

# Researching the Process and Outcomes of Electronic Portfolio Development in a Teacher Education Program

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**Abstract:** This session will present the results of a preliminary study of teacher candidates' electronic portfolio development efforts, student attitudes and skills developed during the process, and some preliminary conclusions. From these efforts, a proposed survey instrument will be presented that can be used by other Schools of Education, to collect a national sample to inform electronic portfolio development efforts which demonstrate both student and program outcomes. Attendees at this session will be invited to participate in a nation-wide data collection effort on electronic portfolio development and use in Teacher Education programs.

## Introduction:

The process of developing electronic teaching portfolios can document evidence of teacher competencies and guide long-term professional development. The competencies may be locally defined, or linked to national teaching standards. Two primary assumptions in this process are: 1.) a portfolio is not a haphazard collection of artifacts (i.e., a scrapbook) but rather a reflective tool which demonstrates growth over time; and 2.) as we move to more standards-based teacher performance assessment, we need new tools to record and organize evidence of successful teaching, for both practicing professionals and student teachers.

One of the most exciting developments in the reform of teacher education programs is the use of alternative forms of assessment to evaluate student learning, and one of the most popular forms of authentic assessment is the use of portfolios. The point of the portfolio (electronic or paper) is to provide a "richer picture" of a student's abilities, and to show growth over time.

This paper will look at an emerging theory of electronic portfolio development and its use as a method to collect and organize performance assessment data on a cohort of interns in a restructured Teacher Education Program. Based on both the literature on portfolio development and multimedia development, the author has identified at least five stages of electronic portfolio development: 1.) Defining the Portfolio Context and Goals (purpose and audience); 2.) the working portfolio (collection); 3.) the reflective portfolio (selection, reflection, and direction); 4.) the connected portfolio (connection); and 5.) the presentation portfolio (celebration, publishing).

Electronic portfolio development draws on two bodies of literature: multimedia development (decide, design, develop, evaluate) (Ivers & Barron, 1998) and portfolio development (collection, selection, reflection, projection) (Danielson & Abrutyn, 1997). Both processes are complimentary and essential for effective electronic portfolio development. Understanding how these two processes fit together, along with understanding the role of standards in electronic portfolio development, will provide teachers and students with a powerful tool for demonstrating growth over time, which is the primary value of a portfolio.

There is currently an ambiguity in the literature about the benefits of developing electronic portfolios over the traditional use of paper-based portfolios most often stored in 3-ring binders (Zeichner, 2000). Some of this ambiguity may be due to the lack of widespread training and implementation of e-portfolios in Teacher Education programs and the lack of a conceptual framework, which has resulted in limited empirical research on electronic portfolios. Sheingold (1992) asserts that technology support in assessment allows students and teachers to make work in many media accessible, portable, examinable, widely distributable, and makes performance replayable and reviewable. Barrett (1998) proposes the following benefits for using technology to develop portfolios: creating an electronic portfolio will result in increased student teacher or faculty member's hands-on technology skills; many documents are initially created in digital format, faculty or teachers modeling portfolio development are more likely

to have students who benefit from portfolio construction; and the portfolio construction process can be easier to manage, especially with storage and presentation or sharing with colleagues. With more widespread training in electronic portfolio development to address both teaching standards and the NETS for Teachers, and work with consortia of teacher educators, such as UNITE and MC squared, there should be an increase in empirical research on the use of technology to support assessment and electronic portfolios.

In 1999 and again in 2000, our university received two PT3 grants along with a Title III Partnership Grant to restructure our teacher education program. Four goals for the PT3 project address the needs to redesign the program, to provide faculty development, and to provide technology experiences for students throughout the program.

1. Program Development: Preservice teacher education programs will be redesigned to reflect best practice and include the infusion of appropriate technology.
2. Faculty Development: Faculty will have the training they need to successfully integrate technology into their courses.
3. Student Development: Students will have experiences that enable them to demonstrate effective and appropriate use of technology based on ISTE/NCATE standards.
4. K-12 Partnerships: School districts will become full partners in the preparation of new teachers, through shared training, program planning, PD Schools, and modeling best practices.

A major element of the Student Development component of this PT3 grant is the implementation of electronic portfolios to support documentation of professional growth and provide a framework for career-long professional development. After a year of planning with partners in K-12 and the private sector, the first cohort of students in a brand new 11-month post-baccalaureate program began in July, 2000. In June, 2000, the new ISTE/NCATE Foundations Standards were released. This program evaluated the technology skills of the interns at three points in the program: the General Preparation Standards at the end of their Foundations class (August, 2000); the Professional Preparation at the end of their first semester of combined Methods/Internship (December, 2000); and the Internship at the end of their Capstone course (June, 2001).

