Scaffolding Students' Reflection in an ePortfolio-based Learning Environment

Pauline Roberts
Dorit Maor
Jan Herrington
School of Education, Murdoch University, Australia
P.Roberts@murdoch.edu.au

Abstract: This paper details a study within a doctoral research project that used an ePortfolio-based learning environment. The aim was to increase engagement of pre-service teachers in the process of reflection. The learning environment utilized the PebblePad ePortfolio platform to facilitate an *Enculturation Teaching Model* that included exemplars of good practice, opportunities to interact with other students, and activities designed to improve reflective skills. This paper examines the reported engagement of the students with the exemplar and activity prompts placed within the ePortfolio platform. The issues that arose throughout the implementation are also outlined including the use of other formats for assignment drafting, the lack of engagement with the voluntary activity prompts and the focus on reflective writing. The paper concludes with recommended changes to the environment for future iterations of this and similar teaching environments.

Introduction

Recent research into the use of ePortfolios in higher education has identified their potential to provide complete personal learning environments for teaching and learning (Barrett, 2005; Chesney & Marcangelo, 2010; Lorenzo & Ittelson, 2005). One major issue surrounding the implementation of such environments, however, is the requirement for ePortfolio-based learning programs to be introduced in a systematic way to maximize the chance of successful implementation (Housego & Parker, 2009). Correspondingly, the latest research into reflective practice has identified the need for a similar systematic approach (Barton & Ryan, 2012). This research project aimed to integrate the two areas of reflection and ePortfolio-based learning environments to scaffold the development of reflective abilities in learners.

The systematic approach for this research was guided by the *eLearning Lifecycle* (Phillips, McNaught, & Kennedy, 2011), and was developed as a series of cycles for implementation towards the development and evaluation of electronically-based learning environments. This process was developed based on the principles of both action and design-based research towards the identification of *design principles* for electronic learning environments (Phillips et al., 2011).

The doctoral research project upon which this paper is based involved the implementation of stages of a lifecycle within the platform of the PebblePad ePortfolio towards the development of an online learning environment. The teaching space was designed based on the *Enculturation Teaching model* (Tishman, Jay, & Perkins, 1993) that consisted of: exemplars of good reflective practice; the opportunity for students to interact with one another; and the provision of guided activities that targeted the development of the skills of reflection. This teaching model was introduced to the students via a series of prompts placed within a Blog-style format in an online teaching space to scaffold the development of reflective abilities.

This paper reports one aspect of the larger research project, specifically, the engagement the students reported with the exemplar and activity prompts placed within the teaching environment. It then discusses the issues that arose in examining those prompts that were used more frequently by the students and why, leading to identification of improvements that could be made to the ePortfolio-based learning environment.

Literature Review

ePortfolios have grown in use throughout higher education settings in the last decade. This has largely been driven by government policies, particularly within countries such as the United Kingdom, where their use is mandatory (Joyes, Gray, & Hartnell-Young, 2009). To date, the primary use of ePortfolio platforms has been for assessment against set criteria or competency standards (Raison & Pelliccione, 2006; vonKonsky, Oliver, & Ramdin, 2009). Ongoing developments in technology have afforded the opportunity for these platforms to be

used more extensively for teaching and learning purposes (Barrett, 2005). Since Barrett (2005) proposed the application of ePortfolio technology in this way, there has been an increase in the number of educational programs utilizing a variety of ePortfolio platforms. To date, however, there has been "no clear collated summary of the evidence for the educational effects of the use of portfolios in undergraduate education" (Buckley et al., 2009, p. 282) and the evidence on the effectiveness of ePortfolios is "scant" (Shepherd & Hannafin, 2011).

Shepherd and Hannafin, (2011) offered solutions through their research that included a systematic implementation of an ePortfolio framework with embedded support structures. Other researchers suggest the use of prompts and scaffolding (Reidinger, 2006); having a clear pedagogical focus (Owen, 2009) and attending to all levels of the ePortfolio process including the developmental, reflective and representational purposes of portfolios (Hiller et al., 2007). Congruously, these suggested foci are also common to recommended practices in the effective development of reflective abilities of students in higher education settings.

Penso and colleagues (2001) highlight that there are many definitions of *reflection*. A useful definition that can be broadly applied is "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusions which it tends" (Dewey, 1933, p. 9). The key element here is that reflection is a process that requires engagement to examine previous experience and beliefs in relation to theoretical principles.

