



Student perspectives of eportfolios: Change over four semesters

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Universities are currently under pressure to provide evidence of graduate attributes and at the same time to improve learner engagement. Eportfolios and their associated pedagogies have the potential to support students' learning and development and to provide evidence of their progress against standards or attributes. Research reports about eportfolio introductions provide guidance on this new technology however student voices are underrepresented and most studies occur over a single course. This paper reports early data from a three-year longitudinal study of students in a Bachelor of Education. Survey results across four semesters, which included first-time users in each semester, indicated (1) increasing recognition of the eportfolio for learning in the areas of evaluation, reflection on the learning process, and keeping track of learning experiences and (2) decreasing concerns about using the technology and technology as a barrier. There were also a steady increase of enthusiasm and positive feelings and a decrease in feelings of uncertainty, confusion, anxiety and negativity.

Keywords: electronic portfolios, longitudinal research, Mahara, student perspectives

Introduction

For some time, university graduates have been able to provide evidence of their degree capabilities solely through their university qualifications. Now, contemporary professional, and workplace communities and other stakeholders exert greater pressure on universities for more accountability (Clark & Eynon, 2009) as they increasingly demand graduates who can evidence their employability skills. This is now also well recognised within government policy contexts (Hallam, Harper, McGowan, Hauville, McAlister & Creagh, 2008). Universities must establish how best to respond to these demands, which are somewhat summative in nature while, at the same time, developing more personalised forms of learning which engage their learners and support their development as reflective professionals and confident and autonomous learners (Chau & Cheng, 2010).

Eportfolios have been identified as a technology which has the potential to benefit 21st century models of learning, teaching and assessment (JISC, 2008). While eportfolios bring digital advantages such as portability and flexibility, their use for learners also involves changes of habit, not only regarding the technology but also

the accompanying pedagogy. This raises challenges for tertiary teachers in terms of creating an engaging learning environment where students must not only understand the technology but, more importantly, its role in their learning and development.

The purpose of this paper is to present part of a larger project which is investigating student perspectives of eportfolios over three years. We present and discuss some early results from four semesters of questionnaire data. Perspectives over time are especially valuable for technology innovations because they can document change, growth and development, if any. A common theme in the eportfolio research literature is the impact of the eportfolio technology itself on the student experience. We are interested in the ways in which contextual factors in the learning environment not only influenced student perspectives of using the eportfolio technology but also their learning.

Eportfolios and Learning

Stefani, Mason and Pegler (2007) refer to portfolios as “another tool in the e-learning armoury” (p.7) and argue that the key concept is the potential of a portfolio approach to learning rather than any digital characteristics. The elasticity and flexibility of the eportfolio as a personal learning space which can have different roles over the lifespan leads them to identify the transformational potential of the technology, however, they note that the technology is still immature and widely and variously defined. We have adopted the JISC (2008) definition of an eportfolio because it seeks to integrate the technology with pedagogical processes:

“An eportfolio is the product, created by the learner, a collection of digital artefacts articulating experiences, achievements and learning. Behind any product or presentation, lie rich and complex processes of planning, synthesising, sharing, discussing, reflecting, giving, receiving and responding to feedback. These processes referred to here as ‘eportfolio-based learning’ - are the focus of increasing attention, since the process of learning can be as important as the end product” (p.6).

The JISC (2008) definition also attempts to conceptually connect the process and product roles of eportfolios and there is some support for this. In Chau and Cheng’s (2010) study of first time university eportfolio users, most students (and teachers) saw the eportfolio as supporting both the development of a product and the learning process. However, the researchers highlighted the tension between these two aspects and argued that the pressure to demonstrate criteria (such as university graduate attributes) could lead to ‘clone’ (p. 940) performances and suppress individuality and creativity which could be fostered when eportfolios were used in a more personalised fashion.

Eportfolios are generally located within a constructivist perspective (Stefani, Pegler & Mason, 2007; Barrett, 2005) and their pedagogies often feature reflective and evaluative approaches to professional development and learning (Lin, 2008). In the case of teacher education, the concept of the reflective practitioner is a professional and cultural cornerstone, and there is widespread acknowledgement in the literature of the use of portfolios to develop ‘habits of reflection and analysis’ (Zeichner & Wray, 2001, p.614). However, in some cultures and disciplines (Vernazza, Durham, Ellis, Teasdale, Cotterill & Scott, Thomason, Drummond & Moss (2011) students have found reflection to be a difficult process and Orland-Barak (2005) observes that the quality of the reflection is not necessarily influenced by the portfolio, and other processes such as collaborative discussions, can produce higher levels of critical reflective thinking. Eportfolios are also valued for their ability to provide more authentic forms of learning and assessment (Emmett, Harper & Hauville, 2006) although the role of experiential concepts and approaches to learning has received sparse attention in the eportfolio literature.

