

Pedagogical Approaches Developed to Support the E-Portfolio

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Abstract

This paper will report on a program development process following an action research cycle to examine ways that e-portfolio development in our teacher education programs have influenced and supported a range of pedagogical approaches, related to technology, socially constructed learning experiences, and reflection on learning. The study found three recurring cycles of actions that reflect the evolution of the project, (1) Technological, (2) Pedagogical, and (3) Formalizing. Three evolving themes have been noted on current reflections on the e-portfolio development: (1) from resistance to awareness; using computers as learning tools; (2) staff support above and beyond their job descriptions; and (3) shifting attitudes to e-portfolios on the part of students and instructors. The paper will conclude with reflections on how the e-portfolio process has allowed our pre-service teachers to take ownership for their learning as they take on the professional role of defining themselves as teachers and developing the teaching profession.

Purposes

This paper describes a three-year program development related to developing an electronic portfolio process (using multi-media storage and retrieval of electronic learning evidence) within a Canadian university. The e-portfolio group consisted of three Faculty members, two instructors, two technology computer services support and the field experience co-ordinator. Importantly, one of the Faculty members of the group became the Associate Dean of Teacher Education (ADTE), a position that allowed direct support of the implementation of the e-portfolio into the teacher education program.

As a group we believed that pre-service teachers' ownership of their learning was critical to enhancing the influence of the teacher education program on them and that the situated learning (Lave and Wenger, 1991) connected to formal knowledge taught within a teacher education program needed to be fundamentally valued. We believed that technology could offer an infrastructure to value such learning by creating an effective means to document and analyze their legitimate engagement in the complex interplay of persons, activities, and ideas as they shifted from student to teacher identity in schools, the local community and university courses. The e-portfolio development process has also caused many instructors to think about their teaching approaches and activities.

In this paper we will we address the following questions: "How has an e-portfolio practice developed within an Elementary teacher education program?" and "How can the e-portfolio process affected pre-service teacher learning, for both students and instructors?"

Context

At the beginning of the e-portfolio development process, a set of Standards drawing from government accrediting bodies in Canada and Australia was developed within the faculty. From these Standards, a matrix was created that cross-referenced courses,

practicum, and related experiences by these standards, allowing pre-service teachers to enter evidence from these sources in an electronic form, mapping how they each addressed the Standards. Each piece of evidence or artifact was selected by pre-service teachers to represent how their learning addressed the Standards. For each piece of evidence, they completed a STARR framework (situation, task, action, response, reflection) that explained how the evidence addressed the specific standard. The instructors in the teaching seminar courses were responsible for supporting pre-service teachers' completion of the e-portfolio process, reading and crediting artifacts and determining whether they fully and appropriately addressed the standards. A checkpoint was created before each practicum where pre-service teachers had to complete a minimum number of reflected-upon artifacts before they could start the practicum. Wide variability between artifacts selected and between interpretations of the learning represented by similar artifacts was noted by instructors and administrators in the program.

Perspectives

Portfolios have been identified as a tool for deep and durable learning, supportive of environments of reflection and collaboration; they are particularly effective for bringing about performance and learning-related change (Bork et al. 1997). A critical outcome of teaching portfolios is that they create the situation where pre-service teachers can become more self-confident about their practice. However, there is a real need to document the impact of e-portfolios on pre-service teacher development (Pechione *et al.*, 2005), as well as to examine how the e-portfolio can be a vehicle for gaining insights on program renewal (Anderson & DeMeulle, 1998). Teacher educators have traditionally struggled with convincing students to work on their portfolios, competing against more traditional assessment demands and the habit of putting the portfolio together at the last minute (Dollase, 1996). Zeichner and Wray's (2001) review of US teacher education programs reported that portfolios encouraged pre-service teachers to: (1) think more deeply about teaching and content; (2) be more conscious of theories and assumptions that guided their practice; and (3) engage in collaborative dialogues about their teaching.