Reflection is particularly important in the learning processes of pre-service teachers as they come to the university with a range of background knowledge and experience of their own education that must be "reconstituted in the context of becoming a teacher" (Beattie, 2001, p. v). Students require engagement and experience to connect the theory they are learning in their university classes with practice (McBride, Xiang, & Wittenburg, 2002) to enable them to take control of the decision-making processes of their work (Pedro, 2005).

In contrast to the ongoing discussion of the importance of reflection in teacher education, the time to effectively 'teach' the skills of reflection is not always allocated to the curriculum (Ryan, 2011) nor is the required scaffolding provided towards clear expectations of the use of reflective experiences (Ryan & Ryan, 2013). It has been stated that "unless reflection is taught and assessed…then reflective practice in the higher education context will remain superficial" (Barton & Ryan, 2012, p. 2) leading to pre-service teachers who *react* to events rather than *reflect* on them towards improvement (Gün, 2011).

Research into the development of reflection has increasingly signaled the need for programs that provide focused strategies (Penso, Shoham, & Shiloah, 2001) with ongoing support (Vazir, 2006) that attends to every level on the reflective continuum (Ryan, 2013). The recommendation is for the provision of multi-modal approaches (Barton & Ryan, 2012) with "explicit scaffolding" (Ryan, 2013, p. 154) to assist students to make the links from theory to practice (Penso et al., 2001). It is these scaffolded strategies that provide the focus of this area of the research project within the ePortfolio learning environment in the PebblePad platform. The research was specifically focused on ways an ePortfolio platform could provide an environment to scaffold the development of reflection in pre-service teachers in a University environment.

Methodology

There are two distinct areas of focus within the methodology employed in this research. The first is the use of the *eLearning Lifecycle* as the methodology to implement and review the electronic learning environment while the second is the *Enculturation Teaching Model* that guided the actual prompting strategies that were developed for the teaching environment. These two approaches are discussed in this section of the paper, as well as the outline of the data collection and analysis process that was employed in the study.

This research developed from the identified need for a systematic approach to the development of electronically-based learning environments and structured support for the development of reflection. The project was implemented with a cohort of 84 fourth year Bachelor of Education students in a metropolitan Western Australian university. The ePortfolio-based teaching environment was provided as part of a year-long course that required students to complete an action-learning project towards improvement in a self-selected area of their teaching.

The *eLearning Lifecycle* used as the research methodology was recently developed to utilize the principles of both action research and design-based research approaches to design, implement and review electronic learning environments to create environmental *design principles* (Phillips et al., 2011). The model was an applicable approach suitable for use across a variety of platforms, and as such was chosen to guide the implementation of this research project within the PebblePad ePortfolio platform. Table 1 provides the details of each stage of this model as outlined by the Phillips et al. (2011), and although this representation is linear, there is no expectation that each implementation would necessarily follow this process from beginning to end. The

model was designed to allow implementation of various phases determined by the individual research scenario (Phillips et al., 2011).

Table 1: eLearning Lifecycle (Phillips et al., 2011)

Design-based research phases		Analysis of problem	Development of solutions			Testing of solutions
Cycle	*Scenario*	*Analysis*	*Design*	*Develop*	*Implement*	*Questions to ask*
0		Analysis of problem				What is the problem and how can we solve it?
1	B		Design e-learning artefact	Document		How good is the design?
2	B		Refine design	Develop e-learning artefact	Initial trial	Does the e-learning artefact work technically as it should? How can it be improved?
3	C	Refine problem analysis	Design e-learning environment which embeds e-learning artefact	Develop e-learning environment	Pilot	Does the e-learning environment work as its designer(s) intended? How can it be improved?
4	C		Refine design	Revise e-learning environment	Deploy to students (full trial)	How can the e-learning environment be improved?
5	D	Refine problem analysis	Refine design	Revise e-learning environment	Deploy to students (live)	How well does the e-learning environment work to support student learning?
6	D		Refine design	Revise e-learning environment	Deploy to students (live)	How well does the e-learning environment work to support student learning?