The literature on eportfolios emphasizes the potential of the technology to be transformational. However, the research into student perspectives indicates that there is often a gap between institutional and teaching visions and the reality of student experiences. Some studies have reported positive student perspectives. Lin’s (2008)

one year study of 38 student teachers reported, from survey data, positive attitudes to eportfolios and identified benefits for learning such as improved self assessment and reflective skills, enhanced organisational, synthesis and ICT skills, and the value of learning through peer collaboration. However, the students were enrolled in an ICT course where the focus of the paper and its learning and assessment strategies provided a rationale for the eportfolio for students. Bolliger and Shepherd's (2010) survey-based study of 40 students over two semesters also reported positive perceptions from students around the value of goal setting, evaluating progress, reflection and communication with peers and the teacher. Their students were engaged in postgraduate study and were distance students and these factors may have influenced their perceptions. Ring and Foti's (2006) study of 1025 student teachers identified benefits including raising consciousness of professional teaching standards, addressing the challenge of explaining the connection between their teaching practice and the standards and making links between theory and practice. They claimed that there was a shift in responsibility to their students and that eportfolios were transformational because students were engaged in new learning processes which involved making decision about their practice and then justifying and explaining them against standards. While the US university context has its own special characteristics, the findings of this study are noteworthy because of the size of the sample, and because this was a longitudinal study over four years.

Some studies have illustrated negative student views of eportfolios. One widely identified issue is frustrations around learning to use the technology (Lin, 2008; Singh & Ritzhaupt, 2006, Tosh, Light, Fleming & Haywood, 2005). The other commonly mentioned issue is demand on student time which is not only related to using the technology but understanding the associated pedagogy (Lopez-Fernandez & Rodriguez-Illera, 2009), especially regarding learning and assessment activities, particularly reflection (Vernazza et al, 2011), but also the role and value of collaboration (Carroll, Maukauskaitė & Calvo 2007). Singh and Ritzhaupt (2006) identified student resistance to the eportfolio arising from insufficient support and training, lack of understanding and buy-in from their teachers, an annual charge and a requirement to produce an eportfolio before graduation. Negative student perceptions have also been identified by Tosh, Light, Fleming and Haywood (2005) who identified buy-in, workload and inadequate assessment return, challenges in learning to use the technology and student motivation and engagement. Student opinions about the eportfolio were ambivalent in that while they did not think that the eportfolio was an obstacle in their study they did not think that working with it had assisted them in the course. The findings of this research are notable because this was a three-year study which followed the planned and phased introduction of eportfolios in one British and two Canadian universities.

Some studies have investigated psychological factors related to eportfolios. Researchers report that students may feel challenged and overwhelmed and express anxiety, confusion and uncertainty about the purpose and audience for the eportfolio (Lin 2008). Other student concerns are anxiety about the scope and nature of tasks, the absence of models, their general lack of preparedness for developing a creative and personal work (Darling, 2001). Also identified are teachers' expectations and requirements, keeping track of paper placement reports and then getting them into the eportfolio (Pincombe, McKellar, Weise, Grinter, & Beresford, 2009). In a relatively large study for this field (364 students), Tzeng (2010) highlighted the important role of student attitudes i.e. beliefs about the advantages of the technology and identified these as more important than perceptions of value around costs and benefits, usefulness and institutional support. Many studies endorse the importance of the broader context for the eportfolio in terms of the learning design and the role of the teacher in developing positive attitudes and addressing concerns and anxieties.

A range of methodologies have been used to investigate student perspectives of eportfolios with much of the research being insider research in the nature of case studies carried out by enthusiasts (e.g. Lin, 2008; Pincombe et al, 2009). Surveys have been carried out, however the numbers of participants have often been less than 100 students, with greater numbers of students being less common (Tzeng, 2010; Parker et al. 2009; Singh & Ritzhaupt, 2006; Tosh et al, 2005). With the exception of Tosh et al (2005), and Ring and Foti (2006), most of the studies we have located gathered data from a single semester and from a single class (e.g Lin, 2008) and did not survey students from a range of courses. Bolliger and Shepherd's (2010) results were based on data across two semesters and they observed that 'it was not clear how time would influence students' perceptions (p. 310). Housego and Parker (2009) have noted the limited availability of studies of longitudinal use of eportfolios and student perspectives. We argue that the area of development of student views of eportfolios over time is under-researched. This research study seeks to address this gap in eportfolio knowledge by investigating student

perspectives in a Bachelor of Education (Primary) programme across three years. The outcomes of this research will contribute (1) to pedagogical and institutional knowledge about eportfolios and (2) to better understanding of issues involved in students' adaption to new technologies.

