International Journal of ePortfolio
http://www.theijep.com

2018, Volume 8, Number 1, 43-55
ISSN 2157-622X

Highly Structured ePortfolio Platform for Bachelor of Nursing Students: Lessons Learned in Implementation

Emma Collins and Ray O'Brien
Otago Polytechnic

In 2015, the School of Nursing at Otago Polytechnic, a tertiary institution in Dunedin, New Zealand commenced using an ePortfolio platform with students in the Bachelor of Nursing program. A project was undertaken to evaluate the implementation of this technology and determine its ongoing use. This sequential, exploratory, mixed-methods research consisted of surveys and focus groups with relevant faculty and students, using the Technology Acceptance Model. The results showed that there was support for the ongoing use of the platform. Specific recommendations were made to increase the acceptance of the platform.

Existing research justifies using ePortfolios rather than paper based portfolios in undergraduate nursing education, both nationally and internationally (Andrews & Cole, 2015; Birks, Hartin, Woods, Emmanuel, & Hitchins, 2016; Garrett, MacPhee, & Jackson, 2012; Green, Wyllie, & Jackson, 2014). The implementation of this shift from paper to electronic portfolios has not yet been evaluated in the undergraduate nursing context in New Zealand. This evaluative process is important, as poor implementation may be detrimental to learning and reduce the likelihood of continued use of a professional nursing portfolio (Birks et al., 2016). When a platform is implemented well, it can lead to enhanced knowledge and skills for its users (Posey et al., 2015). Appropriate implementation is therefore significant to educators who are implementing ePortfolios, nursing students, the regulatory bodies who ensure that nurses are competent to practice, and potential employers. This study addresses the research gap by evaluating the implementation of ePortfolios in an undergraduate nursing program in New Zealand.

This article initially explores the existing research. The mixed-method research design will then be described. The results and discussion that follow evaluate the implementation of the ePortfolio based on the Technology Acceptance Model (Andrews & Cole, 2015; Davis, Bagozzi & Warshaw, 1989; Shroff, Deneen, & Ng, 2011). The conclusion describes the overall level of acceptance and informs future implementations.

Literature Review

ePortfolios are well documented in international literature and have been a feature of higher education for many years (Andrews & Cole, 2015; Birks et al., 2016; Garrett et al., 2012; Green et al., 2014). Portfolios in general have long been used in nursing and nursing education (Birks et al., 2016; Green et al., 2014), and there has been some discussion in the literature regarding the implementation of ePortfolios within this discipline (Birks et al., 2016; Garrett et al., 2012; Karsten, 2012). The Nursing Council of New Zealand (NCNZ) requires nurses to demonstrate competence in their practice, as evidenced through a portfolio of practice (NCNZ, 2016). In the nursing context, a portfolio is "an organised collection of professional work that follows the trajectory of a nurses' [*sic*] career that should illustrate the background, skills and expertise of the individual" (Green et al., 2014, p. 1). Therefore, practicing nurses are required to have skills in developing and maintaining a portfolio. This is relevant to undergraduate nursing students, as they are required to develop one or many portfolios as evidence of their emerging practice. A study by Collins and Crawley (2016), however, found that while 15 of the 16 nursing schools in New Zealand were using a portfolio, only two of these schools were using an ePortfolio.

Garrett et al. (2012) cited the elimination of physical size restrictions as one of the benefits of completing a nursing portfolio electronically. In many undergraduate nursing courses, such as the one involved with this research study, a paper "learning" portfolio has traditionally been completed for each clinical placement. This paper portfolio was more often than not produced in an A4 ring binder folder, including numerous sheets of paper and organized according to course requirements.

When examining international ePortfolio literature specifically related to undergraduate nursing courses, there appears to be a varying amount of success. Two studies reported the use of their own, internally created ePortfolio platform (Garrett et al., 2012; Karsten, 2012), while the other used a commercially purchased platform (Birks et al., 2016). All of these authors mentioned implementation difficulties. Birks et al. (2016) stated that difficulties arose in relation to technology, expertise, and faculty attitudes. Garrett et al. (2012) cited access to a computer and networks as a barrier to achieving success. All of the studies however, cited a number of advantages. Garrett et al. (2012) listed benefits including increased security, data storage/backup advantages, the ability to add digital data

and multimedia artifacts, the ability to include hyperlinks, and enhanced interaction and feedback with instructors. Birks et al. (2016) also stated that ePortfolios allow the user to develop a variety of information, as well as potentially to generate career opportunities. Karsten (2012) cited McCready (2006), in stating that

> the ePortfolio provides the student with a vehicle that can present a compilation of their work, provide an opportunity for reflection, and demonstrate clinical competence that provides a link between the knowledge students gain in the classroom with the knowledge students gain from the clinical experience. (p. 23)

This is certainly an intended goal for the introduction of ePortfolios within the institution involved in this study.

Garrett et al. (2012) stated a valid point when they said that developing and using an ePortfolio should not shift the focus from the learning that the student is engaging with to the piece of technology that they are using. This should be considered by all users of an ePortfolio platform. Birks et al. (2016) provided further caution by highlighting that there was limited evidence to confirm their effectiveness. Therefore, this current study has been developed to provide evidence of the effectiveness of introducing ePortfolios into the undergraduate nursing program. The platform in this case was Pathbrite (www.pathbrite.com).