For this research project, the identification of the problem (Cycle 0) was the impetus for the research. The implementation then progressed quickly through to Cycle 4. This process was expedited by the use of the commercially developed PebblePad platform (the artefact in Cycle 1) and the implementation of the project within an existing year-long course structure (the working with the artefact for Cycle 2). The initial trial and pilot implementation had been completed informally in previous iterations of the teaching unit with the pilot phase completed in 2011 (Roberts & Maor, 2012). The scenarios that are included as phases B, C and D in Table 1, relate to the example of the implemented lifecycle discussed in *Evaluating e-learning: Guiding research and practice*.

In refining the environment for implementation of the full trial of the environment at Cycle 4, the structured teaching model was introduced. The *Enculturation Teaching Model* developed by Tishman, Jay and Perkins (1995) was suggested as a model to enhance the dispositions of thinkers in education. There are a number of parallels between Tishman and colleagues' (1995) requirements for higher order thinking and those required for reflection (Wenzlaff, 1998), which prompted the trial of this model within the ePortfolio environment.

This model includes the use of exemplars of good practice, opportunities for students to interact with each other, and finally, activities aimed at the development of related skills (Tishman et al., 1993). The other supporting factor in the choice of this particular pedagogical model was the alignment of these components to a framework identified by Strampel and Oliver (2007) on the development of reflection through ePortfolios. The Strampel and Oliver (2007) framework recommends the provision of *learning resources* (exemplars); *learning supports* (interaction); and *learning tasks* (activities).

The learning environment was incorporated in the ePortfolio platform through a shared area called the *Gateway*. Within the Gateway, there was provision to upload resources and to create a *Gateway Blog* which was the mode chosen to facilitate the *Enculturation Teaching Model*. Within the Blog, the students were provided with a series of exemplar and activity prompts designed to improve reflective abilities (Colton & Sparks-Langer, 1993; Donaghy & Morss, 2007; Phillips & Carr, 2006; Spalding, Wilson, & Mewborn, 2002).The exemplar prompts provided the students with outlines of the assessment tasks and explicit instructions for the process of submitting work through the PebblePad platform. Students were able to personalize the workspace in

terms of layout options, with the aim of further engaging them with the platform and the e-Portfolio learning affordances. Figure 1 provides an example of one of the exemplar prompts used with the students.

Figure 1: Graphic of exemplar prompt

The Gateway Blog also provided the opportunity for students to comment and interact with one another, thereby enabling the second element of the *Enculturation Teaching Model* (Tishman et al., 1993). There were additional prompts that were included to encourage interaction amongst the student group.

The third area of the *Enculturation Teaching Model* was the activity prompts that were developed based on literature published on reflection (Phillips & Carr, 2006; Ryan, 2011; Spalding et al., 2002). Nine prompts were included to target the development of reflective strategies. Table 2 provides examples of three of the prompts provided to the students in the learning environment, including the name of the activity prompt, the published source of each prompt, and the purpose of each activity within the learning environment.

Table 2: Examples of the activity prompts provided

| Activity	Source	Purpose
Good teacher description	Phillips & Carr (2006)	The students are asked to describe and share what they think are the attributes of a good teacher.
4r reflective writing	Ryan, (2011)	This activity is a link to a platform for evaluating the level of reflection in student writing. Students completing these entries, and reflecting on their writing against the determined criteria can make improvements to the writing.
Reflective writing in the blog.	Spalding et al. (2002)	Reflective writing can promote reflective thinking because it is a permanent record of thinking, is an outlet for feelings and can open up dialogue.

The scaffolding prompts were provided to the students in two rounds of implementation to complete Cycles 4 and 5 during two semesters. The feedback collected throughout Cycle 4 resulted in two changes to the prompts for Cycle 5 (Roberts, 2012). In terms of the exemplar and activity prompts, the literature citation was added to the students' view of the activity prompts. This was added to demonstrate to the students the background of the activity as well as to allow them to further investigate that particular prompt if they wished.

The data collection for the research was a mixed methods approach that was completed at the conclusion to the course – the end of Cycle 5. Data collected included an online survey facilitated through Survey Monkey, examination of usage statistics that were generated by the PebblePad platform itself, and interviews of focus groups and selected individuals who had used the environment. This selection was based on the usage levels identified from earlier data types to examine viewpoints from a cross-section of users within the teaching environment.

