

The Development and Evaluation of a Student Centred Reflective and Professional Electronic Portfolio for Pre-service Teachers.

Dr Lina Pelliccione

Faculty of Education, Language Studies and Social Work
Curtin University of Technology, Australia
l.pelliccione@curtin.edu.au

Dr Kathryn Dixon

Faculty of Education, Language Studies and Social Work
Curtin University of Technology, Australia
k.dixon@curtin.edu.au

Mr Robert Dixon

Faculty of Education, Language Studies and Social Work
Curtin University of Technology, Australia
r.dixon@curtin.edu.au

Abstract

Technology must be used to reflect the most current thinking about education and its use should be as a common language for linking people and projects into the future. The development and implementation of electronic portfolios in the tertiary sector has the potential to meet such a challenge. This paper reports on the initial findings of a study which aimed to empower students to map and demonstrate their developing professional skills, knowledge and values through the use of electronic portfolios. The sample involved 30 first year students in a Bachelor of Education course in Western Australia. The findings revealed that the majority of students believed that it was possible to construct a personal portfolio electronically and that it should reflect personal works achieved over time. Students viewed the construction of the portfolio as a way of increasing their own skills in order to replicate a similar process in their own classroom environments.

Background

Pressure is increasing upon the education sector to respond to rapidly changing conditions brought about by improvements in technology and a shift in emphasis towards a more pluralistic and accountable approach to teaching and learning. According to Kimball (2002) the momentum behind the development, implementation and use of portfolios in educational settings is considerable and the tertiary sector is no exception. Portfolios are currently in use at all levels and in many fields with particular success in composition programs and teacher-training. The growing support for portfolios (either paper-based or electronic) is due to the fact that many levels of education see the benefits of their use as pedagogical, learning and professional tools. Kimball (2002, p.14) identified portfolios as offering direct benefits to students such as an opportunity to explore and solidify the connections between the disparate things they have learned. This approach to learning also gives the student the opportunity to create something tangible, something that seems real, useful and practical. It also creates the opportunity to reflect on the process of learning, therefore cementing cognitive skills that students will hopefully use for the rest of their lives. For educators portfolios offer a methodology that places equal importance upon the process and products of student learning and concrete materials for assessing and demonstrating student learning.

Winsor and Ellefson (1995, p.3) define the concept of a portfolio as,

A thoughtful, organised and continuous collection of a variety of authentic products that document a professional or student's progress, goals, efforts, attitudes, pedagogical practices, achievements, talents, interests and development over time.

Simmons (1996), and Wolf and Dietz (1998) suggest that the three main functions of portfolios are related to learning, assessment and employment/professional purposes. The first two are more student-oriented, whilst the third is meant to demonstrate professional development containing for example, a resume and artefacts of 'best practice'. The third type of portfolio would also include a personal learning philosophy, letters of recommendation, awards, official documents, curriculum innovations, reflections and personal evaluations.

Campbell (1997) divides the professional portfolio into two separate forms. The first is the working portfolio, which is described as a collection of artefacts used as evidence of professional competence. The second is a presentation portfolio that is described as a functional and aesthetically appealing display of an individual's work.

According to Salend (2001), however they are organised or prescribed, professional portfolios should be both process and product oriented with a focus on the collaborative and reflective process of the teaching and learning experience.

A sophisticated body of academic research has now refined the concept of the professional portfolio into a functional tool that provides genuine evidence of performance, competence and leadership. It should be suitable for the purposes of summative assessment purposes, as well as providing for continuous growth and reflection in the formative development of both students and professionals alike.

The communication and information technology aspect of the portfolio concept is clearly an emergent area for investigation and development. Universities in Australia, and indeed internationally are currently developing, trialling and implementing various approaches to electronic portfolios. The rationale is in order to enhance student reflection and learning, and to provide improved evidence of student achievement to external groups such as potential employers, accrediting bodies and governmental accountability mechanisms. Barrett (2000) links the traditional and process oriented portfolio by pointing out that both have evaluation criteria grounded in purpose.