Consideration also had to be given to how the platform was to be implemented, and there is some advice in the literature for those embarking on such a project. Wassef, Riza, Maciag, Worden, and Delaney (2012) discussed implementing an ePortfolio in a graduate nursing program. These authors stated that the two obstacles with which they were faced were the initial time investment and changing the mind-set of the students and faculty about using ePortfolios. Andrews and Cole (2015) also commented that implementation of an ePortfolio platform is time-consuming. Institutional support is also invaluable to the implementation of an ePortfolio, the importance of which is evidenced in the literature (Slade, Murfin, & Readman, 2013; Luera, Brunvand, & Marra, 2016; Andrews & Cole, 2015). All of these challenges to implementation of this new piece of technology needed to be considered.

Method

Institutional Context

In 2014, faculty from the School of Nursing explored the possibility of introducing ePortfolios into the Bachelor of Nursing program. This commenced with exploring the literature and surveying other nursing schools in New Zealand (Collins & Crawley, 2016). Once this process was complete, a lecturer who championed this initiative (EC) approached the Otago Polytechnics online learning team. Faculty from the School of Nursing, working in partnership with the Online learning team, explored a number of ePortfolio platform options. A comparison matrix guided the OP Online team in selecting an eportfolio platform, which met the required criteria within a reasonable budget and with limited commitment, to allow a six-month trial. Pathbrite was chosen as the preferred platform, and faculty training soon commenced. The "courses" version of the Pathbrite platform was introduced into year-one and year-two of the Bachelor of Nursing program in 2015.

One researcher managed the in-school nursing specific aspects of the pilot, the construction of templates, education of staff and students, and any problem solving that was needed. Another researcher managed the integration of Pathbrite into Moodle, problem solving and sharing information with other members of the online education team and IT staff so that staff and students would be supported. Direct assistance was also given from staff at Pathbrite, including training and problem solving.

Sample and Participant Selection

Ethics approval was granted in 2015 by the Otago Polytechnic Ethics Committee. Convenience sampling was used, and students were recruited into the study through an e-mail invitation to participate in the survey and subsequent focus group. A notification was also posted on the learning management system. Seventy-two students and 15 faculty chose to complete the survey. Seven students and five faculty chose to participate in the focus groups. The surveys were accessed via links to Qualtrics surveys.

Research Design

A mixed-methods sequential explanatory design was used in this study (Ivankova, Creswell & Stick, 2006). This approach was chosen to maximize the data that could be gleaned from a relatively small sample size. The quantitative data were gathered first from a survey of students and a similar survey of faculty. After the surveys were completed, focus groups were conducted, in which questions that had emerged from the survey results were posed to the participants. A model developed by Ivankova et al. (2006) was used to produce a visual representation of

Table 1
Visual Model for the Current Research Design

Phase	Procedure	Product
Quantitative data collection	Survey based on TAM distributed electronically to all 1st and 2nd year Bachelor of Nursing students and faculty in 2015, using Qualtics; *n* = 72 (students), *n* = 15 (faculty)	Numeric data
Quantitative data analysis	Data reviewed using SPSS software	Statistics
Connecting Quantitative and qualitative phases	Refinement and development of focus group questions	Focus group outline
Qualitative data Collection	Focus groups with students (*n* = 7) and faculty (*n* =5)	Text data
Qualitative data analysis Integration of the qualitative and quantitative results	Thematic analysis using TAM Interpretation and triangulation of the results using the technology acceptance model as framework	Cross thematic matrix Discussion, Implications and Future direction

this study (Table 1), using the mixed-methods sequential explanatory design.

The survey and focus group questions were based upon the Technology Acceptance Model (TAM). The TAM (Davis, Bagozzi & Warshaw, 1989) seeks to understand mitigating factors when introducing a new piece of technology. It has been stated that the success of a system can be determined by user acceptance of the system, measured by these three factors: perceived usefulness, perceived ease of use, and attitudes towards usage of the system (Shroff et al., 2011). Andrews and Cole (2015) considered the TAM in their study, which had also looked at ePortfolios in undergraduate nursing education. Their study highlighted the importance of planning, implementation, review, and evaluation when introducing a new piece of technology. Posey et al. (2015) stated that successful implementation of a new piece of technology, such as an ePortfolio, depends on acceptance and adoption by the end user. The use of the technology acceptance model is helpful in determining that acceptance.

Quantitative Data Collection

Both student and faculty surveys were deveand loped based on survey tools used in previous research that had utilized the TAM whose reliability had been demonstrated (Andrews & Cole, 2015; Shroff et al., 2011). Cronbach's Alpha was used to determine the internal validity of each factor in the student survey tool (Gliem & Gliem, 2003). All alpha values indicated acceptable internal validity ($\alpha > 0.7$). However, given the much smaller sample size of the faculty survey tool (*n* = 15), the researchers did not see Cronbach's alpha as a significant measure. The faculty survey tool was seen as acceptable based on its close relationship to established tools, its similarity to the structure of the student survey tool, and the fact that it was triangulated with qualitative data at a later stage.

