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Introducing the Mahara e-portfolio to student teachers: Teacher perspectives

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E-portfolios, a recent Information Communications Technology (ICT) innovation, have the potential to support learning by documenting development over time, offering exemplars for potential employers and providing evidence for registration purposes. This paper describes an introduction and study of an e-portfolio in the third and final year of a Bachelor of Education programme as part of a New Zealand wide funded tertiary project. The paper provides teacher perspectives after the first semester of implementation, and discusses the issues that arose when this new technology was introduced. Recommendations are also provided, including endorsing the role of collaboration by teachers to support innovation and professional learning, incremental approaches to embedding this technology into the curriculum, and preparing and supporting students in the use of e-portfolios.

Introduction

New technologies are a constant feature of the environment in which teacher educators work today. The introduction of such technologies raises issues about their value or otherwise in terms of their role in developing beginning teachers. This means that, as professional educators, we must learn to work with new technologies and evaluate their potential pedagogical value. One new technology that is receiving increasing attention by educators is the e-portfolio. This paper reports on the first semester introduction of an e-portfolio and reflects on its implementation through a study of teacher perspectives.

The authors, as part of an e-portfolio team comprised entirely of teacher educators at AUT University, participated in a national project relating to the introduction of e-portfolios in New Zealand tertiary institutions. The Mahara e-portfolio System Implementation Case Study was funded by the e-learning Collaborative Learning Fund (eCDF). It involved seven tertiary institutions in New Zealand and aimed to explore the use of the e-portfolio within the New Zealand tertiary sector with a view to forming effective guidelines for future use (Eduforge, 2006).

Literature Review

The literature on e-portfolios is relatively new and has mostly focused on the different types of e-portfolios, their special features and issues arising from



such characteristics, their roles in learning and development and issues relating to their use, especially their introduction to learners and teachers.

In teacher education, while paper-based portfolios are not new, the use of e-portfolios is a recent innovation. E-portfolios are a collection of evidence chosen and collected by the user to form a digital resource. They can also be a valuable learning and assessment tool and can demonstrate development over periods of time (Lorenzo & Ittelson, 2005; Wetzel & Strudler, 2005), both during pre-service education and after graduation. E-portfolios are viewed as a shift in the way teaching and learning is valued by many institutions, as e-portfolios demonstrate a wider view of learning (Harley & Smallwood, 2006), where learning is considered as life-long, and outcomes are not confined to academic results alone (Siemans, 2004).

The literature discusses three kinds of e-portfolio: developmental (to document the growth of personal and professional skills); reflective (to enable students to revisit practice and reflect on it as a basis for future learning) (Barrett, 2004); and representational (to showcase personal and professional highlights) (Zeichner & Wray, 2001).

In general, e-portfolios can be used to manage and store personal and professional artefacts that track a history of personal and professional growth and development (Butler, 2006). In addition, they can be used as a tool to set goals and to form a basis for reflective practice or self-study. This enables students to make meaningful links around theory and practice. By forming a digital resource that provides student teachers with opportunities to revisit their practice (Abrami & Barrett, 2005; Klenowski, Askew & Carnell, 2006; Loughran & Corrigan, 1995; Smith & Tillema, 2003) an e-portfolio supports development of critical thinking in a professional context and provokes students to commit to life-long learning (Siemans, 2004). E-portfolios also allow students to enhance their ICT skills in a meaningful way. For both teacher educators and learners, e-portfolios form a space for sharing their learning.

As the use of e-portfolios becomes more widespread, Lorenzo and Ittelson (2005) have identified wider issues to be considered. A significant issue is that of ownership of the e-portfolio; that is whether it should be regarded as belonging to the institution (which provides the software), or to the students (who create its content) or to both parties. Another issue is whether the institution promotes the e-portfolio as a tool to assist students to find jobs, and to reflect on practice. In addition Lorenzo and Ittelson note questions and concern around discovering the best way to encourage critical reflection in the design and use of portfolios; should they be optional or mandatory, and what instructional sessions should there be to support their use? Associated with this are issues of privacy and copyright in displaying student's work, as well as the difficulty of storing too much information in a disorganised way.

