

2008

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Recommended Citation

Smith, Steven B.; Cook, Christopher M.; Faulkner, Shawn A.; and Peers, Michele G. (2008) "Electronic and Paper-Based Teaching Portfolios: Student Perceptions and Recommendations," *Kentucky Journal of Excellence in College Teaching and Learning*: Vol. 6 , Article 5.

Available at: <https://encompass.eku.edu/kjectl/vol6/iss1/5>

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Electronic and Paper-Based Teaching Portfolios: Student Perceptions and Recommendations -----

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This paper documents a yearlong pilot study, conducted by teacher education faculty, to evaluate methods for creating, sustaining, and assessing teaching portfolios. Selected issues with paper-based and software-based programs are compared. Key design, instructional, and procedural problems that arose during this study are discussed as well. The findings of this study support the need for a flexible electronic portfolio system in which students play a key role in the design, development, and content of their portfolios as well as the need for a clearly articulated academic purpose and requirements for the teaching portfolio with implications for students in all disciplines.

Keywords: *electronic portfolio, ePortfolio, teacher education, portfolio*

Student Perceptions and Recommendations

A portfolio is generally viewed as a compilation and reflection of one's work, efforts, and progress (Milman, 2005) and is often the best way to get a sampling of the breadth and depth of a person's work conveying one's range of abilities, attitudes, experiences, and achievements. The portfolio has been embedded, in one form or another, for some time within higher education as a way to document educational experiences of preservice teachers. The benefits derived from the use of portfolios in teacher preparation are well documented. Guillaume and Yopp (1995), Shulman (1987), and Wolf (1991) demonstrated that systematic input of student work into a portfolio can accurately chronicle the development of students' skills, knowledge, and commitments over time. Lyons (1998) also argued the value of portfolios in providing the necessary scaffolding for shaping reflective teacher behavior in the future. While there are many recognized types of portfolios (i.e., employment, artistic, teaching), this study examined the use of teaching portfolios in the professional development of preservice teachers.

Review of Literature

The use of digital media to create electronic portfolios is a growing trend among teacher education institutions, and research in the area of electronic portfolio effectiveness in teacher education is starting to emerge. To date, research has centered on the perceptions of the portfolio process and the purpose of the final product by preservice teachers (Milman & Kilbane, 2005; Sherry & Bartlett, 2005; Strudler & Wetzel, 2005) as well as various reports on how teacher education institutions are implementing and designing electronic portfolios in their programs (Williams, Davis, Metcalf, & Covington, 2003; Gathercoal, Bryde, Mahler, Love, & McKean, 2002). Barrett (2000) established five levels of portfolio development that emphasize student participation and expression, the growth and development of the portfolio as a learning process over time, and the value of process and creativity. In addition, Wade, Abrami, and Sclater (2005) highlight the importance of active student participation in the development of portfolios to enhance the learning experience for the students.

The Teaching Portfolio

The development of teaching portfolios can be a dynamic process in which the reflective nature of the portfolio is vividly expressed and not simply presented as a static end product or graduation requirement. This dynamic quality is achieved by considering teaching portfolios as comprising several important interrelated components – creating and assembling portfolio-relevant materials, reflection, assessment, and sustainability, with emphasis on creativity.

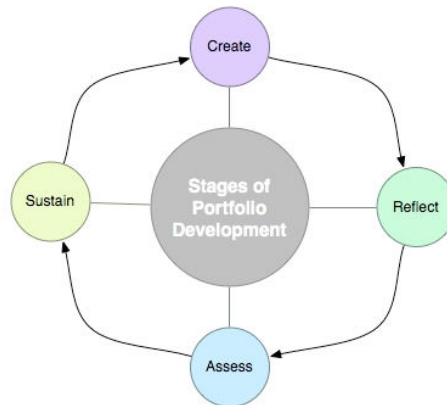


Figure 1: Stages of Portfolio Development

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Originally, teaching portfolios consisted of a collection of paper artifacts. However, with the increased presence of digital technologies, portfolio development has evolved into a richer, more interactive collection of artifacts. The teaching portfolio has been described as a structured collection of artifacts which document coached or mentored acts of teaching, sustained by samples of student work and reflective writing, deliberation, and conversation (Shulman, 1998). Today, with the use of digital technologies, teaching portfolios can include multiple elements such as digital images, electronic presentations and other forms of rich, interactive artifacts, reflections, and documents that support the student's understanding of what it means to be a teacher.

The electronic portfolio (sometimes referred to as digital portfolios, e-folios, ePortfolios, and web-folios) can be an entirely different product as compared to the paper-based teaching portfolio because the materials are created or converted to digital documents or media (Hawisher & Selfe, 1997). Strudler and Wetzel (2005) characterized the differences between electronic and paper-based portfolios as technological and not necessarily conceptual. However, there are notable benefits of the electronic portfolio over the paper-based portfolio. Technological enhancements make it easier to search, retrieve, change, and reorganize information, which can result in a reduction of effort and time. Other advantages to creating an electronic portfolio include flexibility, creativity, and function. Those creating an electronic portfolio can include and display more types of information about their experiences, link to web-based information and resources, and exhibit a level of creativity that is technology-driven.