The data for each of the categories of the TAM are presented in Appendix A for students and in Appendix B for faculty. The extent to which Pathbrite was seen as acceptable was used as a measure of whether the implementation of the ePortfolio platform was effective. The mean was used as a measure of the acceptability at a factor level. As a score of three is the midpoint on the Likert scale used, a mean of greater than three, but less than four, indicated a general agreement that Pathbrite was acceptable. A mean of four or higher was considered an indicator of Pathbrite being highly acceptable. When analyzing the individual items in the survey, the mode and the standard deviation provided more useful information about the extent to which Pathbrite was accepted. This was further informed by the integration of the qualitative data.

Qualitative Data Collection

The student focus group had seven participants, and there were five participants in the faculty focus group. The invitation to join the student focus group was sent by e-mail, as well as via the learning management system. Faculty were e-mailed an invitation.

As per the sequential explanatory research design, there was an initial set of questions to ask at the focus groups, which were modified and enhanced by integrating the outcomes of an initial analysis of the survey data. The focus group discussions were recorded and then transcribed.

The surveys included several open response questions that did not lend themselves to quantitative data analysis.

The text generated by these questions was added to the qualitative data analysis. The transcript and survey text were then analyzed with conventional content analysis (Schneider, Whitehead, LoBiondo-Wood, & Haber, 2016), using Nvivo analysis software. This was seen as an appropriate method because it allowed the factors of the TAM to be used as initial themes (usefulness of the ePortfolio platform, perceived ease of use, attitudes and behavioral intentions toward the Pathbrite ePortfolio platform), while allowing other themes to emerge.

Integration of Qualitative and Quantitative Results

The analysis of the quantitative data from the survey was kept separate from the analysis of the qualitative data gathered from the focus group transcripts and the open-ended responses from the survey. The results from both qualitative and quantitative analysis were then integrated around the factors of the Technology Acceptance Model (TAM), to show the extent to which the ePortfolio platform was accepted by the students and faculty. The student data and the faculty data were analyzed and presented separately.

Results

The survey and focus group data were integrated in two strands: student results and faculty results. This allowed the two main perspectives to be understood prior to discussion of the implications of the results. This section presents the results of that integration.

Student Results

Perceived usefulness of ePortfolio platform. Several survey and focus group questions concentrated on the perceived level of usefulness of the ePortfolio platform. Perceived usefulness can be described as "the extent to which a person believes that using a system will enhance their performance" (Davis, Bagozzi, & Warshaw, 1989, p. 985). The data relevant to perceived usefulness still indicated that Pathbrite was accepted as being useful ($M = 3.44$). Key themes that emerged were improved learning, increased security/privacy, reduced cost, and the ability to share with future employers. Two themes that suggest that Pathbrite was less useful were also identified: missing a hard copy and low quality feedback. The results supporting each of these themes are described in turn.

Improved learning. 42% of students who had completed a paper portfolio in the past indicated that an ePortfolio supported their learning better than a paper-based portfolio (37% neither agreed not disagreed). This improved support of learning was identifiable in four specific themes that emerged from the qualitative data: improved reflective learning, more and better feedback, ability to monitor own progress, and increased IT literacy.

An increased level of reflective learning was apparent in the survey responses (45.2% agreed or strongly agreed). In particular, as one student noted, the ePortfolio was seen to "increase the understanding [I] gained from [my] placements." One student articulated the benefits for their reflective practice very clearly:

> It encouraged you to reflect on your experience and look at it from a different point of view. It made me more aware of the competencies and encouraged me to think how these relate to practice. It taught me a lot of new skills like taking a health history, ecomap, genogram and also allowed you to use the models which are spoken about in 505, e.g., Pender & Ottawa Charter, which helped me to understand them more and how you relate them to your practise.

The majority of students (52.7% agreed or strongly agreed) felt that the feedback they received was what they needed in order to improve their practice (28% neither agreed nor disagreed). They also identified the ability to upload work and get formative feedback prior to summative assessment and the ability to upload work for faculty to view before a meeting. Features available in Pathbrite, such as "highlighting, speech bubbles, and annotations," were seen as important in delivering feedback. One student summed this up by identifying that "lecturers were able to access my work easily and comment without us having to meet up, so if there was a problem with my work it was easy to fix before summative [assessment]." The learning was also seen to support what was expected of graduates as professional nurses in terms of competencies (66% agreed or strongly agreed) and maintenance of registration (52% agreed or strongly agreed).

The ability to monitor one's own progress as each set of submissions was uploaded was identified as motivating and reassuring, as students liked "knowing when I've done what I need to do."

Students described the need to become more IT literate as a nursing professional in a "digital age," as a specific learning outcome that the ePortfolio platform supported.

Increased security. As the content of many of the ePortfilios was of a sensitive medical or professional nature, the ability to maintain security of the ePortfolio was identified as useful in the focus group. One student described the security risk of leaving a paper copy lying around or losing it. Another described their laptop failing and the security provided by a cloud-based portfolio as being reassuring.

Reduced cost. Several students in both the survey and the focus group referred to savings due to reduced printing costs as a useful feature for them. Some added

that the ePortfolio was also a more sustainable option due to the reduced use of paper.

The ability to share with future employers. Being able to share learning and experience through the ePortfolio was identified as useful in the student focus group. This was seen as relevant in the context of New Zealand district health boards and international employers.