This data was then examined using a constant comparative approach (Glaser & Strauss, 1967), coded from the components of the *Enculturation Teaching Model* and the *Framework for Teacher Reflection*. The findings discussed in this paper are based on the coding for the exemplar and activity prompts from the ePortfolio teaching environment in relation to the students' reported levels of engagement and the issues identified from the data in these areas.

Findings

The initial examination of the **usage statistics** generated by the PebblePad platform showed that the students appeared to be using the platform as modeled, although there were some interesting insights provided by the data. For the students to benefit from the teaching environment that was planned based on literature to best develop reflection, they first needed to engage with the strategies included in the ePortfolio platform. The graphic in Figure 1 identifies the number and type of assets that were created by the whole cohort of students (84) across the full study period of the course (28 weeks).
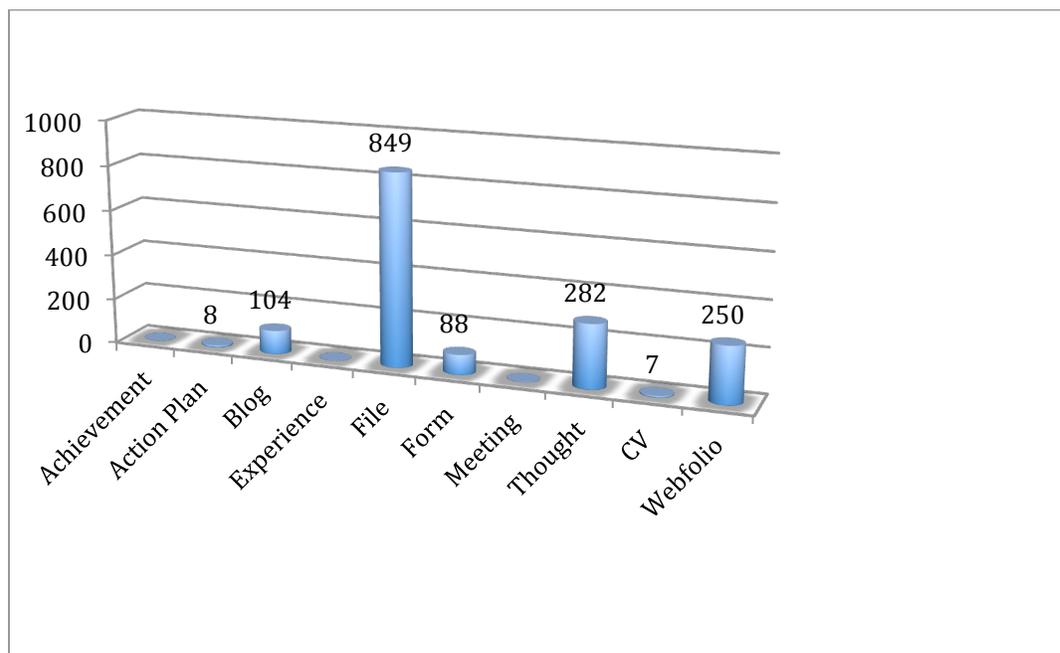
Figure 1: Assets created by the whole cohort by type and number

Each time a student creates a document in the PebblePad platform, it is recorded by the ePortfolio system as an *asset*. These are further categorized by the format type or style of the asset that is inherent within the platform. In the version used within this research, there was no flexibility to the formats of these asset types. The graphic provided shows that the students created 104 *Blogs;* 282 *Thoughts;* 250 *Webfolios* and uploaded 849 *Files*. When examined in relation to the exemplar prompts provided to the students, two key anomalies emerged that required further examination.

The first interrogation came from the creation of 104 Blogs by the student cohort. The students were provided with a prompt that directed them to set up an individual Blog to use for their reflective journals. Similar to many other online Blogs, this format allowed students to record reflective entries at any time. These entries were then stored together as a single *asset*. A prompt was designed for use by the students throughout their action learning projects to record incidents and actions from their experience as well as incorporate any relevant evidence. The difference with the PebblePad Blog over similar blogging formats was that each time an entry is posted to the Blog, it is also recorded within the platform as a separate *Thought* asset. The reason for this was to allow individual postings to be added to submissions or shared with others without requiring the student to share their entire Blog.