The Research Study

The research discussed here is part of a larger study which was described at the ascilite 2009 conference (Gerbic, Lewis and Northover, 2009). The aim of the overall research is to investigate student experiences of eportfolios and their impact or otherwise on their learning. The research questions are:

1. How do students experience an eportfolio?
2. How does an eportfolio help students to learn?
3. What hindrances or challenges are there for students when they use an eportfolio in their learning?

Our intention is to investigate changes (if any) over time in student perspectives after the eportfolio is introduced. Part of the value of such a study is to consider the relationships between student changes of perception with the expansion of teacher understanding of the technology and the development of a responsive pedagogy. The project also enables us to see whether, with the passage of time, students can move past the technological and other challenges and become more confident learners with their eportfolios.

Context

The Mahara eportfolio (Eduforge, 2007) was first introduced into the B.Ed (Primary) programme in semester 1, 2009 to second year B Ed students and then extended into Years 1, 2 and 3 of the programme over the next 18 months. The eportfolio was initially embedded within the Practicum programme where it was used by student teachers while they were in schools to reflect on their teaching experience. It was also used for goal setting and self appraisal against teacher graduating standards and was assessed. In Year 1, students were introduced to the eportfolio, using it formatively to support goal setting and reflection.

In 2010, the eportfolio was introduced into a Technology course where it was used as part of a learning assessment. For the first two semesters, there were technical issues with the eportfolio software but these have now abated and a variety of training approaches (workshops, online and printed materials, teacher modelling and peer coaching) have raised overall student comfort with the technology. The teaching team has remained the same for four semesters, however their understanding of eportfolios has significantly increased and they have continued to extend and incorporate authentic eportfolio tasks across the programme. Building student understanding of the role and value of the eportfolio in their development as professional teachers has been embedded within the programme as a significant and an ongoing activity.

Methodology

This study has been designed as a longitudinal study with the aim of building a picture of student perspectives over three years. Longitudinal research is a research design where (a) data are collected for each item or variable for two or more distinct time periods; (b) the subjects or cases analyzed are the same or at least comparable from one period to the next; and (c) the analysis involves some comparison of data between or among periods (Menard, 2002, p. 2). A longitudinal approach is useful for investigating the dynamics of change, growth and development over time (Cohen, Manion & Morrison, 2000) and to identify general trends. It is therefore valuable for investigating innovations such as eportfolios and their impacts on student learning. Longitudinal studies may include different participants over time. Here, for pragmatic reasons, we chose not to follow a single cohort of students, but used instead a rolling sample (Gorard, 2001). After the first semester, all classes using the eportfolio were invited to participate, and consequently, each semester, in addition to first time users, the sample included a proportion of students who had previously used the eportfolio and were likely to have completed a questionnaire.

We have adapted the questionnaire used in the Australian ePortfolio Project (Hallam, Harper, McGowan, Hauville, McAlister & Creagh, 2008). This had the advantage of being used in a relatively similar educational context, and had been rigorously developed and tested prior to its use. The resultant anonymous questionnaire comprised six closed questions, one open question and seven closed questions with space for students to comment. The questions covered a range of pedagogical and psychological issues such as benefits for learning development of professional skills, getting employment, challenges and outlooks. The project received ethical review and approval and recruitment and data collection was carried out by the researcher who did not teach the students and the research assistant. SPSS software was used to collate the questionnaire data and present it by semester and responses to open ended questions were coded using NVivo. The research team then carried out a descriptive analysis of trends.

Participants

Two hundred and sixty-eight questionnaires were completed over 4 semesters and by 86% of students enrolled in those classes. Details of the student participants are provided in Table 1 below. This shows the programme year of student study, and the number of students participating over the enrolled number. The arrow indicates the movement of that group of students in the following semesters. Across the four semesters, 145 students were initial users and 47 students had three semesters' experience. Across the four semesters, students were aged predominantly 25 years and under (58 – 79% across the four semesters) and were mostly female (81- 97% across the semesters). The percentage of students with a Web presence such as Facebook was high, with a range of 91 – 97% across the semesters.