The Purpose of Portfolios

Portfolios are best viewed as flexible tools which can be used in many fields and at many levels. Both reflection and collection ask the author to consider previous work subjectively and objectively. Reflection occurs when the student provides written statements where comments are made regarding not only the artefacts, but the process of their production. Without a clear purpose, there is the risk that the portfolio will degenerate into a scrapbook which is representative of randomly selected 'snapshots' of achievement. Kimball (2002) indicates that there are many purposes behind the creation of a portfolio. These include the need to fulfil the requirements of a program, a class or a profession, the need to demonstrate mastery of a skill and/or body of knowledge, the need to show the development of a project over a period of time and to demonstrate the fulfilment of specified learning outcomes and to show prospective employers particular abilities and accomplishments.

Kilbane and Milman (2003) conclude that the push for "authentic" assessment can be supported by the implementation of portfolios in education. The goal of authentic assessment is to measure individual performance or achievement in situations or tasks that most closely match the standards and challenges of real life. When portfolios are used as the basis for assessment, progress on real-world tasks can enable the tracking of growth over time and help individuals learn to assess their own progress against standards of quality. Educators are increasingly using portfolios as an alternative form of student assessment because multiple-choice tests and other more traditional forms of assessment are inadequate measures of what students know and can demonstrate.

The Case for Electronic Portfolios

The growth of the portfolio as a method of teaching and learning has been influenced by the development of the World Wide Web. The Web's graphical nature and ability to support links between digital artefacts has revolutionised how information is located and consumed. Purves (1995) states, that the use of the Web as a portfolio medium builds on some of the key strengths of portfolio pedagogies. Where traditional, paper-based portfolios have concentrated on presenting written work, Web technologies allow authors to include graphics, audio and video. This visual capacity provides more options for showing what the authors have accomplished. More importantly, the linking mechanism of the Web matches the goal of tightly integrating the elements of a portfolio and adds opportunities to connect the portfolio to the rest of the world. This feature can clearly be utilised as a marketing tool for educational organisations that wish to remain competitive in terms of enhancing the post-association employment opportunities of students.

Kimball (2002) suggests that the Web offers additional benefits for students and teachers, such as the ability of these portfolios to showcase student work to a definite audience. Projects that may have appeared to be academic exercises become more real when students know that large numbers of people can see what they have created. It would seem that Web-based portfolios have a natural position within the increasing use of these technologies in course construction and general programming in education. The expansion of online learning, particularly in the tertiary sector, creates a natural affinity between learning and assessment using this mode.

Storage of files is easier due to reduced size, and basic Web portfolios that do not contain audio or video can usually be stored on a single floppy disk. Kimball (2002) reports that the growth in electronic Web-based portfolios is most clearly seen in the United States where large-scale initiatives have begun on a variety of levels (classroom, program and campus-wide) to encourage or require undergraduate, pre-professional, graduating and graduate students to create electronic portfolios. Currently, forty-one colleges and universities have started institutionally-supported portfolio programs.

Electronic portfolios (E-folios) although still relatively early in their history, appear to have some distinct advantages over their paper counterparts. These include:

- e-folios are more portable and transferable and therefore more immediate and accessible. This is especially true if they are published in HTML or in some Web-based format and stored on an accessible database;
- e-folios enable audio and visual representations and thus a more three dimensional representation of competencies such as interpersonal skills;
- e-folios are a more effective strategy of showcasing and marketing work. In particular they provide direct evidence through exhibits and artefacts of suitability for selection in promotion and employment before face-to-face interviews are arranged;
- e-folios have the flexibility and adaptability to be modified to suit whatever set of competencies or personal preferences are required at whatever level;
- participation in the actual process of creating a digital portfolio builds self-esteem and self-confidence in professional abilities;
- storage of data is both simple and secure;
- updating and developing is relatively simple; and
- reproducing digital portfolios is relatively simple and inexpensive.