Although e-portfolios can be used for a variety of purposes, it is important that when they are used as part of a course, their use is implemented in a meaningful way (Hall, Kiggins & Weimar, 2005) and is embedded within the teaching and learning process through authentic assessment. They may be used in a positivist paradigm that reflects standards created externally to the student, or in a constructivist paradigm based on standards that the student themselves have created (Barrett, 2004). E-portfolios are likely to be attractive to Net Gen students – that is learners who were born from the 1980's or afterwards, and who have grown up with technology and the Internet (Oblinger & Oblinger, 2005). These learners are often regarded as



technically proficient, capable of operating as multi-processors, thinkers in a hyper-linked rather than linear fashion and are comfortable with various media (Brown, 2002). However, it is also important, that the technical aspects of an e-portfolio are user-friendly and well managed, so that it is a positive experience for all students, including those, for example, mature students, who are less technically competent and confident.

When an organisation introduces e-portfolios, implementation issues arise. Based on their research with experienced users of e-portfolios in teacher education, Wetzel and Strudler (2005) provided recommendations for implementation issues which may arise. They identified the importance of high level leadership and strong participation by teachers and technology people, having a clear rationale for the introduction of e-portfolios, sufficient access, training and support and moving in planned small steps through the use of a pilot study. In the course of this project, the AUT e-portfolio team has taken heed of these recommendations and implemented some initial steps to resolve the above issues.

The Context

In 2006, the Tertiary Education Commission funded the development of an e-portfolio, named Mahara, for the New Zealand tertiary sector (Eduforge, 2006). This software enables learners to build an electronic collection of their learning and development, through text, media files and blogs and to assemble 'views' to show their work to selected audiences who can give them feedback. Thus, student teachers are able to collect evidence of their learning and practice (for example, photos, videos, scanned images and text files from practicum and their coursework) and then show this to their peers, prospective employers, and their teachers, and receive comment. The e-portfolio belongs to the student teacher and can be taken with them after graduation as evidence of their professional learning for teacher registration and then as a support for lifelong learning as a professional teacher. There are many advantages over a paper portfolio: e-portfolios are highly portable; they can present media files (e.g. videos); they have the flexibility to create different views for different parties, which can also be made available for people in different places. Additionally, e-portfolios support interaction and social networking.

After the development of the Mahara e-portfolio, in 2007, seven tertiary education organisations took part in the e-learning Collaborative Learning Fund (eCDF) funded Mahara e-portfolio System Implementation Case Study. Each institution implemented the Mahara e-portfolio within an undergraduate programme and completed a 'case study evaluation' of their implementation. This was a limited scope evaluation based only on teacher perspectives of the e-portfolio and its implementation within a programme of study.

The School of Education at AUT University was funded to implement this e-portfolio within its Bachelor of Education for early childhood and primary teacher education students. An e-portfolio team, comprising six teachers from curriculum, professional practice and educational studies papers, was formed to implement the e-portfolio and carry out the case study. The e-portfolio was introduced to 80 third (final) year early childhood and primary students and gave them an opportunity to trial e-portfolios within a structured, technologically supportive environment provided by their teachers. For this pilot, we (the e-portfolio team) wanted our students to be able to utilise all aspects of the e-portfolio system: blogs, collections of artefacts (eg. paper files, video, pictures, diagrams, etc.) and the social



networking space with their fellow students and teachers to support their reflection and learning.

We did not regard Lorenzo and Littleton's (2005) duo of approaches as mutually exclusive and also hoped that students would gain confidence with e-portfolios and use them in the future for employment, the collection of evidence for full registration with the New Zealand Teachers Council and other professional learning. A value-added benefit of this pilot was to provide students with the opportunity to further develop their ICT skills and understanding which was necessary as some students were very much digital immigrants (Prensky, 2001) whereas others were digital natives of the kind described earlier by Brown (2002).