Missing a hard copy. Students identified a preference to have a hard copy of their portfolio. The reasons for this were described as "a hard copy adds value to your work-but online it is just sitting there and means nothing," and that an online ePortfolio has "less sense of accomplishment."

Low quality feedback. While the mean response to the question about feedback indicated that the level of feedback was acceptable (M = 3.35), there was a large number of students who neither agreed nor disagreed (27%). Several students also referred to concerns about the quality of the feedback in both the survey and the focus group. Concerns included that "lecturers did not comment on the work uploaded so you did not know if it had been read or approved," that students did not receive any feedback, that they did not get notifications about feedback, and that the feedback received was not specific enough. A specific issue raised was that the use of Pathbrite's feedback functions was inconsistent between lecturers. One student described the frustration this caused as follows:

> Not all of the lecturers used it consistently through different courses and this made it confusing; some commented through the weeks, and I could change the work according to the feedback. Some didn't, so I was unaware if I was on the right track.

The integration of the survey and focus group data suggests that the students found the usefulness of the ePortfolio platform acceptable in the areas of improved quality of learning, reduced costs, increased security, and the ability to share the ePortfolio with future employers. However, weaknesses were recognized in the quality of online feedback and some students' desire for an annotated hard copy.

Perceived ease of use. Perceived ease of use can be described as the "extent to which a person believes that using a particular system would be free from effort" (Venkatesh, 2000, p. 344). The survey questions focusing on the ease of use of Pathbrite indicated that students found the ease of use of the platform acceptable (M = 3.38). Five themes emerged that described the extent to which Pathbrite was seen as easy to use: user experience design, feedback functions, management of workflow, training and support, and reliability. Each of these is addressed in turn.

User experience design. During the focus group, the students used positive language about the ease of use, such as "easy to use," "enjoyable," and "pretty straightforward." A total of 58% of students agreed or strongly agreed that it was easy to use. Specifically, they said that the ePortfolio was completed more quickly than a paper portfolio, that it was simple to arrange and achieve a good presentation standard, easy to upload evidence, and easy to find things because they were all in one place. However, several students commented that it was difficult to navigate when viewing Pathbrite through Moodle, or when they encountered windows within windows. Pathbrite runs best in Google Chrome. This created issues for some students who were used to using other browsers.

Feedback functions. Students appreciated that it was "easy for tutors to access and assess" their work. Some described it as being easy to replace their work based on feedback, and others described it as a difficult task. This split of opinion was also reflected in the survey, where 54% disagreed or strongly disagreed that it took a long time to learn how to use Pathbrite for assessments. In the survey and the focus groups, students repeatedly referred to problems with notifications. The source of these problems was either that the important notifications about feedback were lost among the numerous irrelevant notifications or that there were no relevant notifications. During the focus group, several students indicated that they were not aware of the notifications feature at all.

Management of workflow. Pathbrite was seen to support students in managing their work. One student explained that "it was an easy way to keep track of my work . . . like having a checklist of things to do." Time was seen as easier to manage, as there was no need to come to campus to hand in a hard copy. The flexibility of choosing location and time to access the portfolio was described as making the process much easier.

Training and support. While the survey data indicated that it did not take a long time to learn how to use Pathbrite, several students described initial difficulties in using it. For example, one student described a "total lack of prior instruction, which led to frustration at having to learn how to use a system prior to providing evidence of learning." Others referred to it taking "extra time" and being "hard to learn" to use Pathbrite.

Despite these negative comments, the survey data indicated that students had accessed a variety of sources of support. In order of the number of students who had used each source of support, they were: lecturers (50 students), peers (49 students), online Pathbrite resources (nine students), Pathbrite online support desk (three students), and Otago Polytechnic IT support desk (three students). A total of 57% of students agreed or strongly agreed that they had enough support to use Pathbrite effectively, while only 16% felt that they did not have enough support.

Reliability. The reliability of being able to upload or access Pathbrite was described as affecting adversely the ease with which it could be used. Two issues were described: long or unsuccessful uploads and system crashes. Students indicated that in some cases, "it took up to 30 minutes to upload" evidence, and they were "never sure whether it was going to be working or not."

Attitudes toward the ePortfolio platform. Attitude can be described as being disposed to respond in a particular way. The cognitive attitudes described in this data relate to constructed thoughts or ideas that influence responses in line with Teo (2009).

Overall, students felt positively towards Pathbrite. From the survey items measuring attitude towards Pathbrite, there was a mean score of 3.44, which indicates that they saw it as acceptable**.** This positive cognitive attitude was composed of many constructed thoughts around Pathbrite. A total of 61% of students disagreed or strongly disagreed that it just created extra work and did not help learning, and 64% of students felt positive about using it again. Factors that contributed to this positive attitude included: accessibility and convenience, sustainability, the ability for lecturers to view work before meeting with students, and the ease of viewing work gathered in one location. Factors that detracted from the positivity included: technical problems, difficulty of use, and difficulty in seeing feedback. In closing the student focus group the students agreed with the general comment that they felt "generally positive, with some more training required."

Behavioral intentions towards the ePortfolio platform. Where cognitive attitude refers to specific beliefs, behavioral intention relates to conscious plans to act in a certain way. The survey items measuring behavioral intention indicated that the students intended to continue using Pathbrite (M = 3.44). 60% of students were considering using Pathbrite to share their work with potential future employers. A total of 51% of students intended to use Pathbrite to demonstrate their ongoing competence to the Nursing Council of New Zealand.