Electronic portfolios provide a medium in which students can organize a complete and authentic representation of their work electronically, thereby alleviating the need for cumbersome materials and encyclopedic binders. In addition, electronic portfolios also offer the potential for more creative outlets for demonstrating a wide range of proficiencies (Chang, 2001; Love & Cooper, 2004; Abrami & Barrett, 2005; Wall, Higgins, Miller, & Packard, 2006). Furthermore, electronic portfolios accommodate a variety of media such as audio (readings, music), video (performances, observations, case studies), three dimensional representations (graphics), and hyperlinks to web resources, all in a neat, non-linear arrangement. This level of "flexibility of arrangement and selection fosters student ownership of personal effort" (Farmer, 1997, p.30). The organization of an electronic portfolio allows for combinations of various media such as word processing, web authoring, and multi-media presentation software to create digital display that can be stored and transported in a variety of formats – CD-ROM, DVD, web page, or flash technology. How students publish their portfolios depends on the resources available to them at the time and the requirements of their institution. Electronic portfolios, on the web or on a flash

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drive for instance, are easily accessed and documents are generally not lost or altered when shared or submitted for assessment.

Challenges to creating electronic portfolios often include a lack of focus on requirements and content by the student who is likely to focus more on technology (i.e., visual appeal, function), lack of specific software to create and view electronic portfolios (i.e., Adobe Acrobat®, Microsoft PowerPoint®, access to the Internet), convenience of the electronic format, amount of time needed to complete the electronic portfolio, limited experience with technology, and real or perceived availability of support. In addition, assessment of the electronic portfolio presents its own challenges. Abrami and Barrett (2005) assert that it is difficult to authenticate the artifacts contained in an electronic portfolio. Furthermore, the assessment criteria need to be clearly defined (Carliner, 2005). These challenges often figure prominently in the students' thinking about their electronic portfolios and their final products.

The real benefit of any portfolio lies in the student's ability to communicate to others his or her educational experiences. Electronic portfolios offer preservice teachers the opportunity to focus and reflect on their experiences (Wade & Yarbrough, 1996) and document their progress over time (Smith & Tillema, 2003). This reflection and documentation enhances the development of communication and organizational skills (Brown, 2002). Studies of student perceptions of portfolios have shown that portfolios promote the development of student insight into teaching (Zidon, 1996). However, only a few are designed to allow a student a wide range of expressive outlets to create a personal portfolio. Depth of reflection and solid reasoning behind the selection of specific artifacts are generally predictors of successful portfolios (Abrami & Barrett, 2005; Smith & Tillema, 2003; Wade & Yarbrough, 1996). This communication may be enhanced by the level of active involvement displayed by the student in the electronic portfolio. Electronic portfolio systems offer the student a highly customizable presentation mode for organizing their knowledge, skills, and materials.

Framework

Teaching portfolios have been used for a number of years in the preservice teacher education program to help teacher education students reflect on the processes of learning and teaching and to help them to convey this information to others. Until recently, the portfolio format utilized by faculty and students had been a paper-based, open-ended task design which explored the art of teaching through various lenses including state teaching standards, student artifacts, student evaluations of learning environments, and student reflections of their educational experiences. Though the paper-based portfolio system served

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its intended purposes, the College recognized the trend toward electronic portfolio designs which allowed for maximum flexibility and student creativity while incorporating the technology skills required of new teachers. Responding to the trend of teacher preparation institutions to transition from paper-based teaching portfolios to electronic formats, the College examined the feasibility of implementing an electronic portfolio system that would assist students with the creation of electronic portfolios as well as assess students' professional development. After much discussion, the faculty chose to implement a pilot program with a select group of students using a commercially available electronic portfolio software program. Examination and evaluation of the year-long pilot program provided the context for this study.

After online exploration, corporate demonstrations, and reviews of several notable commercially developed electronic portfolio systems, a commercially produced product was selected. The following criteria were used in making the decision:

- **Ease of use/Flexibility** – How well would students and faculty adapt to using the software program? What were the strengths and weaknesses of the program? What were the students' concerns about using the program? How flexible was the program? Could the program help the College achieve its growth goals?
- **Cost** – What were the initial and ongoing charges associated with the program?
- **Data Aggregation** – Did the system have the ability to import/export data to/from existing Student Information Systems (SIS)? How flexible were the reporting features? Could we combine data with our current assessment data and get an aggregated view of all of the data?
- **Customization** – Was there a model flexible enough to support our existing conceptual framework, artifacts, standards, rubrics, transition points, surveys and reports?
- **Location** – Would the major components of the system rely on outside vendors and their technology? Where would sensitive data be stored?
- **Support** – What support was available for students and faculty?