A variety of training strategies were used for the e-portfolio team and students including scheduled sessions by a university Flexible Learning Advisor, independent guides (instructional manuals), and individual assistance. The e-portfolio pedagogy that was developed was a combination of the three types discussed above in the literature and emphasised a constructivist paradigm of knowledge. To ensure that the e-portfolio was properly integrated within the aims of the individual papers and to ensure coherency across the papers, ideas were developed and discussed at regular team meetings of the six teachers in the e-portfolio team. An important integration activity was the collaborative development of a matrix of all of the papers which linked the e-portfolio use to the learning outcomes and assessment for the six papers. The matrix is presented in Appendix A and shows a range of activities such as lesson plan development and reflection, submissions that build to a summative assessment, and philosophy statements. By making some of these tasks a requirement, we ensured that students engaged with the idea of the e-portfolio because they had to become comfortable with the software and then connect that to their learning. We were also interested to see whether students would use the system voluntarily, so formative tasks were also included in all papers.

Students were provided with on-going support throughout their classes. As their teachers, the e-portfolio team regularly discussed the e-portfolio in class and linked it to the paper outcomes and assessment. Students were given opportunities through the blog to receive feedback from other students and teachers. Technology support was provided by a Flexible Learning Advisor and Mahara project staff.

Purpose of the Study

The national project aimed to investigate the implementation of the Mahara e-portfolio in tertiary settings, with a view to later developing guidelines for the use of e-portfolios in educational settings. The research questions for the case studies were concerned with the benefits or value of the e-portfolio for teaching, and its disadvantages or limitations, the benefits, values and limitations in relation to the students' learning experiences and the factors affecting use by teachers and learners during the implementation. The study lasted for six months and focused on teacher perspectives of the introduction of the e-portfolio and all other activities associated with the introduction of such an innovation.



Method

There was some flexibility in the methodology, so we decided to carry out the research as a collaborative self study where we, as the e-portfolio team (of six third year teachers) focused on researching our e-portfolio practice. Loughran and Northfield refer to self study as a 'participant study of experience' (1998) and Barnes (1998) discusses such study as investigation into one's own teaching which operates as a form of professional learning creating new knowledge for both the teaching team and wider audiences through publication of outcomes.

The literature indicates that collaboration is an important aspect of self study; Louie, Stackman, Drevdahl and Purdy (2002) identify the benefits of the social support that arise from a common research endeavour and the multiple perspectives presented through which participants can consider their own beliefs and practices. Barnes (1998) also notes the value of colleagues in questioning and validating, and observes that openness is also important to ensure all views and experiences are valid, and outcomes are not determined by status or position. Collaborative self study may include action research but not necessarily and it is different from reflection on practice. Loughran and Northfield (1998) regard the latter as an individual process of thinking about practice and a professional learning activity whereas self study extends this to communication of new knowledge and understanding (1998, p.15).

Self study has been challenged as a valid form of research; however, its use is widespread within teaching for supporting and enhancing teacher development and improving learning (Barnes, 1998). We were attracted to this approach as a scholarly form of teacher inquiry into the technology and pedagogy of e-portfolios and also as an opportunity to model this approach to our third year student teachers. Such an approach also reflected the school's practice in curriculum development and review, as well as the school's commitment to collaboration as a valuable and valid form of knowledge construction.

Ethics approval for the project was obtained. Data was gathered from course documents, minutes of meetings, and group and individual reflections. These reflections were gathered via a blog and in face-to-face team meetings where implementation issues were identified, strategies planned, put into action and then evaluated. The blog was one of the tools within the e-portfolio and as such, provided a natural vehicle for reflection. The Mahara blog also supported the collaborative nature of the project by enabling the project team to look at each other's reflections and provide feedback. Using the e-portfolio application itself as a research instrument more fully situated the research and the researchers within the actual e-portfolio context. It also supported a more effective form of data collection and access for the researchers. We intended to obtain aggregated usage statistics, but unfortunately, these were not able to be produced.

Findings

The data was analysed to identify themes, and patterns concerning the implementation. The research questions themselves fell easily into three categories (teaching, the student learning experience and factors affecting implementation) and provided a natural vehicle for analysis. This was further supported by our blogs which had been established to enable the e-portfolio team to reflect directly on the research questions themselves. The e-portfolio



team minutes from face-to-face meetings were also analysed thematically under the three case study foci. Each of these areas is discussed next.