Faculty Results

Usefulness of the ePortfolio platform. The survey data indicated that faculty found Pathbrite very useful (M = 3.71). From survey and focus group data four themes emerged: providing better feedback, promoting professional practice, supporting academic quality, and supporting sustainable practice. Each is described in turn.

Better feedback. A total of 80% of faculty agreed or strongly agreed that Pathbrite supported quality feedback for students, and 87% agreed or strongly agreed that Pathbrite supported timely feedback from faculty. In the open-ended survey questions and the focus groups, faculty suggested that Pathbrite not only increased the amount of formative feedback students received, but also led to more specific feedback being delivered in context. For example, one member of faculty described the "ability to easily provide formative comments, suggestions etc. to specific areas of student text." Several members of faculty described the ability to provide feedback before a meeting as useful.

Promotion of professional practice. A total of 80% of faculty claimed that Pathbrite established a portfolio that students could use to maintain their registration with the Nursing Council of New Zealand. It was suggested that the professional presentation of learning that Pathbrite produced supported this goal. A total of 60% of faculty supported the idea that Pathbrite increased the student's understanding of the professional competencies required of registered nurses, which aligned with two external factors: that New Zealand DHBs (District Health Boards) "are going to ePortfolios for evidence" and that Nursing informatics is "the way of the future."

Supporting academic quality. Several faculty referred to the fact that because all assessments/portfolios are on one shared system, moderation of marking was easy. Faculty indicated that the marking was "transparent" and led to "better consistency."

Supporting sustainable practice. The fact that students did not need to print a hard copy for submission and that faculty did not need to print any annotated copies to deliver feedback was seen by many faculty as making the whole exercise more sustainable. This sustainability included a reduced need for students to travel, as no hard copy had to be handed in and sustainable work patterns for faculty, as the cloud-based platform allowed more flexibility as to where and when marking or feedback could be worked on.

Perceived ease of use. While the survey items measuring ease of use indicated that faculty accepted that Pathbrite was easy to use (M = 3.44), one question that asked whether Pathbrite was easy to use contradicted this (M = 2.92). Therefore, it was necessary to examine in more detail the individual items within this factor. Four themes emerged from that analysis: user experience design, training and support, workload, and reliability.

User experience design. Faculty used positive language about using Pathbrite, such as "easy to use," "easy to navigate," "user friendly," "efficient and fast," "easy to give feedback," and "easy to use from home."

Training and support. A total of 60% of faculty felt that they had enough support to use Pathbrite effectively. This support mainly came from peers. The member of the faculty coordinating the implementation was described as having "committed as huge amount of time to supporting [us]." There was only one member of the faculty that reported using the Pathbrite help desk. It was noted that the institution's own help desk faculty were not yet familiar with the platform.

Workload. Several faculty indicated that using Pathbrite to provide formative feedback had increased their workload significantly. One suggested that their work had increased by "two hours per week," while another suggested that the time they had spent providing feedback had doubled. This was balanced by the suggestion that if they "can use things like feedback more effectively, then we are getting more value for the extra time." A total of 67% of faculty supported the idea that Pathbrite made it more efficient to provide high quality feedback.

Reliability. Faculty referred to specific difficulties with uploading feedback, students uploading evidence, and notifications either being irrelevant or not being received. There were some faculty who felt inconvenienced by having to use Chrome, rather than their normal preferred browser, as their internet browser. There was a significant issue in that while Pathbrite can be viewed using mobile devices, the marking and feedback functions would not work on an iPad. One member of the faculty described this in context by saying, "during hospital supervisions I wanted to mark on my iPad, while observing [the student] at the hospital." This also adversely affected part-time faculty, who were not supplied with a work laptop, as the full time faculty were.

Attitudes to the ePortfolio platform. Faculty presented positive attitudes towards Pathbrite in both the survey and focus group. They described "enjoying" it and affirmed that "it's a really good system" and that the "impression . . . has been overall positive." The survey items in this factor also consistently supported this (M = 3.71, SD = 0.45). The positive attitude was supported by the fact that Pathbrite was seen as sustainable, as supporting moderation, and as allowing faculty to view students' work before meeting them.

Behavioral intentions toward the ePortfolio platform. On the survey, 80% of faculty felt positively about using Pathbrite again, 73% of faculty would choose to use Pathbrite for assessments in the future, and 60% of faculty supported extending the use of Pathbrite. This intention to continue the use of Pathbrite was strongly supported in the focus group, where faculty described it as "the way of the future," said that "it would be sad to go back [to paper portfolios]," and declared, "no going back, we need to move forwards." One member of faculty noted that they preferred paper portfolios because they "liked the smell of paper . . . and actually handing something physical in."

Discussion

The results above describe the extent to which, from the perspectives of students and faculty, Pathbrite was seen as an acceptable solution. There were significant similarities in the two perspectives, and distinct differences. This section discusses the implications of these similarities and differences and suggests recommendations to increase the extent to which students and faculty see Pathbrite as acceptable.