The development of electronic portfolios has the potential to enhance and streamline student learning and development not only for the individuals involved, but for the tertiary sector as a whole.

By creating web portfolios, which include not only implicit links by active Hyperlinks between artefacts and reflections, authors in effect synthesise the products of their learning - both for themselves and for their audiences. (Kimball, 2003, pxvii)

Method

The major aim of this project was to empower students involved in the first year Bachelor of Education Program at a Western Australian university to map and demonstrate their developing professional skills, knowledge and values through the use of electronic portfolios. The unit chosen in which to embed the portfolio approach was titled "Using Computers in the Classroom". This unit was an elective and attracted the current sample (N=30). The unit investigates implementing information and communication technologies (ICT) in the classroom as well as the use of ICT to help develop a tracking system for professional development and reflection. The unit in particular provides opportunities to expand ICT skills with an emphasis on learning in an online world. Throughout the 12 week semester students are expected to attend a two hour face to face workshop as well as participate in ongoing online discussion and activities. The project also aimed to not only enhance student reflection on their individual journey through the course but to provide a solid foundation from which they can continue to reflect and build upon as professionals in the workplace.

Ultimately, a case study approach was adopted, with the case being defined as 30 first year pre-service teachers. Prior to the investigation students completed the *Portfolio Project Questionnaire*. The questionnaire comprised nine open-ended items which asked the students to comment on both the potential structure and content of a portfolio approach. Students were also asked to comment on the possibility of constructing an electronic portfolio and to identify the skills, knowledge and values they deemed essential in such an approach. The sample was also asked to contemplate their conceptualisation of their experience with portfolios. The students were then encouraged to investigate the use and purpose of portfolios in education. A small sample of resources which helped with their investigations can be found at the end of this paper. From these investigations they collaboratively identified the dimensions which best reflected their personal and professional journey through the Bachelor of Education course. Links were made between the sample group and the education and industry requirements which were current at the time through literature and documentation supplied from the Department of Education and Training in Western Australia. Students designed and developed their own working template

which will continue to be used in first semester in 2004. The researchers conducted formative evaluation throughout semester 2, 2003. This formative evaluation took the form of an analysis of the questionnaire, ongoing anecdotal student notes, a focus group and researcher field notes.

Based upon the results of the formative evaluation which was concluded at the end of 2003, modifications will be made to the template. Phase two of the research will involve the students further in the creation and development of the content of each of these dimensions which they developed and modified in 2003. Students will carefully select the artefacts which reflect the dimensions of the portfolio. These artefacts will be customised to accommodate the digital platform being used. Students will be able to negotiate their choice of software that is currently available in the Department of Education. The original template was created by the software Microsoft PowerPoint. The researchers will identify a subset of students (n=10) to mentor through this process in order to monitor their development. This will involve ongoing weekly meetings throughout the semester and the results will be documented as part of the summative evaluation of the project. The major aim of this process is to assist the students in their selection and refinement of artefacts and also their reflection upon their professional development.

Results

This paper reports on phase one of the portfolio project.

Portfolio Project Questionnaire

Prior to the students' initial investigation into the use and purpose of portfolios they were asked to complete the *Portfolio Project Questionnaire*. The results of the questionnaire revealed that the students differed in their conceptualisations of what a portfolio is and what it aims to achieve. The majority of students believed that it was possible to construct a personal portfolio electronically and that it should reflect personal works achieved over time and individual development. A number of students however (n=12) believed that the portfolio should not only present information but should also allow the reader a deeper insight into the life of its creator. In this way the portfolio becomes a living work in progress which charts the life world of the student and allows a credible view of each student from both an intellectual and philosophical aspect. A small number of students (n=3) identified the potential of the portfolio to teach others regarding specific content. This is an interesting result given the fact that these students are only in their second semester of a four year degree and yet they are already conceptualising the importance of utilising a variety of teaching approaches.