Implementation and Development Issues

At the beginning, the main issue related to the need of the project team to simultaneously develop an understanding of the technology and the most powerful ways of including it within curriculum designs for the third year papers. The team decided to use the e-portfolio within individual papers in the way that best suited their learning outcomes. At the same time, communication to the rest of the School of Education and students about the aims and benefits of the project was a priority. This required the team to be clear about the rationale for the project and how it was going to benefit learning; this was essential for the introduction of a new technology like e-portfolios.

Organising student training for using the e-portfolio was also important. This required selecting the relevant portions of the User Guides which had been developed by the software designers and translating them into easily understood formats. Ten training sessions were offered to approximately 86 students. Multiple training strategies were necessary because there were many different levels of ability and confidence due to the diverse backgrounds of the students. Some students lacked confidence about using computers and others were quite expert and could easily upload images and deal with different kinds of media files. Strategies therefore ranged from multiple sessions in a computer laboratory, individual coaching, answering email inquiries, setting up an online discussion board, providing handouts for students through the online learning system and calling in expertise on media files.

Ensuring that the project and the teaching team received organisational support, for example, connection to the university's enrolment systems, and staff development were identified as essential. Also important was the location of the e-portfolio within the university's online learning platform and its support systems. This enabled easy access for students and teachers and provided valuable additional support via the Helpdesk.

Teaching with the e-portfolio

Teachers identified the main characteristics of the e-portfolio that were beneficial to teaching and learning. The text-based nature of the blog had the potential to support professional reflection and deepen thinking. The blog also operated as a social networking space, where students could upload their files and share them with the teachers and their peers, thus indicating its potential value for constructivist learning:

The e-portfolio provide[s] a space for students to think about some aspects of the course or their understanding of it and then write about it in a social milieu.

[Teacher3]

The social aspect enables students to receive affirmations and new ideas but also challenges and thus provides new methods of knowledge construction for individuals.

[Teacher 2]



The e-portfolio also supported the development of professional practice in a very modern sense:

I think the greatest benefit for early childhood teachers and students is that they can conduct a professional dialogue online, and this has the possibility to connect with others online.....I also think that for teachers registration they are able to store artefacts online in one site so that all their evidence of teaching is conveniently in one place.

[Teacher 5]

I think an e-portfolio system, especially one with a blog as Mahara has, provides an opportunity for students to interact with peers and tutors as they construct their understanding of their subject area and apply this to their lives... It also allows students to document their progress and to easily ensure that their 'web presence' is up to date.

[Teacher 1]

Other valuable facets were the opportunity to extend ICT skills, and the way in which the online contact could complement face-to-face class meetings. In addition one teacher noted:

The system enables teachers to see the students in a perhaps less formal and more relaxed context. It allows the teacher to 'know the students' more completely fulfilling the concept of relational teaching more holistically than three hours once a week can.

[Teacher 4]

The disadvantages that were identified often arose due to the developmental nature of the software, and the time it took for teachers to understand the software:

Time was an issue for many people. Not just time to learn the software, but also time to get to grips with the concept, which was new to many of us. We need to work at helping students to see the relevance and benefits that an e-portfolio can offer - and not just students - employers and government departments also need to take this on board. Or people just won't go there.

[Teacher 2]

The Student Learning Experience

The focus of the research project on teacher perspectives meant that data on student perspectives were not gathered, however, teachers were able to provide some views on students' perceptions of the e-portfolio. It appeared that students quickly understood the conceptual basis of the application, but it took a much longer time to use the application proficiently. The idea of an e-portfolio was initially received with interest from students, however as the semester progressed, concerns were expressed as students grappled with understanding and using the technology.



Some individual students expressed resentment at 'being required to do this extra work' but became much more enthusiastic after a conversation about the goals of, and benefits of participating in, the project.