Table 1: B. Ed (Primary) Questionnaire Participant Information

June 2009 <i>(Semester 1)</i>	November 2009 <i>(Semester 2)</i>	June 2010 <i>(Semester 3)</i>	November 2010 <i>(Semester 4)</i>
Year 2(A)* 35/35 →	Year 2(B)** 26/30 →	Year 3(A) 25/28	
	Year 1(B) 38/40 →	Year 2(A) 38/40 →	Year 2(B) 22/30
		Year 1(B) 12/15 →	Year 2(A) 12/15
			Year 1(B) 50/70
			Year 3(A) 10/10
35 students	64 students	75 students	94 students

* (A) = first semester of the programme year

** (B) = second semester of the programme year

Results

We present selected results from four semesters of data. Because of the introduction to Year 1 students after the first semester, the results for semesters 2, 3 and 4 include first time users and it is only in semesters 3 and 4 that

student perceptions are available from students who have used the eportfolio for three semesters. However, there was a high level of survey participation in each class (from 71 – 100%) so the data has captured a large proportion of the available student perceptions, rather than those of enthusiasts. These results have been considered in the light of key contextual factors associated with the eportfolio introduction. In semester 1, there were issues with the performance of the software and many of these continued into semester 2. As the semesters proceeded, software issues disappeared, and the stable and committed teaching team deepened their understanding of eportfolios and the importance of scaffolding activities to improve student understanding. Findings from the associated qualitative project provided more in depth student perspectives which were also fed into the eportfolio development and facilitated a responsive learning design process. Learning support options were widened to address variation in student competence and confidence in using eportfolios and the introduction and rationale for using eportfolios was continuously refined in response to student perceptions and teacher insights.

Role/Use of the eportfolio for learning

Students were provided with a list of possible outcomes of eportfolio use and then asked to indicate the extent to which the eportfolio had helped them in their current papers. Students' responses were measured using a 5-point Likert scale.

Providing a Place to Store Examples of Coursework

Figure 1 below shows the proportions of students and their levels of agreement and disagreement with the statement about storage. The graph shows an upward trend of students who agree and strongly agree. In semester 1, this combined proportion stood at 66% and by semester 4 had risen to 86% of the students. At the same time, the proportion of students who disagreed or strongly disagreed declined and by semester 4, no students expressed this view, although 13.3% of students were neutral on this issue. This trend direction is notable because just over half of the semester 4 students were using the eportfolio for the first time.

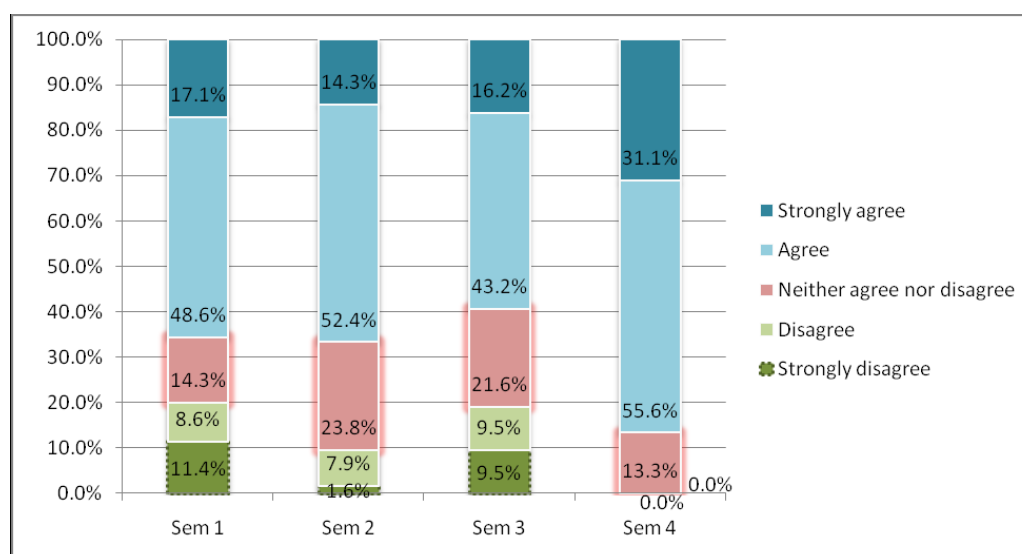


Figure 1: Providing a Storage Place

Allowing evaluation and reflection on the learning process

Figure 2 below shows the proportions of students and their agreement or disagreement with the statement. Across the four semesters the graph shows an upward trend of agreement. In semester 1, only 17.1% of students agreed with the statement and no students expressed strong agreement. By semester 4, 17.8% of students strongly agreed with the statement and when combined with students who agreed (66.7%) a total of 84.5% regarded this role positively and there was no disagreement or strong disagreement. This is a positive trend, especially, when taking into account the large number of first time users in semester 4. The high proportion of neutral students in semester 1 may be attributed to the technology issues. In subsequent semesters, neutrality

levels may be affected by Year 1 students' views of their Practicum reflections. This was their main use of the eportfolio and it was not assessed so it is possible that students may not have associated the reflections with their learning.