The selected commercial portfolio system was a web-based electronic system that provided a full host of features for users to establish and maintain an electronic portfolio and collect and aggregate data related to the portfolios and assessments of the portfolios. In the system students upload files (portfolio documents/artifacts) to the system server and create links to them using a template (webpage) provided by the commercially developed portfolio provider. The entire process is form-driven, meaning that students do not need to know how to compose and display web pages (HTML coding) or other advanced

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technologies to use the system. Their experience was similar to using popular course management systems like BlackBoard, Moodle, and WebCT.

Over the course of one academic year, selected faculty and 27 teacher education students tested and evaluated the chosen commercially produced electronic portfolio system. During the pilot, several questions arose such as: Do we need a system that has features we do not use? Can we identify the needed features? Can we design our own electronic portfolio system with only the features we need? These questions led to the development of a third portfolio system which was added to the pilot project to allow for additional comparison between electronic portfolio creation and assessment tools. Incorporating the stages of portfolio development that the faculty team had been utilizing (see Figure 1), as well as Barrett's (2000) five levels of portfolio development, the faculty team developed the third electronic portfolio system.

Stage	Definition
Defining Stage	Identify the purpose of the portfolio.
Working Stage	Know which goals or standards you are trying to demonstrate and determine the types of portfolio artifacts to be collected. Select the software development tools most appropriate for the portfolio context and the resources available
Reflective Stage	Review the reflective statements written for each artifact, elaborating on its meaning and value and why you are selecting it for your portfolio.
Connected Stage	Convert documents into electronic formats and create hypertext links between goals, work samples, rubrics, and reflections. Insert appropriate multimedia artifacts. Create a table of contents to structure the portfolio
Presentation Stage	At this stage, record the portfolio to an appropriate presentation and storage medium

Table 1: Barrett (2000) Five Levels (adapted from Barrett, 2000)

The faculty-designed system was immediately known as the “flash model” for its use of the USB flash storage device. This model sought to take advantage of instructional models used within the College of Education and Human Services (COEHS) as well as common software tools that could be used

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to create and store an electronic portfolio. In addition, a database was developed to provide a simplified assessment tool that was designed around first year (entry level) rubrics for the assessment of student electronic portfolios. Sixteen students enrolling for the first time in the spring of 2006 participated in the flash model pilot. Students did not require access to any “system” in the flash model to create and manage their portfolios. Instead, their portfolios were created using common software such as Microsoft Word®, PowerPoint®, and Web-based design applications which were saved on their portable USB flash drive. When students required assistance, or requested an assessment of their portfolio, they would simply bring their flash drive to the instructor.

Purpose

Though the original intent was to “test drive” a commercially-developed program, report on its effectiveness, and make recommendations for implementation to the COEHS, the study soon expanded to include a comparison of the paper-based portfolio and electronic formats (commercial and flash). As the study progressed it became evident that the pilot program afforded the faculty the opportunity to not only examine and report on the transition from a paper-based to an electronic portfolio format, but it also allowed the faculty to uncover student perceptions of the portfolio process regardless of format. Faculty could both recommend an electronic portfolio format and improve the development process for students. Therefore, the purpose of this descriptive study became three-fold:

1. to examine the transition from a paper-based portfolio to an electronic portfolio in a teacher education program;
2. to compare the benefits and limitations of three portfolio systems: paper, commercially developed, and internally developed; and
3. to more clearly understand students’ perceptions of the purpose and process of portfolio development, regardless of the portfolio system used.

In addressing the three-fold purpose, the researchers sought not only to make programmatic recommendations, as was the initial intent of the pilot program, but also to recommend changes in the overall portfolio development process that would enhance its value to the students.

Data Sources and Methods

The portfolio pilot project reported in this study spanned a period of twenty-four months, beginning with the research and selection phase in January 2005, followed by the implementation of the commercial product in October

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2005 and the implementation of the flash model in January 2006. The initial participants in the pilot project included all undergraduate middle grades education majors who were enrolled in their first semester (Admissions Semester block) in the COEHS. A total of 27 students were enrolled in the Admissions Semester block when the College implemented the commercially produced system in October 2005. The pilot expanded in January 2006 to include 16 new participants using the flash drive model, and it expanded even further in August 2006 to include all 130 undergraduate education majors (elementary, middle, and secondary) in the respective Admissions Semester blocks.