[Teacher 1]

Teachers were concerned that students who did not have easy access to a computer at home might be disadvantaged. In some cases, the e-portfolio was regarded as another call on students' time and in the face of other pressures, teachers were uncertain about the amount of voluntary use that might occur:

Students will use the system if they are required to for assessment. After that, this will depend on student perceptions of its value. Here, I suspect this will be coloured by its relatively new status, ease of use and students' conceptions of technology.

[Teacher 2]

Teachers perceived that another source of student anxiety was the connection of the e-portfolio to assessment which was exacerbated by issues with the reliability and usability of the technology.

Despite the demands on everyone's time and issues with the development of the software, the e-portfolio project team considers that this e-portfolio has considerable learning potential. The next section of this paper discusses the implications of some of the findings, the challenges and future recommendations.

Discussion

In this section of the paper, we reflect on the implementation issues that arose for us, and then on our experiences as teachers using the e-portfolio to support learning. Lastly, we consider issues that arose from our perceptions of the student's learning experiences. In order to provide some guidance for other teacher educators who wish to introduce an e-portfolio, we have made a number of recommendations. We offer these, not as a prescription, but rather as a platform for reflection, and recognise that every educational or practice setting has its own contextual nuances which always need to be considered.

Implementation Issues

While the literature (Wetzel & Strudler, 2005) has identified the importance of top down and bottom up support, one of the key features of this development that assisted its implementation was the collaborative approach taken by the development team, and especially with the 'technology people'. We were able to form a learning community which operated across a variety of contexts where we could assist each other quite pragmatically with understanding the software. In a pedagogical sense, we were able to extend the group's knowledge of the technology and how it might be used within the programme. Our regular meetings provided both mutual support and provocation through dialogue and interaction.



There was room within the collaboration for us to discuss our personal perspectives of e-portfolios with our students, while at the same time, presenting a common vision of the role of e-portfolios and our rationale for their introduction. For these reasons, we would recommend that teacher educators consider taking a collaborative approach for the introduction of this technology. Not only did it provide a good environment for our co-construction of knowledge but also, we were able to overcome the problem that many innovations have when there is a 'lone ranger' operating independently. In our view, working as a collaborative team is an important strategy for sustainable development of technology innovations.

We were committed to our own professional learning and planned to establish our own e-portfolios so that we could learn experientially and also use them with our students as a model (Tosh, Light, Flemming & Haywood, 2005). However, due to the demands of introducing the e-portfolio, we were unable to establish these individually. We did however use the e-portfolio to support our collaborative research for this project through the blogs. This kind of usage provides a new social networking space for teacher educators which can be used to support both personal and community professional reflection and learning. We therefore recommend that teachers consider using e-portfolios for their own as well as their students' learning and development. This provides an opportunity for teachers to learn experientially and to model this practice for their student teachers. The challenge lies in 'creating a space' for the e-portfolio and spending time in reflection, reading and responding to colleagues' comments.

Teaching with the e-portfolio

The six teachers in the e-portfolio team, like the students, were a diverse group. Some had a deep understanding of the technology that accommodated multi-processing thinking approaches and others could see the potential of the e-portfolios, but were initially not confident in using it. A variety of approaches were therefore used by teachers in the e-portfolio team which reflected their different interests and confidence.

Teacher perspectives about the value of the e-portfolio for professional reflection and developing professional practice reflected a multiuse approach (Zeichner & Wray, 2001). It was important that the e-portfolio operated primarily as a developmental and reflective tool, and the reflective and social networking spaces demonstrated how this might occur, thus suggesting the potential for e-portfolios to support a constructivist learning philosophy (Barrett, 2004). The team recognised that students might wish to use the e-portfolio for employment purposes and for providing the evidence necessary for teacher registration. This study indicated that these two quite different uses represent a tension between teacher and student perspectives of the e-portfolio, however not one that is necessarily incompatible. We recommend that teacher educators consider the different ways in which formative and summative elements can be incorporated within an e-portfolio to accommodate these different interests and maintain relevance for student teachers.