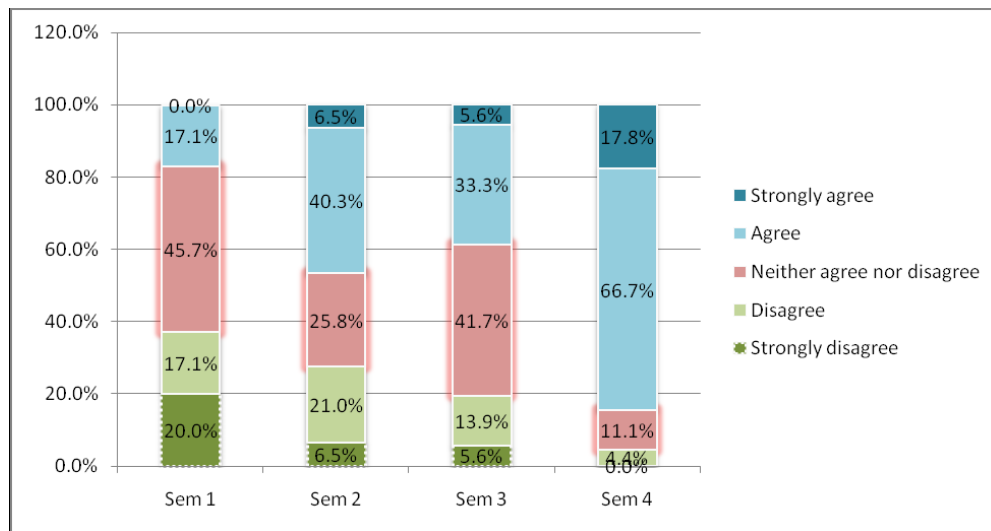


Figure 2 : Allowing evaluation and reflection on the learning process

Keeping track of learning experiences and reflecting on weak areas

Figure 3 below shows proportions of agreement and disagreement for this statement which focuses on the students' own progression rather than the learning process (above). There is a trend of increasing recognition by students of the value of the eportfolio for learning. In semester 1, 17% of the students agreed with the statement and by semester 4, 70.5% of students agreed and strongly agreed. The number of students who neither agreed nor disagreed remained somewhat static (31.9% - 34.3%) for the first three semesters and then decreased slightly to 23.9%. This may reflect the nature of assessment work and its direct links to the eportfolio from Year 2 onwards.

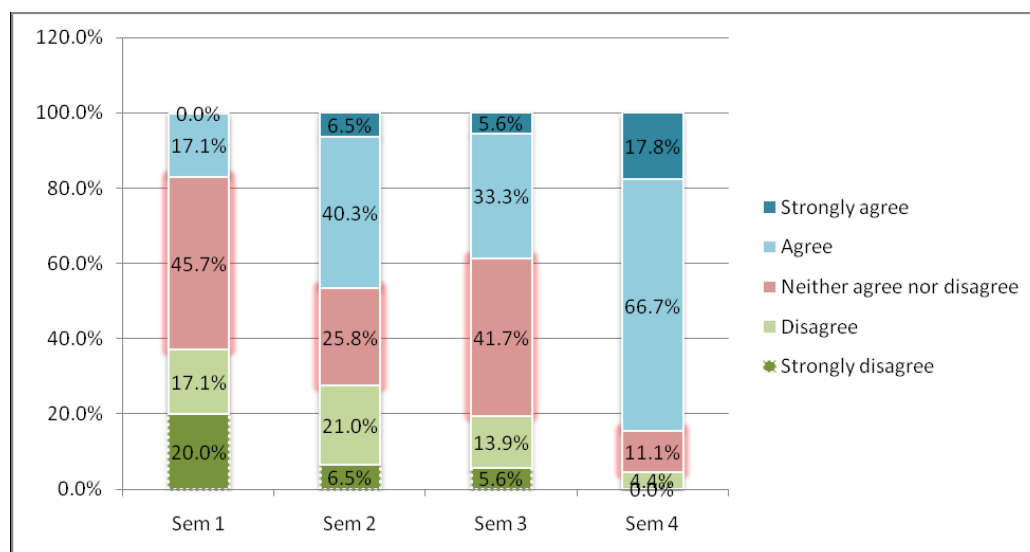


Figure 3: Keeping track of learning experiences and reflecting on weak areas

Helping students to become more effective and independent learners

Figure 4 below provides students' perceptions of their development as autonomous learners and here, data across the four semesters indicates a smaller increase in agreement. The proportion of students who agree and strongly agree rose from a modest 17.1% in semester 1 to 44% in semester 4. While the proportion of students who disagree/strongly disagree with the statement has reduced from 50% in semester 1 to 5.6% in semester 4, the proportion of students who are neutral has increased from 32.4% in semester 1 to 43.3% in semester 4. Possible influences on student perceptions here are likely to be related to the strongly scaffolded assessment tasks which students might not perceive to be building their capacity for independent learning.