When the usage data was examined with this insight, what was originally thought to be a positive result of 104 Blogs created by 84 students was not so impressive. The creation of only 282 *Thoughts* across these student Blogs implies that the students were not utilizing these Blogs to a noteworthy degree throughout their action research projects. The creation of 282 *Thoughts* by the whole cohort could be viewed as an average of only 3.3 entries per student. However, when this phenomenon was further corroborated through other modes of data, many of the students commented that they were instead creating and maintaining their reflective journals in other formats and then either uploading the files to PebblePad or cutting and pasting the text from one platform to another.

This use of other platforms for drafting by the students aligned with the second area of inconsistency from the usage data. This was the count of the number of files uploaded to the PebblePad platform by this group of students. Within the ePortfolio platform, students were able to upload and save a range of file types to their asset store for addition to assignment submissions or for sharing with others. The uploaded files usually contained evidence of practice for the action research project or attachment documentation required for assignment submissions.

From the graph in Figure 1 of this cohort of 84 students, 79 of them had files uploaded to their asset stores totaling 849 individual files. These uploads included 453 Word documents (.doc and .docx), 139 pdf files, and 288 picture files (.jpg and .jpeg). The prompts within the Gateway Blog gave instructions of how to upload files as evidence for the projects however there were only two documents that were required as part of assignment submission. When the requirement of only two documents is considered, this figure of 849 files for the whole student cohort of 84 equates to an average of 10.7 files per student, which was unexpected and subsequently formed the basis of some areas of the ongoing data collection.

The uploading of such a large number of files was explained by the data from the online survey and interviews that further documented that the students were working in other formats such as Microsoft Word and accessing PebblePad towards the date of submission to transfer this information to their assignments. This transfer was done either as a file upload or through a "copy and paste" action of the text. The statistics collected by the PebblePad platform do not record entries that were completed with this "copy and paste" action, which would suggest that the use of other formats was even more pronounced than this data shows.

> A lot of it I was doing in Word then I was uploading it (Ma-Focus Group Interview 3)
> I did it all in a Word document and then I just copied and pasted it (K–Focus Group Interview 2)

The use of other formats and the resultant lack of ongoing engagement with the ePortfolio platform became the **first issue** further examined in the research. The students' use of other formats throughout the drafting of reflective journals and assignment submissions was problematic to the research investigation. If the students were not spending time working within the environment, it could be assumed that they were not connecting to the ePortfolio learning environment and thus not utilizing the full range of reflective prompts.

The reported use of other formats by the students for the drafting of the assignment components led to the examination of the student's engagement with the activity prompts placed within the environment. The data from the online survey implemented through Survey Monkey mentioned earlier was the primary source for this area as it documented the level of engagement the students reported having with all of the prompts placed within the ePortfolio teaching environment.

The **survey results** were gained from 25 of the student group of 79 who completed the course, which provides a return rate of 32%. Although this number is lower than expected, the trends identified in these responses were corroborated by other data collection modes, particularly the focus group interviews. One section of the online survey specifically asked the students to identify their level of engagement with the prompts within the environment based on a five point Likert-style scale with these choices: "did not look at"; "read only"; "read and used in project"; "completed the activity" and "shared with a peer". The differentiation

between the two levels of "read and used in project" and "completed the activity" was important to distinguish between the prompts being seen solely as part of assessment processes or whether they had value outside of assessment. Table 3 provides the results from the survey in which the students identified their use of the provided prompts on the predetermined scale, with the shaded sections of the table identifying the prompts that provided additional exemplars of assessment items as opposed to the stand alone activity prompts.

Table 3: Reported use of prompts by percentage.

Prompt Number	Prompt provided to students	Didn't Look	Read only	Read and Used in project	Read and completed	Shared
1	Reflection on teachers	46.7	46.7	6.7	0	0
2	Something to talk about	33.3	60	6.7	0	0
3	Reflective Journal as a Blog	26.7	53.3	6.7	13.3	0
4	Plan/Rationale Outline	6.7	13.3	66.7	13.3	0
5	Time to refine	40	40	13.3	6.7	0
6	Adding ethics checklist	6.7	6.7	60	26.7	0
7	Progress report	0	6.7	66.7	26.7	0
8	Uploading evidence	0	7.1	57.1	35.7	0
9	Reflective writing review	0	42.9	42.9	14.3	0
10	Outline of 4R Framework	6.7	33.3	60	0	0
11	Video Review	46.7	53.3	0	0	0
12	Verbal 3 step framework	42.9	57.1	0	0	0
13	Reflective journal review	20	60	13.3	6.7	0
14	Conclusion questions	26.7	26.7	40	6.7	0
15	Final report	0	0	73.3	26.7	0
16	Attachments	0	21.4	42.9	35.7	0

