaining an ePortfolio, and "tricks of the trade" for intermediate to advanced users;
- Provide online forums or a comment function for staff and students to submit opinions and express their learning and teaching needs around the university's standardized ePortfolio system for improvement;
- Allow for successful growth of simple social technologies such as blogs, wikis, rich site summary (RSS) feeds, and social networking tools, alongside the university's ePortfolio tool to support the use of a variety of digital learning experiences that can meet diverse learning and technology requirements;
- Provide examples of rubrics in order to assist teachers with the time-consuming nature and difficulties around the marking of ePortfolio work.

The results from this project indicate that more can be learned from studies such as these, especially around the subjects of the impact of ePortfolio-making over a longer period of time and of minimizing the digital divide for rural-based learning via a wider evaluation process. Other related areas of further research might include whether or not universities would be wise to offer multiple ePortfolio systems for students alongside traditional platforms, including hardcopy options if broadband is not sufficient. It would also be advantageous to conduct a global ePortfolio software analysis and collect data from sites such as Electronic Portfolio Action and Communication (EPAC) and report the findings alongside the internet search data collection process used here. Another area of interest is to discover what industry's expectations might be regarding students evidencing of learning and graduate outcomes for job readiness, especially considering the recent Hart Research Associates (2013) report, in which "four in five employers say an electronic portfolio would be useful to them in ensuring that job applicants have the knowledge and skills they need to succeed in their company" (p. 3). Finally, we concur with previous studies (e.g., Allan & Cleland, 2012) that ePortfolio workshops are more beneficial in high functioning computer laboratories than in lecture theaters and that offering ePortfolio aid wholly online via engaging and minimal downloading as well as providing continual face-to-face support options at the introductory, intermediate, and advanced levels is important for sustainable ePortfolio implementation.

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Author's Notes

1. Ethics clearance was obtained: D12-003 (2013).
2. Ethics clearance was obtained: B12-135 (2013-2015).

Appendix
A Summary of ePortfolio Software Platforms Being Supported in Australia's Higher Education Sector (2014)

	Name of Institution	Mahara	Pebblepad	Other	url address as of 2014
1	Australian National University	√	X	X	http://cecs.anu.edu.au/files/ePortfolioConferenceHandout.pdf
2	Central Queensland University***	√	X	X	http://www.cqu.edu.au/about-us/learning-and-teaching/office-of-learning-and-teaching/resources/learning-technologies/e-portfolios
3	Charles Darwin University**	X	X	Web2.0	http://learnline.cdu.edu.au/units/hit381/eportfolio/startup/startup.html
4	Charles Sturt University	X	√	X	http://www.csu.edu.au/division/landt/resources/eportfolio
5	Curtin University	X	X	In-house	https://iportfolio.curtin.edu.au/
6	Deakin University	X	X	Desire2Learn	Learning Management System log in access only
7	Edith Cowan University	X	√	X	http://intranet.ecu.edu.au/learning/current-projects/learning-portfolio-pebblepad
8	Flinders University	X	X	Web2.0	http://www.flinders.edu.au/eportfolio/
9	Griffith University	X	X	Blackboard	unknown
10	James Cook University	X	√	CareerHub	http://www-public.jcu.edu.au/careers/JCUPRD_034893
11	La Trobe University	X	√	X	http://www.latrobe.edu.au/students/it/teaching/pebblepad
12	Macquarie University	X	X	X	unknown
13	Monash University	√	X	X	http://www.monash.edu.au/news/monashmemo/assets/includes/content/20100623/stories-more-uni-news1.html
14	Murdoch University	X	√	X	http://our.murdoch.edu.au/Educational-Development/Educational-technologies/PebblePad/
15	Queensland University of Technology	X	X	In-house	http://www.studentportfolio.qut.edu.au/
16	Royal Melbourne Institute of Technology*	X	√	X	http://rmit.edu.au/browse;ID=075sqig1pgj0z
17	Southern Cross University***	X	√	X	http://scu.edu.au/teachinglearning/index.php/79

18	Swinburne University of Technology**	X	X	Online Galleries	http://www.swinburne.edu.au/design/portfolio/docs/pdf/GPS_Gradex.pdf
19	University of Adelaide	X	X	X	unknown
20	University of Canberra	X	X	X	unknown
21	University of Melbourne	X	X	Blackboard	http://www.lms.unimelb.edu.au/user_guides/portfolio_student_guide.pdf
22	The University of New England***	√	X	X	unknown
23	University of New South Wales	√	X	X	unknown
24	University of Newcastle	√	X	X	unknown
25	University of Queensland	√	X	In-house	http://www.elearning.uq.edu.au/content/eportfolios-eportfolios-currently-used
26	University of South Australia	√	X	X	http://w3.unisa.edu.au/tel/learnonline/eportfolio.asp
27	University of Southern Queensland***	√	X	X	http://www.usq.edu.au/ele/eportfolio
28	University of Technology Sydney	X	X	In-house	http://www.iml.uts.edu.au/elearning/eportfolios.html
29	The University of Sydney	X	√	X	http://sydney.edu.au/elearning/staff/getStarted/ePortfolio.shtml
30	University of Tasmania	X	√	Desire2Learn	http://www.teaching-learning.utas.edu.au/elearning/eportfolios
31	University of Sunshine Coast***	X	√	X	http://www.usc.edu.au/university/learning-and-teaching/eportfolios
32	University of Western Australia	X	X	In-house	http://www.ecm.uwa.edu.au/_data/assets/pdf_file/0020/2285201/FASE-Seminar-Flyer-16-April-2013.pdf
33	University of Western Sydney	X	X	X	unknown
34	University of Wollongong	√	√	X	http://staff.uow.edu.au/eteaching/ePortfolio/index.html
35	Victoria University*	X	√	Desire2Learn	http://learningandteaching.vu.edu.au/teaching_practice/blended_learning/elearning_environment/eportfolio/
Total		10	12	14	

Note. √ = Used. X = Not used. *Federation University Australia is the only regional multi-sector university and **Swinburne University of Technology are two of only five dual-sector institutions in Australia, of which **Charles Darwin University is the only one outside Victoria. The others are *Royal Melbourne Institute of Technology and *Victoria University. ***There are five rural universities in Australia.