The development of teacher knowledge is critical in the enhancement of student learning in schools (Munby et al. 2001). Research on teacher knowledge has tended to focus on the teacher as an object to be researched, as a complex tool that had to be understood and the knowledge taught to others. However, as Fenstermacher (1994) suggests, the "critical objective of teacher knowledge research is *not* for researchers to know what teachers know but for teachers to know what they know...for teachers to be knowers of the known" (p. 50). This is also true of teacher educators. Typically in teacher education programs, pre-service teachers learn strategies, content and theories of learning, but they rarely study their own learning; they do not think about their own thinking outside of a course, they tend to complete course assignments and move on. The e-portfolio helps them to value their learning beyond each individual course or practicum experience.

Theoretically, the e-portfolio project draws on social constructivist notions of learning, in particular situated learning, joint activity and semiotic mediation (Dewey,

1910; Lave & Wenger, 1991; Wertsch, 1985). Drawing on complexity science (Davis et al., 1999) and applying it to teacher education (Clarke *et al.*, 2005) we have come to believe that learning is a process in which a student and a teacher become capable of more sophisticated, more flexible, more creative action as they work in a system with continuous feedback loops that allow adaptations and reframing of learning.

Modes of Inquiry: Data sources and Discussion

Adopting a cyclical process modeled after practitioner action research, the group met on a regular basis to support the development of the e-portfolio practice. Data was generated at meetings from members of this group. Notes from 19 meetings were taken over the three years, key events recorded, plans followed up on with observations and reflections from group members and data was collected as the need arose. In addition, notes were taken of members' perceptions and anecdotes on the project. Re-reading and synthesizing was conducted by one participant then shared with the group. His analysis included re-reading the data, noting recurring topics and issues, connecting these to actions and then mapping the progress of the project over the three-year period. A summary report was created and circulated to the group members pre-service teachers (a mix of gender, range of success with the e-portfolio process and from different programs) in the first cohort using the e-portfolio, were interviewed by a member of the team. The interviewer gathered their perceptions on the e-portfolio process and how the process could be developed further.

Findings from students, staff and Instructors

Three recurring cycles characterized the development of the process of plan, act, observe, reflect, then re-plan and so on.

(1) Technological cycles of action

As students entered the program in 2004 a survey revealed their very low confidence with computer skills, especially in relation to creating and developing a website, and a lack of access to web-editing software. The first plan of action for the group at the beginning of 2005 was to address the lack of computer skills for the majority for the students. An e-portfolio template was created and a series of computer workshops were set up for each seminar class and additional drop-in sessions created where students could go to get individualized assistance. The cycle is reflected by repeated attempts to improve student access to web editing software, refining the e-portfolio template, education of seminar instructors to support the use of the electronic form, creation of storage space to securely contain artifacts and most recently, with the development of a Structured Query Language (SQL) database that allows students to retrieve, add and delete elements from their personal record set. The new system allows students to customize their own web interface, generates summary quantitative reports for all students showing type of entry, when entered, standards addressed and sources of evidence.

Staff support above and beyond: Technology support staff and field experience coordinators made the e-portfolio a priority within their working day. They helped refine the e-portfolio framework, created on-line tutorials and maintained website support. In short, they have sustained an on-going e-portfolio process that could not be created by

faculty or instructors. As one student said about there appreciation of a tech support staff, “He’s so helpful, we buy him chocolates!”

(2) Pedagogical cycles of action

This phase refers to the implementation of the e-portfolio as a reflective tool in order to help students develop as teachers. Through 2005 and 2006 the e-portfolio tool was taught to program course instructors through professional development workshops. Initially, there was resistance to the initiative; instructors and students saw this as a make-work project and as disconnected from the work of the teacher education courses. Even one of the program development team who taught a seminar class in year three of the program found himself unwilling to changing his course to add in discussions about the e-portfolio process.

In 2006, the Faculty made a commitment to use the e-portfolio to address the accrediting body requirements to show how the standards were being addressed in programs. It was then mandated by the Associate Dean that the seminar courses take responsibility for checking that students were putting artifacts into their e-portfolios. For students to be recommended for teacher certification they had to show that they had addressed the standards through learning experiences in the program.