Reflecting on the pedagogical challenges, and Wetzel and Strudler's (2005) advice regarding implementation, the e-portfolio team avoided the kinds of disjunction that often arose when innovations were significant and disruptive by planning small steps for integrating the programme into the papers. We recommend this kind of incremental approach which can be used to build the skills and confidence of both teachers and students. Within the early childhood programme, in the Professional Inquiry and Practice paper,



students had already participated in an on-line reflective journal and were familiar with down-loading online lecture notes and materials, and uploading assignments into Turnitin, a software package that identifies plagiarism. The e-portfolio activities for the paper were therefore evolutionary, rather than revolutionary and were adapted to build on previous experiences, while at the same time, further developing ICT skills.

Much of the literature discusses the value of an e-portfolio for integrating an individual student's knowledge; however, it became apparent to us that the need for co-ordination in assessment was considerable. Owing to the overall demands of introducing the e-portfolio, we did not adopt this approach. Instead, each member of the e-portfolio team used the e-portfolio in the way that best met the learning outcomes of their paper. We would recommend this approach because each teacher can implement the e-portfolio in a meaningful way for their specific students and the context of the paper while at the same time benefiting from collegial support. This approach also allowed the teaching team to judge and compare the usefulness of the e-portfolio across the three main types of usage as noted above in the literature review (developmental, reflective and representational) (Barrett, 2004; Zeichner & Wray, 2001). In order to prevent fragmentation, we used a curriculum matrix. We would recommend this for the additional overall cohesion and integration it brought to the third year e-portfolio programme. Constructing the matrix was also a valuable collaborative activity because it promoted professional dialogue and deeper understanding of the e-portfolio.

As an example of our approach, students in the early childhood programme submitted reflections on teaching practice, lesson plans and philosophy statements and were able to receive feedback from their chosen peers and teachers. This activity was strongly connected to the learning outcomes, and we identified the added advantage of a central storage site to document teaching development where teachers provided comment on these reflections, and avoided the difficulties associated with cumbersome paper based portfolios. However, as student work usually consisted of several digital photos, the additional technical challenge of compressing files had to be addressed which required further training for staff and students.

In the Primary programme, students had an assessment option based on using the e-portfolio for a science assignment in a Curriculum Studies paper. Approximately one-third of the students chose this option, and it appeared that they enjoyed the use of the e-portfolio as an alternative to the paper-based essay format. The e-portfolio provided the opportunity to view each other's work and so form a community of learners. The teachers expected that this participation in an e-community would enhance professional dialogue, critical thinking and a commitment to lifelong learning; however student feedback on this aspect of the e-portfolio was not pursued.

The Student Learning Experience

The main findings concerning the student experience were issues related to using the technology, impact on workload, ease of access and assessment anxiety.

Adding e-portfolios to courses means that students have to learn to use another piece of software, in addition to the university's learning management system, and various library and record keeping programmes; this places significant demands on students. More opportunities are needed for students to 'practice' with the e-portfolio. Wetzel and Strudler (2005) acknowledge this issue and discuss the need to move in planned small



steps with training and support. We recommend that students receive training and time to practice, or 'play' time which is not linked to assessment early in their university studies to build confidence and reduce anxiety. By allowing for more lead-in time, especially for students who are not ICT literate, students are more likely to become confident and able to cope with the demands of the e-portfolio. We recommend multiple training strategies to accommodate the needs of these students as well as the technologically literate students whose experience of Web 2 technologies, such as Facebook, makes e-portfolio understanding very rapid and almost intuitive.

Closely connected to this is the need for students to understand the rationale for e-portfolios. We recommend that teachers devote some time to explaining the role of this new technology and its value for professional learning and development, and the ways in which this will occur within the course. Much of the literature, for example, Stefani, Mason and Pegler (2007), emphasises the importance of learners understanding why e-portfolios have been introduced and how they might help them in their learning and future careers.

It will be a continuing challenge to address the needs of students who have limited access to computers. Wetzel and Strudler (2005) identified this as a key area for development. Limited access increases the digital divide and makes it difficult for students to have sufficient time to practice and use e-portfolios, especially the social space. We recommend that teachers and institutions carefully consider access provisions and ensure that there are adequate ICT facilities.