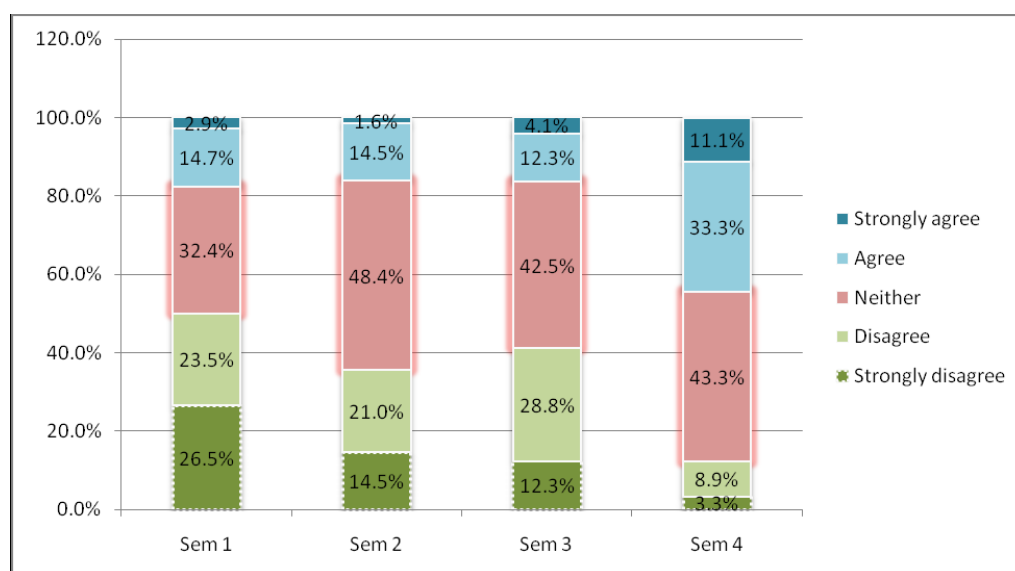


Figure 4: Helping students to become more effective and independent learners

Psychological Perceptions of Using the Eportfolio

Students were asked to indicate how they felt about using the eportfolio so far and in answering this question, they were allowed to choose more than one of the responses. Student perceptions are presented in Figure 5 below. This question may not be well constructed in that while the negative emotions are well represented in the literature, there are only two positive emotion choices for students and four negative ones. However, the data shows a trend of increasing enthusiasm and positive perceptions (from 3% and 17% respectively in semester 1 to 17% and 49% in semester 4) and decreases in negative emotions such as uncertainty (from 20% in semester 1 to 12% in semester 4), confusion (from 20% in semester 1 to 7% in semester 4) and anxiety (from 14% in semester 1 to 12% in semester 4). The proportion of students who remain neutral has stayed at a similar level at 26% although increasing in semester two and three to 34% and 36% respectively. While it is pleasing to see a reduction in negative feelings about the eportfolio, at semester four, still a quarter of students are neutral about it. This may be so because in semester four, half of the students were first time users and had limited use of the eportfolio in their course.