What these results showed was that the students were much more engaged with those prompts that provided the exemplars of good reflective practice in relation to the assessment items (the shaded prompts in the table). These prompts demonstrated higher reported usage with an average of 82.6% of students reporting using the exemplar prompts (either in the project or on its own). In addition, 100% of respondents reported the use of the exemplar prompt for the Final Report. This was in contrast to an average of 14.5% using the activity prompts that were there to provide additional strategies to develop reflection. This included two of the prompts *Video Review and Verbal 3-Step Framework* reported as not being used at all by the students who responded to the survey.

This highlighted the **second issue** that that arose from this level of the data review process that there was a decreased level of engagement with the activity prompts and the focus on reflective writing that was demonstrated through the usage of prompts 9 and 10 (see Table 3) that were targeted at that area. These issues subsequently became the focus of the ongoing data collection and review process to develop an understanding of why the students responded in this way.

Although many of these activity prompts had lower percentages of completion, many students responded that they had read the prompts (an average of 47.3%) but had not completed the activity due to time constraints. Every student in the focus group interviews reported that their workload in the fourth year of their degrees was much higher than previous years and that they did not have time to do any 'extra' work.

> I tried doing the first activity but then like it was just time (A–Focus Group Interview 1)
> As you'd know being a student before, you do as little work as possible--like you do all the bits that are required (T–Focus Group Interview 1)

The view that these voluntary activity prompts were extra and unnecessary work or that they were included in the environment to provide additional support to students who were having difficulty, created more problems that required further examination in the research process. When asked why they did not use the prompts, the students responded:

> I think if I was someone who is really struggling in those aspects I
> would have used them but I didn't feel I had to write it down (K–
> Focus Group Interview 2)
> But if someone wasn't quite getting that reflective process, then they
> could have used this and then it would have guided them for their
> assignments (Md–Focus Group Interview 2)

Of the activity prompts that were reportedly used by the students, the highest levels of engagement were with the Outline of the 4R framework (60%), and the Reflective writing review (57.2%). To the question of which prompts were the most useful in the environment, the students answered:

> The step by step instructions [were useful] also the 4Rs to guide my
> reflections (H11–OLS)
> 4R as it gave precise details of how to reflect (H24–OLS)
> We have the 4r's as well. That was good. I did use that one. (K–
> Focus Group Interview 2)

This reinforced the **third issue** of the research, which was the students' focus on the process of reflective writing. The prompts specifically mentioned by students related directly to the process of reflective writing, an issue also evident in the reviewed literature (Barton & Ryan, 2012; Ryan, 2011)) in relation to the difficulty faced by students in developing critical skills of good reflective writing. Many students commented in the open-ended questions in the online survey and in interviews that these prompts provided a strong scaffold to their writing and reinforced the need for a systematic approach to the process.

Conclusions and Recommendations

The three issues identified in the data and discussed here, specifically: the use of alternative formats and subsequent transfer of text to PebblePad; the lack of engagement with the activity prompts; and the focus on reflective writing, provided the basis for further examination of the environment. The further investigation in these areas provided recommendations for future iterations of the ePortfolio teaching environment.

In terms of the preference shown by the students in completing much of their work in other formats such as Microsoft Word, research has shown that students may be resistant to and find it difficult to change technology-based tools (Janosik & Frank, 2013). Even slight variations from the preferred Word format, may pose difficulties for students (Janosik & Frank, 2013) and often the effort required to adapt to the new platform is "seen by the students as time-consuming, burdensome and an addition to the main requirement of their course" (Buckley et al., 2009). This sentiment was strongly reinforced through the discussions in the student interviews and was identified as a barrier to engagement, not only with the PebblePad ePortfolio platform but also with the activity prompts. This meant that many students were maintaining their current models of reflection and not engaging with new strategies that may have assisted their development.