The majority of the sample clearly acknowledged the advantages of electronic portfolios when compared to traditional formats. The questionnaire invited students to reflect upon why they thought they were being asked to develop portfolios. The sample indicated a range of responses which included the improvement of their ICT skills, enhancement of future employment opportunities, a way in which they were able to chart their own progress. Most importantly, the students viewed the construction of the portfolio as a way of increasing their own skills in order to replicate a similar process with their future students in a school setting. When asked what skills, knowledge, attitude or outcomes the sample would like their portfolio to reflect the majority of responses indicated that not only did the portfolio need to appear professional but it was also imperative that it was easy to navigate. The sample were once again considering the future application of such an approach with mapping their own students' development. When the sample were asked what evidence they should include in their portfolios their responses were rather immature in that they focussed upon awards, work samples and not reflective practice. This is not surprising given that they are in the first year of their degree course and they have not been exposed to this process or to these products in the past.

Portfolio Dimensions

The definition of the dimensions of the portfolio were devised in a collaboratively way throughout the first five weeks of semester 2, 2003. Students were divided into small groups and were asked to investigate possible dimensions for their portfolios through the examination of existing electronic models. This proved to be an iterative process whereby the sample identified elements of good practice which reflected their individual needs as students and potential teachers. Following this process the entire sample regrouped to identify key dimensions which had emerged as a result of their initial investigations. These initial dimensions proved to be generic and included elements such as, an introduction to the portfolio process, instruction for user navigation, basic contact information, background (educational and personal), printable copies of curriculum vitae, teaching philosophy, goals (short and long term), and overall experiences to date at university. It was decided that these dimensions were to be used as a base from which students were encouraged to develop and implement a more individualised approach. It is interesting to note that the majority of students chose to structure their

portfolios using only the generic dimensions (n=20). Table 1 provides a number of examples of generic and individualised portfolio dimensions.

Generic Dimensions	Individualised Dimensions																																												
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Table 1: Generic and Individualised Dimensions

The majority of students preferred to implement the generic dimensions and this may be the result of the fact that the sample comprised first year students only and as such they had not had the appropriate time frame in which to develop their own personal teaching & learning philosophy. These students had not yet developed a holistic view of the overall outcomes of their involvement in the course and as such were able only to conceptualise components and not the whole. It is hoped therefore that with the continuing development of the portfolio throughout the remaining years of their study that the sample will begin to create links between the components of the course and their own professional development. In addition to this limitation they also had experienced limited exposure to exemplary models of portfolios and this had clearly impacted on their product at the conclusion of 2003.

Conclusion

Piper (1999) asserts that the process of portfolio development should be undertaken slowly with an aim to seek linkages for stakeholders and to be realistic with designs and expectations of the portfolio. She recommends that authors use available models relevant to their design and use, and that ownership of the project needs to be instilled. Timelines need to be clearly established for implementation and the portfolio should also be flexible enough to allow for improvement and growth as it evolves. The results of this study indicate that the approach used enabled the students to achieve a sense of ownership not only in the end product but in the process itself. It is acknowledged that the students are relatively inexperienced in developing such a product, however it is envisaged that their engagement with this process will continue throughout their four year degree. The sample agreed that there was value in participating in the portfolio project and many believed that their experiences enabled them to develop insights into their own life worlds and those of their fellow students.

The great value of the portfolio is in self-reflection. Hackney (1999) concludes that the creation of a portfolio should take into account the highly individualised nature of the process with the emphasis on how one examines

oneself, what value is placed on artefacts and their representation of work completed, and what rationale is used to support the artefact as a reflection of personal growth. As the results indicated a number of the students extended and personalised the portfolio dimensions. Further development in this direction would suggest that these students will engage in closer self examination, both professionally and personally in the future.

Hackney (1999) emphasises that the process should not be oversimplified but must demonstrate the variety, range and depth of student achievement. The process should be collaborative and communication at all phases of development between every participant is crucial. The ongoing nature of the portfolio project will assist the students to increase their interpersonal skills as they work collaboratively over the next three years to complete their own personal portfolio and to mentor fellow students through the process.

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