Both faculty and students perceived Pathbrite as useful. There was agreement that the use of Pathbrite improved learning through increased reflection, better feedback, more timely feedback, and the ability to support academic quality through moderation of assessment. Faculty and students saw that Pathbrite would have a positive impact on future professional practice and be useful for sharing with employers. Students valued the increased level of security compared to a paper portfolio. Faculty emphasised the increased sustainability of ePortfolio compared to paper based portfolios, while students valued the reduced cost. Several students expressed concerns about the quality of the feedback they had received. This implies a lack of consistency in how faculty are using the feedback features of Pathbrite. To maximize the usefulness of Pathbrite, it is suggested that faculty receive further support in the delivery of formative feedback through Pathbrite. This support could come from the institutional online learning unit, from the departmental educational technology champion, peers, or specific faculty who have shown leadership through their own competence in this area. The timing of this training should coincide with the need to deliver feedback rather than front-loaded at the start of term, when there are significant other challenges to workload.

Both faculty and students perceived Pathbrite as acceptably easy to use. There was agreement around features of the user-experience design, such as the ease of uploading evidence, accessing feedback, and using the structure to assist with managing workflow. However, there were significant concerns around difficulties in receiving notification that feedback had been given. Therefore, students were not receiving feedback in the timely fashion in which the faculty were providing it. Faculty felt that while the quality of feedback they were providing had improved, their workload had significantly increased. Both students and faculty expressed concerns about the reliability of the platform due to long upload times and system crashes. Students and faculty both expressed concerns that Pathbrite did not operate on iPads, which was the preferred device on hospital wards. These issues may have resulted in extra stress for both faculty and students. To manage these issues around ease of use, it is recommended that increased support is provided to students. For others implementing an ePortfolio platform, they should consider adequate support for users in setting up and ongoing use of the platform. The reliability issues should be monitored closely to identify whether the issue is related to the platform or to local technical infrastructure. Faculty workloads should also

be monitored to determine whether the increased workload was due to learning a new system or inefficiencies in the system, or whether the increased load was actually producing sufficient improvement to feedback to be justifiable.

Both students and faculty presented generally positive attitudes towards Pathbrite. This positivity was reduced to some extent for students, due to issues with ease of use. Faculty, however, were consistently positive, based on increased sustainability, ease of moderating marking, and the ease of viewing students work.

In alignment with the TAM, where perceived usefulness, perceived ease of use, and attitude are all positive towards a platform, so too was the behavioral intention to continue using Pathbrite (Shroff et al., 2011). Students and faculty both intended to use Pathbrite outside of their study, and they supported both the continued use of Pathbrite in future years and extended use across the program. We found that using TAM within this study was beneficial and that it gave the researchers clear direction as to what we needed to evaluate. Using TAM gave us clear evidence that the implementation of the platform was successful, and we would recommend that others use TAM to evaluate their implementation processes.

Based on the discussion above, the implementation of Pathbrite was sufficiently successful for a recommendation that the use of Pathbrite be continued and extended across the Bachelor of Nursing program. However, there are some aspects that may be useful for others to consider if intending to incorporate a similar piece of technology into teaching and learning. As discovered in the results of this study, ongoing support and resourcing was highlighted by staff and students as an aspect of the implementation process that needs to be addressed. This has also been a concern from others who have embarked on similar journeys (Andrews & Cole, 2015; Luera et al., 2016; Slade et al., 2013). The significant time investment of the staff involved in the implementation of the platform should also be managed appropriately. This was a concern in this implementation, as well as in others (Andrews & Cole, 2015; Jones, Sackett, Erdley, & Blyth, 2007; Wassef et al., 2012).

Going forward, the faculty will continue to monitor the level of support and resourcing dedicated to appropriate and meaningful use of this platform. It is also the intention that this research will inform others in undergraduate nursing practice. Highlighting our experiences for local, national, and international groups is intended. This research also provides evidence to inform the use of the Pathbrite platform, which we will continue to evaluate and further develop.

Conclusion

The question posed at the beginning of this project was to evaluate the implementation of this new piece of technology and determine its ongoing use. This study showed that faculty and students enjoyed using Pathbrite ePortfolio system to present and assess clinical placement work and saw value in doing so. As a result of this study, the implementation of an ePortfolio platform appears to be a success, and faculty and students would like to continue using it. However, you could also deduce that there was not overwhelming support of the system, due to a number of challenges that it posed. It is now the authors' job to ensure that the ongoing use of this platform is more than agreeable to both faculty and students. This intends to be done through feedback, user education, and an ongoing, dedicated development plan.

References

Andrews, T., & Cole, C. (2015). Two steps forward, one-step back: The intricacies of engaging with ePortfolios in nursing undergraduate education. *Nurse Education Today, 35*(4), 568-572. doi:10.1016/j.nedt.2014.12.011

Birks, M., Hartin, P., Woods, C., Emmanuel, E., & Hitchins, M. (2016). Students' perceptions of the use of ePortfolios in nursing and midwifery education. *Nurse Education in Practice, 18*, 1-6. doi:10.1016/j.nepr.2016.03.003

Collins, E., & Crawley, J. (2016). Introducing ePortfolios into nursing schools. *Kai Tiaki Nursing New Zealand, 22*(5), 34-35.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982-1003.