When examining the issue of engagement with the environment, it was found that for students to become engaged with the tasks provided in the environment, they need to see the value of the task (Janosik & Frank, 2013; Johnsen, 2012) and be reassured of the process through differentiation of the task to their needs (Edwards, 2013). They also require ongoing feedback (Kember et al., 1996), continual guidance (Johnsen, 2012) and regular reassurance (Janosik & Frank, 2013). Students will not voluntarily complete 'extra' work (Johnsen, 2012) so solutions need to be developed that provide motivation to complete these tasks in the new environment. Preferably, these solutions are not reliant upon assessing every aspect of the environment for credit, but perhaps involving the teachers more fully within the environment to provide the support and feedback identified as important contributors to engagement.

To enable this, a collection of activities could be developed within the platform in a similar way to the QUT DRAW project (https://wiki.qut.edu.au/display/draw/Home), that could be contextually implemented by teachers at the optimum time in the students' projects (Ring & Ramirez, 2012). If a prompt is introduced at the time of need, the perceived value to the student might be increased and provide motivation for them to complete the task. Continual exposure to this type of practice may eventually develop new habits.

The findings in this study reinforce the value of a structured, scaffolded approach to the development of reflection. The engagement with prompts showed the effectiveness of the environment to some degree in providing those scaffolds. If the strategies to increase the level of engagement discussed earlier were introduced and the collection of prompting activities is further developed as a component of the environment, perhaps the small success experienced in this research could be replicated and expanded in future iterations.

Based on these conclusions, the key recommendations moving forward would be to continue to build on the use of the ePortfolio-based learning environment including a wider implementation across courses and

cohorts of students, preferably from the first year of university study. This would involve the ongoing addition of contextualized prompts to build a collection that can be implemented at the point of student need and include more opportunities for ongoing feedback to be provided to the students within the platform. The promise shown in some areas of this research in terms of the usability of the platform as a learning environment and the adaptability of the teaching prompts provided, could be built upon and adapted to other electronic learning platforms as well as other skill and content areas beyond reflective practice.

References

Barrett, H. C. (2005). Researching electronic portfolios and learner engagement (White Paper). *The Reflect Initiative. TaskStream Inc*

Barton, G., & Ryan, M. E. (2012). Multimodal approaches to reflective teaching and assessment in higher education. *Higher Education Research & Development*. (In Press)

Beattie, M. (2001). *The art of learning to teach: Pre-service teachers narratives*. Columbus, OH: Prentice Hall.

Buckley, S., Coleman, J., Davison, I., Khan, K. S., Zamora, J., Malick, S., … Popovic, C. (2009). The educational effects of portfolios on undergraduate student learning: a Best Evidence Medical Education (BEME) systematic review. BEME Guide No. 11. *Medical teacher*, *31*(4), 282–298.

Chesney, S., & Marcangelo, C. (2010). "There was a lot of learning going on" Using a digital medium to support learning in a professional course for new HE lecturers. *Computers & Education*, *54*(3), 701–708.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. Lexington, Massachusetts: D.C. Heath and Company.

Donaghy, M., & Morss, K. (2007). An evaluation of a framework for facilitating and assessing physiotherapy students' reflection on practice. *Physiotherapy Theory and Practice*, *23*(2), 83–94

Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine

Gün, B. (2011). Quality self-reflection through reflection training. *ELT Journal*, *65*(2), 126–135.

Hiller, B., Pauschenwein, J., Sandtner, H., Sfiri, A., Porotschnig, B., & Ritter, G. (2007). Implementation Process of ePortfolio at FH JOANNEUM. In *Proceedings of the International Conference of Interactive computer aided learning ICL2007: EPortofolio and Quality in e-Learning*.

Housego, S., & Parker, N. (2009). Positioning ePortfolios in an integrated curriculum. *Education+ Training*, *51*(5/6), 408–421.

Janosik, S. M., & Frank, T. E. (2013). Using ePortfolios to measure student learning in a graduate preparation program in higher education. *International Journal of ePortfolio*, *3*(1), 13–20.

Johnsen, H. L. (2012). Making learning visible with ePortfolios: Coupling the right pedagogy with the right technology. *International Journal*, *2*(2), 139–148.

Joyes, G., Gray, L. & Hartnell-Young, E. (2009). Effective practice with e-portfolios: How can the UK experience inform practice? In *Same places, different spaces. Proceedings ascilite Auckland 2009*. http://www.ascilite.org.au/conferences/auckland09/procs/joyes.pdf

Kember, D., Jones, A., Loke, A., McKay, J., Sinclair, K., Tse, H., … Yan, P. W. (1996). Developing curricula to encourage students to write reflective journals. *Educational Action Research*, *4*(3), 329–348.