By the Fall term in 2006 the seminar leaders made time in their courses for students to prepare their STARR artifacts before going to the lab, enabling students to identify significant artifacts, pair up with another student to share and edit, and then to share in a large group. The fundamental shift in attitude to the e-portfolio came at the end of the Fall term in 2006 when the first cohort of students completed their practicum and did an exit interview in preparation for applying for a job. A three-person panel of Faculty members interviewed each student. In the seminar classes the students were given the exit interview protocol and given guidance on how to prepare. It was clear that as students drew on their e-portfolios for examples to answer questions they became more coherent and passionate about their experiences. Each example showed a real celebration of thoughtful and exciting lessons developed in schools and linked back to ideas taught in courses. All the interviewers were excited by what they heard and inspired by the experiences shared.

From resistance to awareness; Computer as learning tool: Initially, students’ fear of using computers beyond word-processing and e-mailing, perceived lack of time and lack of instructor comfort, led to very vocal and angry resistance to the e-portfolio. However, with repeated computer orientations, peer support and consistent leadership, students started to see the potential and took pride in their work. As one student said, “Most rewarding looking at it right now and seeing a finished product...seeing how far I’ve come...see all my work in one spot.”

(3) Formalizing e-portfolio practice cycles of action

Initially, the e-portfolio practice relied heavily on volunteer support. Over the two years of the project all the students learned how to edit and link their e-portfolio using a web-page editor. The computer support team did 52 e-portfolio support sessions. All these sessions were additional to normal workload. Realization of the importance of students learning, these technology skills result in an upgrade of the Information

Technology (IT) course from 24 hours to 36 hours of contact, and with program re-organization the course was placed in the first term of the programs.

Professionally framing the e-portfolio practice has been a critical element in setting students up to see the process as useful and necessary. Initially pre-service teachers were told they could see themselves as either “guinea-pigs or pioneers”; that this was an innovation that would be developed through trial and error and their support. Many students embraced the pioneer role with a commitment to the portfolio assessment idea, however a vocal minority kept complaining despite the efforts to support their learning.

It became critical to send out a consistent message to set-up the e-portfolio purpose and to reinforce it was needed to graduate. Each cohort of students who entered the program received a program orientation that addressed the e-portfolio and the standards. The Associate Dean visited the first seminar classes that students took in the program to frame the e-portfolio practice, reinforce that it had to be done, and to answer questions. It became noticeable that each term these briefing meetings get less problematic with students becoming keener and more interested, often commenting on how excited they were to begin the process.

Shifting attitudes to the e-portfolio: Initially, faculty largely ignored the e-portfolio and many students either delayed completing the e-portfolio or simply included artifacts with minimal reflection. However, the ongoing and sustained support caused several students to create model e-portfolios that they shared with pride and confidence. As one student stated at the December, 2006 Faculty of Education meeting,

Completing my portfolio allowed me to realize how much I have learned from many of the people sitting here and how many different things many of my colleagues had learned at the same time. This has been a very worthwhile program...thank you.

Conclusion

The new database system with the e-portfolio matrix allows:

1. instructors to see students’ progress and note the learning experiences they select
2. the program coordinators to note standards that the program does not address effectively, allowing fine tuning of course requirements and expectations.
3. students to reflect on their learning across courses and to note the development of their own reflective thinking about their learning.

The new system afforded by the e-portfolio creates the potential for our teacher education program to become, as complex learning theories states, a self-organizing system where each participant becomes part of a mass of local inter-connections (Davis, 1999). As we move into the next stage of the project we are focused on how the e-portfolio, collaboratively acted with colleagues, encourages what Zeichner (1995) describes as “inside-out” process where teacher candidates’ personal experiences are then imbued with authority and their voices acknowledged and validated.

Educational Importance

It is critical in teacher education that we acknowledge and understand the development of teacher knowledge. We believe that the e-portfolio, as a cross-program

initiative, will help us to better understand students' development as teachers as it creates an infrastructure to connect pedagogical practices across courses and course assignments.

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