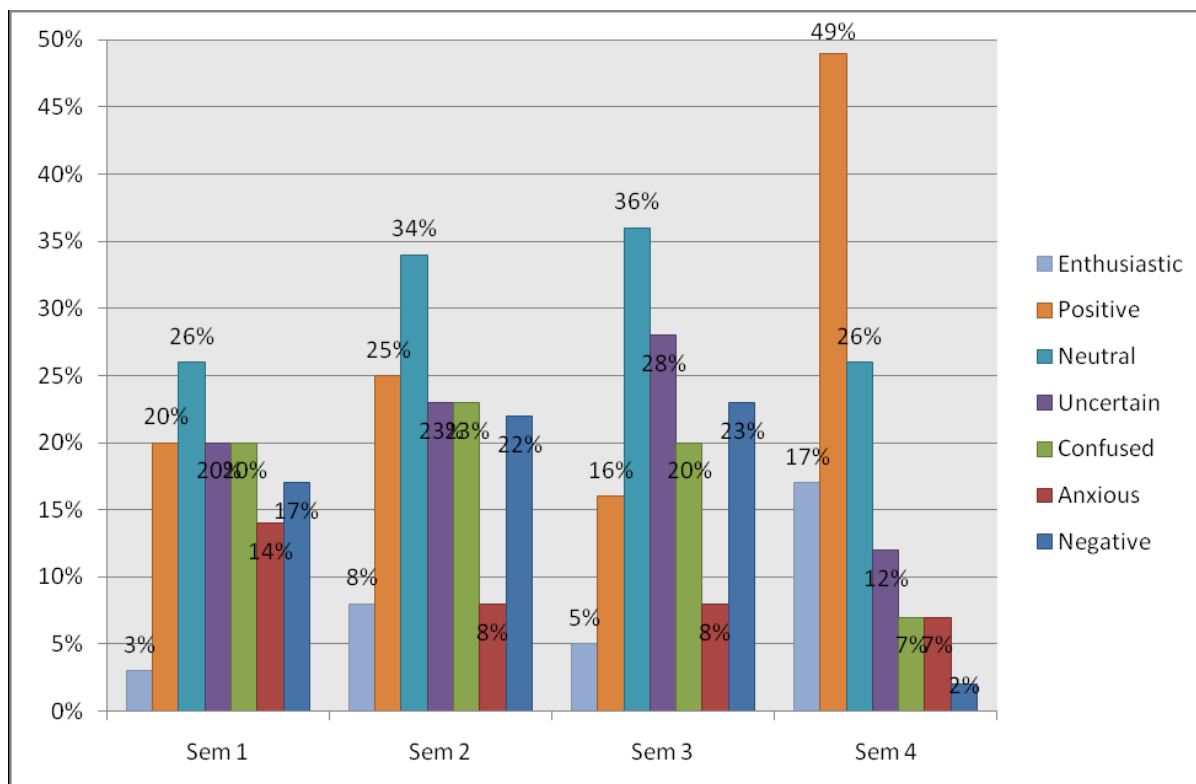


Figure 5: Psychological Perceptions of Using the Eportfolio

Challenges

Students were asked to identify in open text format the biggest challenge in using their eportfolio. Across the four semesters, 247 students (average of 92%) made 268 responses. Almost all of the comments were about developing their competence with the technology, for example, getting to know how to work with the Mahara ePortfolio - to navigate, to create and edit views and to allow specific views for lecturers and /peers:

It was hard to work out how to put things in and giving people views of your profile, and if you get a message, there needs to be a notice on the profile page (Semester 2 student)

There were also emotional dimensions in that students described the familiarizing process as difficult, complicated, confusing, time consuming, not user friendly and involving many steps. The trend over four semesters showed that issues reduced in frequency. A student in semester 4 commented that:

[The biggest challenge was] the initial set-up, until becoming familiar with the process; just getting used to getting to know how to use it, but once I played around with it, I found it very useful.

Discussion

The results indicate positive trends in the student body as a whole as the eportfolio technology and its accompanying pedagogy was developed within the programme. Results for the first three semesters are likely to be influenced by software issues and the residual impact on students. However by

semester 4, these were addressed and the results are noteworthy because they indicate that as students have more exposure to eportfolios, in a context where teachers are increasingly knowledgeable about their learning benefits and responsive to student issues, that students do begin to appreciate the ways in which they might help them to learn. Alternatively the results indicate that students are adaptable and can get on with their learning in a changed technological and pedagogical environment. The overall results also have value because they represent the views of students across Years 1, 2 and 3 of a programme from 10 classes and include most of the students in each class.

The high levels of recognition of the value of the eportfolio for storage and organisation is well represented in the literature. Lopez-Fernandez and Rodriguez-Illera (2009) found that students considered that the main advantage was the pragmatic one of “a private VLE” (p.614). This illustrates the very basic role of the eportfolio as a digital repository (JISC, 2008). The literature indicates that there is a challenge in moving students beyond the digital dimensions of the technology and on to recognising its potential for supporting learning and learning processes. Our results provide some evidence of growing recognition of this over time by these students in the areas of evaluating and reflecting on the learning processes and keeping track of their progress and considering areas of weakness. This research confirms the findings of Bolliger and Shepherd (2010) and Lin (2008) who all identified similar benefits around these learning processes, although at slightly higher proportions for reflection (80% and 87% respectively). The results validate a major benefit of eportfolios in their support of reflection which is recognised as fundamental to the construction of knowledge and differentiates the role of the eportfolio as a mere repository of knowledge (Riedinger, 2006)

The role of the eportfolio in helping students to become more effective and independent learners was less established over four semesters. Chau and Cheng (2010) found that independent learning can be supported by eportfolios but they also identified obstacles to its development. In addition to the students’ focus on the eportfolio as a product rather than a process, they also discussed the role and identity of teachers and the need to reconstruct the teaching relationship to be more student-centered. Lastly they noted the tension between universities’ current focus on the eportfolio as a showcase for its graduates’ attributes versus its use as a personal learning space for students. From our (New Zealand) perspective, there are broader issues associated with equity goals for universities. The elasticity of eportfolios means that it can support and encourage learning and self expression in a variety of media and across diverse experiences and therefore support a wider range of students. The tension between institutional and personal goals for eportfolios is complex and unexplored and mirrors broader national issues such as student mobility and the need for systems which can support transition and credit moving (Hallam et al, 2010) however in a manner which protects citizen’s privacy.