## **Research Questions**

This research project looked at the impact of developing an electronic portfolio on the acquisition of technology skills as well as providing insight into the following questions:

1. Does creating an electronic portfolio enhance a teacher candidate's self-esteem?
2. Does creating an electronic portfolio enhance a teacher candidate's multimedia development skills? (Does constructing an electronic portfolio develop competency and demonstrate achievement of both Teaching Standards AND the ISTE National Educational Technology Standards?)
3. Do interns understand the multiple purposes that can be met from creating an electronic portfolio?
4. What type of support system is needed by interns to develop their electronic portfolios, and are certain types of support are more useful than others?
5. Will multimedia skills gained from the process of developing electronic portfolios transfer to student use in the classroom?
6. Is there a positive relationship between the time spent developing the electronic portfolio, and the teacher candidate's attitude toward their portfolio and whether they will use it in the future?
7. After having full time access to a laptop computer, will interns want to purchase one when they get a teaching job?

## **Methodology**

### **Electronic Portfolio Development Process 2000-2001**

The interns received an introduction to electronic portfolio development in August, 2000, and were alerted to the fact that they needed to begin collecting digital evidence of achieving both our State Teaching Standards and the

National Educational Technology Standards for Teachers. By the middle of August, 2000, they each received use of a laptop computer for use during the rest of the school year. A workshop was held on how to use a database to keep track of the evidence that they would collect during the program. In November, 2000, the interns were introduced to using Microsoft Word to build a reflective portfolio, and each of them created a basic reflection document, based on our State Teaching Standards and ISTE National Education Technology Standards #1, 5, and 6. A small group made presentations to their PDS mentors and university faculty.

In May, 2001, the interns enrolled in a Capstone course, the purpose was to reflect on their experiences over a very intensive year, and to build their electronic portfolio. Through five weeks, the interns used Word, PowerPoint, Adobe Acrobat and iMovie to create reflective portfolios, pressed to CD-ROM, that demonstrated their achievement of our State Teaching Standards and all six ISTE NETS Standards. The last week before their presentations was a very intense experience, with many hours spent with lab aides and the instructor (the author of this paper) in the School of Education computer lab.

Each teacher candidate created a presentation on their portfolio, and led an hour-long discussion on the highlights of their year, attended by principals, mentor teachers, university faculty and fellow students.

After their presentations were over and their portfolios complete, all of the candidates were asked to complete a survey, which contained six open-ended questions and four multi-part, multiple choice questions. Of the 19 interns who made final presentations of their portfolios, 18 completed this survey.

## Results

An analysis of the multi-part, multiple choice questions indicates the following results:

The interns found the following sources of support most useful (50% or more indicated these items were “very useful” or “could not have completed the portfolio without it”):

- Full time use of a laptop computer
- Handouts provided by instructor
- Templates provided by instructor (in PowerPoint and Excel)
- Open lab hours
- Lab aide assistance in lab
- One-on-one meetings with instructor
- Help from a friend or relative

Sources of support found less useful by a majority of the candidates were:

- Class sessions in lab
- Internet-based tutorials

When asked when they learned to use specific multimedia skills, it was discovered that a majority of the interns learned the following skills either before they entered the program or during the first semester:

- Set up **folders** to organize files on computer hard drive (89%)
- Use the **Location Manager** on the iBook e.g. to reset printer, AppleTalk and Internet connection (TCP/IP) Preferences when moving between UAA, school, and home. (67%)
- Use advanced features of **Microsoft Word** (Document Map, Hyperlinks, etc.) (67%)
- Use a **digital camera** to take pictures (61%)

The following skills were gained by a majority of the interns during the Spring Semester or the Capstone course, as they developed their electronic portfolios:

- Use **File Sharing** to copy files to and from laptop and another computer (89%)
- Use advanced features of **Microsoft PowerPoint** (66%)
- **Scan** images with a desktop scanner (66%)
- **Transfer video** into a computer for editing using either Digital Video camera or analog-digital video converter (in lab) (83%)
- **Edit a digital video** (using iMovie or other software) (83%)
- **Record digital audio** to the computer with a microphone (67%)
- Create and edit **Adobe Acrobat** files from a variety of computer applications (100%)
- “Burn” a **CD-ROM** (78%)

All but two interns indicated that they “Probably Will” or “Definitely Will” use these multimedia authoring skills with their students when they get their own classroom.

More than two thirds of the interns stated that they “Probably Will” or “Definitely Will” buy a laptop computer when they get their first teaching job. In fact, it was difficult for many to give up their laptops when their portfolios were completed.

Further analysis of the qualitative data has yet to be completed, to respond to some of the other research questions mentioned earlier. This data analysis will be included a later paper, which will also include follow-up interviews with the teachers, now that they are in the classroom.

## **Conclusions and Recommendations**

The results of the survey were shared with the administration of the School of Education, to raise the awareness of the faculty on the need to reinforce technology skills throughout the program, and to support the electronic portfolio development in every course. In addition, an Electronic Portfolio Handbook was developed on CD-ROM that was given to the second cohort of students in July, 2001. The Step-By-Step tutorials included on the CD provided support for self-directed learning on many skills that were found lacking until the Capstone course.

A new model of electronic portfolio development was developed, based on the results of the first year’s experience, that reinforces the multimedia development skills through every term. This new model is attached as an image file. The presentation on this paper will also report on the progress of the second cohort of Interns, as they progress through the 2001-2002 school year.

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