Garrett, B. M., MacPhee, M., & Jackson, C. (2012). Evaluation of an ePortfolio for the assessment of clinical competence in a baccalaureate nursing program. *Nurse Education Today*, *33*, 1207-1213. doi:10.1016/j.nedt.2012.06.015

Gliem, J. A., & Gliem, R. R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. *Proceedings of the Midwest Research to Practice Conference in Adult, Continuing, and Community Education, USA*, 82-88.

Green, J., Wyllie, A., & Jackson, D. (2014). Electronic portfolios in nursing education: A review of the literature. *Nurse Education in Practice, 14*(1), 4-8. doi:10.1016/j.nepr.2013.08.011

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods, 18*(1), 3-20. doi:10.1177/1525822X05282260

Jones, J. M., Sackett, K., Erdley,W. S., & Blyth, J. B. (2007). Chapter 13: ePortfolios in nursing education: Not your mother's resume. *Annual Review of Nursing Education, 5*, 245-258.

Karsten, K. (2012). Using ePortfolio to demonstrate competence in associate degree nursing students. *Teaching and Learning in Nursing, 7*(1)*,* 23-26. doi:10.1016/j.teln.2011.09.004

Luera, G., Brunvand, S., & Marra, T. (2016). Challenges and rewards of implementing ePortfolios through a bottom-up approach. *International Journal of ePortfolio, 6*(2). 127-137. Retrieved from http://www.theijep.com/pdf/IJEP235.pdf

Nursing Council of New Zealand (NCNZ). (2016). *Approved professional development and recognition programmes*. Retrieved from http://www.nursingcouncil.org.nz/Nurses/PDRPs

Posey, L., Plank, M. M., Snyder, R., Dinneen, P. L., Feuer, M., & Wiss, A. (2015). Developing a pathway for an institution wide ePortfolio program. *International Journal of ePortfolio, 5*(1), 75-92. Retrieved from http://www.theijep.com/pdf/IJEP167.pdf

Schneider, Z., Whitehead, D., LoBiondo-Wood, G., & Haber, J. (2016). *Nursing and midwifery research: Methods and appraisal for evidence-based practice* (5th ed.). Chatswood, Australia: Elsevier.

Shroff, R. H., Deneen, C. C, & Ng, E. M. W. (2011). Analysis of the technology acceptance model in examining students' behavioural intention to use an e-portfolio system. *Australasian Journal of Educational Technology, 27*(4), 600-618. Retrieved from https://ajet.org.au/index.php/AJET/article/view/940

Slade, C., Murfin, K., Readman, K. (2013). Evaluating processes and platforms for potential ePortfolio use: The role of the middle agent. *International Journal of ePortfolio, 3*(2), 177-188. Retrieved from http://www.theijep.com/pdf/IJEP114.pdf

Teo, T. (2009). Is there an attitude problem? Reconsidering the role of attitude in the TAM: Colloquium. *British Journal of Educational Technology*, *40*(6), 1139-1141. doi:10.1111/j.1467-8535.2008.00913.x

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research, 11*(4), 342-365. doi:10.1287/isre.11.4.342.11872

Wassef, M. E., Riza, L., Maciag, T., Worden, C., & Delaney, A. (2012). Implementing a competency-based electronic portfolio in a graduate nursing program. *Computers, Informatics, Nursing, 30*(5), 242-248. doi:10.1097/NXN.0b013e31824af6d4

EMMA COLLINS is a senior lecturer in the School of Nursing at Otago Polytechnic. She is a teacher of professional nursing and research and supervises students in clinical practice. Her research interests include nursing informatics, sustainability, and positive learning environments. Emma has a variety of nursing experience, predominately in paediatric nursing, in both inpatient and community settings. Her master's degree is in child and family nursing.

RAY O'BRIEN is the Acting Director of Learning and Teaching Development at Otago Polytechnic. He has worked as an educator in a range of contexts, including military leadership training, adventure tourism, business and learning in a digital age. His research and development interests center around authentic learning and learning that makes a difference. His master's degree is in e-learning, focusing on the centralization of e-learning resources development.

Acknowledgements

The authors would like to acknowledge the faculty of the School of Nursing, OP Online, and the students involved in this project.

Appendix A
Student Survey Data

Likert Scale:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Value	1	2	3	4	5

Student Survey of Perceived Usefulness of Pathbrite ePortfolio:

	M	*SD*	*N*
The ePortfolio assessment made me reflect more on what I have learned than I normally would have.	3.42	1.004	72
The feedback I received through my ePortfolio was what I needed to improve my practice.	3.35	1.037	72
The ePortfolio assessments have given me a clear understanding of the Nursing Council of New Zealand Competencies for Registered Nurses (2012).	3.72	.826	72
The ePortfolio assessments helped me understand what is required by the Nursing Council of New Zealand for maintaining my registration.	3.47	.872	72
I have completed a paper based portfolio in the past and the ePortfolio supported my learning better	3.22	1.127	54
Mean perceived usefulness	3.44	.764	73

Student Survey of Perceived Ease of Use of Pathbrite ePortfolio:

	M	*SD*	*N*
The ePortfolio software was easy to use.	3.31	1.185	72
It took a long time to learn how to use the ePortfolio assessment before I could do my assessment (Reverse scored).	3.36	1.066	72
I had enough support to be able to use the ePortfolio platform effectively	3.46	.934	72
Mean level of perceived ease of use	3.38	.849	72

When I needed help with the ePortfolio, the sources of help I used were:

- ISS support (3)
- Online direct to Pathbrite support (3)
- Online Pathbrite resources (9)
- My lecturers (50)
- My peers (49)
- Other:
  - I didn't need help
  - I didn't seek help from anyone or anything, I worked it out myself
  - I just figured it out myself

Student Survey of Attitude Towards Pathbrite ePortfolio:

	M	*SD*	*N*
Based on my experience of the ePortfolio platform this semester I feel really positive about using it again	3.64	.997	72
I think this type of assessment really increases the depth of the learning you get from your experiences	3.19	1.030	72
I think the ePortfolio just added work and didn't help me learn.	3.49	1.021	72
Mean attitude towards ePortfolio platform	3.44	.841	72

The best thing about the ePortfolio platform was (themed from open-ended responses):

- Accessible and convenient (12)
- Sustainable (8)
- Lecturers could view work prior to meeting up with student (7)
- Easy to view the work all in one place (7)
- Able to reflect back on the work (4)
- Easy to gain feedback from lecturers (3)
- Easy to understand and follow in terms of what was required (3)

The worst thing about the ePortfolio platform was (themed from open-ended responses):

- Technological problems such as uploading, connectivity, browser problems (11)
- Difficult to use (7)
- Difficult to see feedback from lecturers (7)
- Difficult to view (2)
- Lack of instruction and confusing (2)
- Lack of consistency from lecturers (2)

Student Survey of Behavioural Intention Towards Pathbrite ePortfolio:

	M	*SD*	*N*
I intend to use a Pathbrite ePortfolio in the future to show my competence to the Nursing Council of New Zealand.	3.41	1.014	70
I would consider using a Pathbrite ePortfolio to share with a potential employer.	3.46	1.017	70
Mean level of behavioural intention	3.44	.955	70

Appendix B
Faculty Survey Data

Faculty Survey of Perceived Usefulness of Pathbrite ePortfolio:

	M	*SD*	*N*
The ePortfolio assessment made it easier for me to promote reflective practice among the students.	3.20	.775	15
The ePortfolio assessment does not support quality feedback for students (Reverse scored).	3.80	.676	15
The ePortfolio assessment supports the provision of timely feedback for students.	4.00	.926	15
The ePortfolio assessments were structured in a way that gave students a clear understanding of the Nursing Council Competencies for Registered Nurses (2012).	3.60	1.056	15
The ePortfolio assessments established a portfolio that the students can potentially use in the future for maintaining their registration with the Nursing Council of New Zealand.	4.00	1.000	15
The Pathbrite ePortfolio platform supports learning better than a paper-based portfolio.	3.67	.724	15
Perceived usefulness scale mean	3.71	0.589	15

Faculty Survey of Perceived Ease of Use of Pathbrite ePortfolio:

	M	*SD*	*N*
The ePortfolio software was easy to use.	2.93	1.207	14
It took a long time to learn how to use the ePortfolio assessment before I could mark the students work (Reverse scored).	3.29	1.139	14
I had enough support to be able to use the ePortfolio platform effectively	3.64	.929	14
The Pathbrite platform made it more efficient to provide high quality feedback to students	3.71	.914	14
The Pathbrite platform made it easier to spot students who were struggling and need extra support.	3.64	1.008	14
Mean perceived ease of use	3.44	.698	14

Most Common Source of Help With ePortfolio for Faculty:

When I needed help with the ePortfolio, the sources of help I used were:

- Institutional support service desk (1)
- Online Pathbrite resources (2)
- My peers (15)

Faculty Survey of Attitude to Pathbrite ePortfolio:

	M	*SD*	*N*
Based on my experience of the ePortfolio platform this semester I feel really positive about using it again	3.87	.743	15
I think this type of assessment really increases the depth of the learning students get from their experiences	3.33	.617	15
I think the ePortfolio just added work and didn't help students learn (Negatively scored).	3.93	.458	15
Mean attitude	3.71	.452	15

The best thing about the ePortfolio platform was (themed from open-ended responses):

- Could view the work prior to seeing the student on clinical (4)
- Able to be used for moderation purposes (3)
- Sustainable and efficient (3)
- Work was displayed in one location (2)
- Able to give timely feedback (2)
- It provided structure for the student (2)

The worst thing about the ePortfolio platform was (themed from open-ended responses):

- Technological problems such as uploading, connectivity, browser problems (5)
- Cumbersome and confusing (4)
- Time consuming (3)
- Difficult to view, especially on an iPad (3)
- Students not using it properly (1)
- Difficult for students to view feedback (1)

Faculty Survey of Behavioural Intentions Towards Pathbrite ePortfolio:

	M	*SD*	*N*
I would support extending the use of Pathbrite ePortfolio.	3.60	.737	15
I would choose to use a Pathbrite ePortfolio assessment in the future.	3.87	.640	15
I would consider using a Pathbrite ePortfolio myself to show my own professional competencies.	3.53	.915	15
Mean behavioural intention towards ePortfolio platform	3.67	.678	15

Why did faculty intend to keep using Pathbrite ePortfolio (themed from open-ended responses)?

- Easy to navigate (2)
- Able to view work prior to seeing the students and therefore give formative feedback (2)
- It's the way of the future (2)
- Convenient (2)
- More professional (1)
- Moderation (1)
- Uniformity (1)