In some papers, e-portfolio assignments were optional, so students considered the tasks as an 'extra' beyond normal course requirements. This may be a workload issue or it may be connected to student perceptions that what is valuable in a programme is only what is assessed. However, e-portfolios are a relatively new phenomenon, and as discussed by Lorenzo and Ittleson (2005), students may not understand their status or ownership, which might then be reflected in their lack of use. We would recommend that e-portfolios are used both formatively and summatively so that students can start to understand the role of e-portfolios in their development as teachers. As well as assessment, what is particularly important is support for reflective practice (Abrami & Barrett, 2005; Klenowski, Askew & Carnell, 2006; Loughran & Corrigan, 1995; Smith & Tillema, 2003), support for critical thinking and life long learning (Siemans, 2004) and the storage of professional artefacts and tracking professional growth (Butler, 2006).

Some students were anxious because of the connection of assessment to a technology with which they did not consider themselves sufficiently familiar. In some courses, teachers responded to this by making the e-portfolio element optional. When e-portfolios become a more standard element of the ICT landscape, and with more structured lead-in times, students will regard the use of e-portfolios as a normal part of their initial teacher education as they now do with a learning management system. In order to better communicate this to students, all course requirements utilising an e-portfolio should show clear links to professional practice. This will assist students to regard the e-portfolio tasks as meaningful and authentic forms of assessment as suggested by Hall, Kiggins and Weimar (2005). This needs to be balanced with the goal of developing independent learners, which may be better achieved with more constructivist approaches to using e-portfolios.



Conclusion

If e-portfolios are to become more than electronic filing cabinets, then teacher educators need to better understand this technology and its capability and this collaborative self study has reported on how teachers might start to do this. By introducing this technological component early in a programme, and fully elaborating the goals and benefits of utilising it, e-portfolios can be naturalised within teacher education programmes, so that students will see their value in their studies and as beginning teachers. In a similar way, e-portfolios are also able to support our own learning as teachers, researchers and scholars, both individually, but more powerfully, as communities of learning and practice.

This paper has reported one perspective on the introduction of e-portfolios to third year early childhood and primary student teachers, being that of the e-portfolio team who were teachers of the students. In order to deepen our understanding of this new technology, other voices need to be heard, particularly those of our students, but also those of graduates, early childhood centres and schools.

Through this self study, we have come to acknowledge the potential of this technology, especially its social networking and blogging facilities. We would like to see wider adoption by teacher educators for their students and themselves. The first semester of implementation required attention to issues like infrastructure and training and development. As a result, we consider that we have therefore been unable to assess the full learning potential of this e-portfolio technology. We are now implementing a further cycle of development, with greater focus on its pedagogical possibilities for supporting learning – in order to position our graduates well for their professional work and lifelong learning.



Appendix A

COURSES:	E-portfolio contribution	Formative Items:	Summative Items:
Professional Inquiry and Practice III (Primary)	1. Theory to practice connection 2. Demonstrates professional/personal development 3. CV Development 4. Prototype for NZTC evidence-based registration requirements.	Goals including evaluation 3 x lesson plans/reflections 3 x weekly reflections	Philosophy statement Philosophy (personal BT)
Professional Practice and Inquiry III (ECE)	As above	2-3 exemplars of reflective models	
Introduction to Research	1. Demonstrate critical consumers of resource 2. Demonstrate understanding of role of research in teaching	Reflection on teachers as critical consumers of research	Reflection on role/value of research for their own teaching practice
Montessori Programme Planning	Assessment 1 Assessment 2 programme planning during practicum	Lesson plans Proposed lesson plans	Final Plan
Montessori Philosophy and Curriculum 297340/04	Assessment 1 a) Intro essay on founder and philosopher b) Teaching portfolio group project	Lesson plans	Philosophy (specialty)
Curriculum 5	Assignment 2 Philosophy of teaching approach	2-3 exemplars of reflective models	
Programme Planning Assessment and Evaluation	How does the availability of a social space contribute to and facilitate the development of student's collaborative/reflective approach to assessment construction?	Fortnightly submissions that 'build' into one of the summative assessments for the course	Establishing a Montessori 'unit' in a State school - Achievement-based summative project of five discreet but integrated tasks



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