Despite the challenges of learning to use the technology effectively, levels of enthusiasm and positive feelings increased steadily across the four semesters and feelings of uncertainty, confusion, anxiety and negativity decreased commensurately. The extent of change is not as great as that measured by Lopez-Fernandez and Rodriguez-Illera (2009) who reported that students were initially equally either calm and confident or confused and bored, but by the second month of use, 79% of students were positive. These results contrast with Tosh et al’s (2005) study where many students had negative

feelings about the eportfolio which were expressed through lack of buy-in and lack of motivation. These appeared to be associated with the time involved to learn to use the technology and the limited functionality of the platform which was frustrating for students. Our research tracks a developmental pathway which sits between these two studies.

More direct comparison might be made with the results of the survey of 101 Australian university students as part of the Australian ePortfolio Project (Hallam et al, 2008) because our questionnaire was adapted from this Australian one. However student participants were drawn from four different tertiary institutions and across many disciplines, so the context was quite different. Briefly, technical issues were not significant and students identified the greatest challenge as selecting experiences and the reflection process. In the area of learning, Australian students reported slightly higher levels of agreement regarding supporting evaluation and reflection on the learning process (84%) and similar levels of agreement concerning keeping track of progress and reflecting on weak areas (71%) and helping students to become a more effective and autonomous learner (less than half).

One of the themes in the research on student perceptions of eportfolios is that it takes some time for students to recognise the value of eportfolios to support their learning and development. Instead, students are either engrossed in learning to use the technology (Tosh et al, 2005) or more interested in the pragmatic aspects of the eportfolio such as its ability to act as a repository and organiser (Lopez-Fernandez & Rodriguez-Illera, 2009) or to work as a showcase of their abilities for employment. This research provides some evidence of a trend of increasing recognition of the role of eportfolios in supporting reflection, and evaluation of learning, and, to a lesser extent, independent learning. The main challenge remains that of moving attention away from the technology and we are cognisant of student opinions that the eportfolio is not as easy to use as Facebook. We would like to see the eportfolio become part of the university learning landscape, and viewed in much the same way as its LMS. Our students have indicated that they would like to be able to access the eportfolio software after graduation for employment purposes and increasing availability might raise student perceptions of the learning and developmental value of the eportfolio.

Ramsden (2003) emphasizes the importance of contextual factors in influencing student perceptions of the learning context. The literature on eportfolios (e.g. Stefani, Mason & Pegler, 2007; Wetzel & Strudler, 2005) provides a significant body of pedagogical advice, however, there may be other factors which are influencing student perceptions. In the context of blended learning, Orton-Johnson (2009) found that students who did not engage with online materials acted in this way because they had concerns about the academic authenticity and trustworthiness of online materials. They wanted to remain with reading lists and books because they were reliable, safe and academically familiar. The challenge for students was to "reconfigure existing understandings and expectations of academic scholarship and reconstruct academic boundaries in new spaces" (p.837). Eportfolios, with their emphasis on digital media, representation, reflection, evidencing and synthesis also introduce new forms of academic scholarship which require students to construct new learning practices and change is not always easy, as this research indicates, and there are issues of sustainability.

Our results from this study provide some evidence of positive changes over time in students' perceptions of eportfolios. The results need to be considered in the light of particular contextual factors – the participants were student teachers who were already familiar with some dimensions of the eportfolio, particularly reflection. Students also came from classes of fewer than 50 students and this small class size is likely to have created a more responsive and interactive learning environment with ongoing professional feedback from teachers. The results also reflect the wording of the questions, which may not always have been clear to our participants. While this survey has provided an overview of student perceptions, there is little description or rationale for our student's perceptions and a qualitative study is being carried out to provide this complementary perspective.

Conclusion

The preliminary results from this three year project have demonstrated some trends of positive student engagement with eportfolios and the introduction of new learning spaces where students can focus on their development as reflective professionals. There may be a tension between this learner-centered focus and the broader use of eportfolios to evidence university accountability and graduate employability. In this case, strategies for reconciliation of the product and process aspects of eportfolios are highly desirable.

When students are learning to use a new technology and there are pedagogical changes associated with this, then challenges of the kind identified here may be unavoidable. Wetzel and Strudler (2005, p.26) argue that costs for students, such as time to learn to use eportfolios, can be substantial and this must be acknowledged by researchers and teachers who also must build understanding of what makes eportfolios meaningful and worthwhile for students. More longitudinal studies are needed to provide further insights into student perceptions of learning with eportfolios.

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