Lorenzo, G., & Ittelson, J. (2005). An overview of e-portfolios. *EDUCASE Learning Initative, Çevrimiçi sürüm*, *9*, 2011.

McBride, R., Xiang, P., & Wittenburg, D. (2002). Dispositions toward critical thinking: The preservice teacher's perspective. *Teachers and Teaching, Theory and Practice*, *8*(1), 29–40. doi:10.1080/13540600120110556

Owen, H. (2009). ePortfolios and unfamiliar spaces: Exploring the unknown, together. In *Same places, different spaces. Proceedings ascilite Auckland 2009*. http://www.ascilite.org.au/conferences/auckland09/procs/owen.pdf

Pedro, J. Y. (2005). Reflection in teacher education: exploring pre service teachers' meanings of reflective practice. *Reflective Practice*, *6*(1), 49–66. doi:10.1080/1462394042000326860

Penso, S., Shoham, E., & Shiloah, N. (2001). First steps in novice teachers' reflective activity. *Teacher Development*, *5*(3), 323–338.

Phillips, D. K., & Carr, K. (2006). *Becoming a teacher through action research: Process, context, and self-study*. New York: Routledge.

Phillips, R., McNaught, C., & Kennedy, G. (2011). *Evaluating e-learning: Guiding research and practice*. New York: Routledge.

Raison, G., & Pelliccione, L. (2006). Aligning assessment practices with long term outcomes in higher education. In *Enhancing Student Learning: 2006 Evaluations and Assessment Conference refereed papers*.

Reidinger, B. (2006). Mining for meaning. In A. Jafari & C. Kaufman (Eds), *Handbook of Research on ePortfolios* (pp. 90–101). Hershey PA: Idea Group Reference.

Ring, G., & Ramirez, B. (2012). Implementing ePortfolios for the assessment of general education competencies. *International Journal*, *2*(1), 87–97.

Roberts, P. (2012). Researching an eLearning Environment for Developing Reflection in Pre-service Teachers: Details of Cycle 4. In *Proceedings of Global Learn 2012* (pp. 98-103). AACE.
Retrieved from http://www.editlib.org/p/42048.

Roberts, P. & Maor, D. (2012). ePortfolios to Scaffold the Development of Reflective Practice in Bachelor of Education Students. In T. Bastiaens & G. Marks (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2012* (pp. 1274-1279). Chesapeake, VA: AACE.
Retrieved from http://www.editlib.org/p/41779.

Ryan, M. (2011). Improving reflective writing in higher education: a social semiotic perspective. *Teaching in Higher Education*, *16*(1), 99–111.

Ryan, Mary. (2013). The pedagogical balancing act: teaching reflection in higher education. *Teaching in Higher Education*, *18*(2), 144–155.

Ryan, Mary, & Ryan, M. (2013). Theorising a model for teaching and assessing reflective learning in higher education. *Higher Education Research & Development*, *32*(2), 244–257.

Shepherd, C., & Hannafin, M. (2011). Supporting Preservice Teacher Inquiry with Electronic Portfolios. *Journal of Technology and Teacher Education*, *19*(2), 189–207.

Spalding, E., Wilson, A., & Mewborn, D. (2002). Demystifying reflection: A study of pedagogical strategies that encourage reflective journal writing. *The Teachers College Record*, *104*(7), 1393–1421.

Strampel, K. & Oliver, R. (2007). Using technology to foster reflection in higher education. In *ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007*.
http://www.ascilite.org.au/conferences/singapore07/procs/strampel.pdf

Tishman, S., Jay, E., & Perkins, D. N. (1993). Teaching thinking dispositions: From transformation to enculturation. *Theory into Practice*, *32*(3), 147–153.

Vazir, N. (2006). Reflection in Action: constructing narratives of experience. *Reflective Practice*, *7*(4), 445–454. doi:10.1080/14623940600987015

vonKonsky, B., Oliver, B., & Ramdin, A. (2009). The iPortfolio: Capture, reflect, connect. In *Innovate, Collaborate, Sustain*. Presented at the EDUCAUSE Australasia Conference, Perth, Australia.