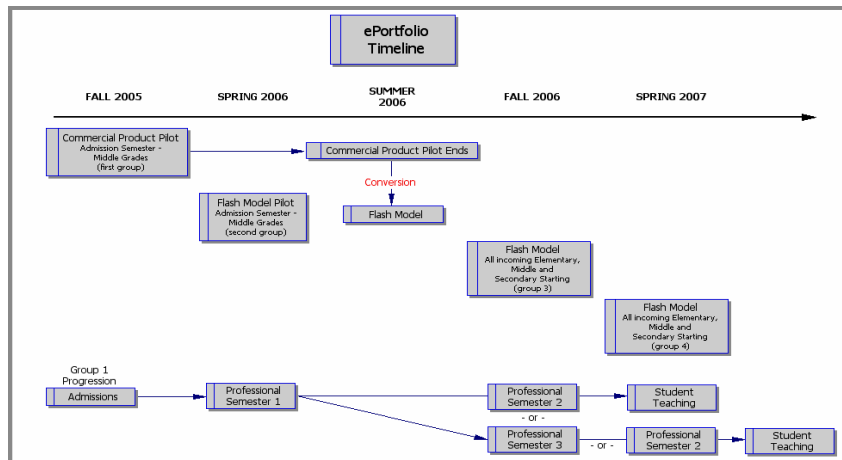


Figure 2: ePortfolio Timeline

Data for this study were collected using a survey instrument in May 2006 following the first year of the pilot program and again in December 2006 following the first semester of full implementation in all undergraduate education programs. The researchers developed the survey that consisted of 2 demographic items, 15 Likert-type items, and 6 open-ended response items. The survey was distributed in an online format as a link embedded in an email that was sent to teacher education students participating in the three portfolio systems: paper, commercial, and flash drive. The 62 students already developing a paper portfolio were invited to participate in the survey to allow for comparison of the three systems.

Taking into consideration both administrations of the survey, of the 62 students using the paper portfolio system, 52 responded (83.8%). Twenty of the

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27 students (74.0%) using the commercially produced system participated in the survey, as did 58 of the 146 students (39.7%) who used the flash drive model. In total, 130 of the 235 pilot study participants responded to the survey for an overall response rate of 55.3%.

Portfolio Type	Total Participants	Number of Survey Respondents	Percent Responding
Paper	62	52	83.8
Commercial	27	20	74.0
Flash Drive	146	58	39.7
Total	235	130	55.3

Table 2: Portfolio Pilot Study, Survey Response by Portfolio Type

Data for both administrations of the survey were aggregated and analyzed using mixed methodology. The researchers calculated the percentage of respondents who selected each level of the Likert scale for each survey item. Additionally, open-ended response items were analyzed for trends and themes that arose in the students' written responses.

Results

Based on the overall results of the survey administered to all students participating in the portfolio process, the perceptions of students about the portfolio process were positive. The survey questions sought information on purpose, control, support, and technology. In exploring the purpose of the portfolio, the majority of participants (83%), regardless of the type of portfolio completed, indicated that completing the portfolio had some influence on their feelings of professionalism, 94% revealed the portfolio reflected to some degree their mastery of teaching standards, 76% indicated the portfolio had some influence on their current or future classroom practice, and 86% believed the portfolio was at least somewhat valuable in job interviewing (see Table 3). When analyzing responses based on the type of portfolio students completed, responses were fairly similar, though students completing the paper portfolio reported slightly higher levels of influence in professionalism, mastery of teacher standards, and value in job interviews. Students completing the flash model reported the greatest level of influence on current or future classroom practice.

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Statement	Very Influential & Influential	Somewhat Influential	Not at All Influential
Rate the influence of the portfolio on your feelings of professionalism. (n=130)	48.4%	34.6%	16.9%
To what degree does the portfolio reflect mastery of the teaching standards? (n=130)	47.6%	46.1%	6.1%
Rate the portfolio's influence on your classroom practice (or potential practice). (n=130)	34.5%	41.5%	23.8%
Rate the value of the portfolio for job interviewing. (n=130)	45.3%	40.7%	13.8%

Table 3: Perceptions of the Purpose for Developing a Portfolio

About half the students indicated the purpose of the portfolio was to highlight their skills, talents, and accomplishments during their teacher preparation program, document professional growth, and serve as a valuable resource for future interviews. For example, one student responded that the purpose was, "To present to faculty and administrators the various things we are capable of accomplishing. To show them, 'Look what I've done and I'm just getting started. Imagine what I'll be able to do when I'm working with kids'" (personal communication, 2006). Others added, "To showcase our ability and learning experience, organize useful material for future use, gain understanding of teaching concepts and responsibilities, and to emphasize variety and creativity in our teaching methods" (personal communication, 2006) and "My portfolio will serve as a guide of my education for my future employer. Also, it is useful to see what I have done over the semester, what I have learned, and

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what I can take with me in my future career” (personal communication, 2006). Though few in number, some students viewed the portfolio as simply a requirement for completing the teacher education program and saw little value in connecting to their professional careers. For example, one student stated, “Sometimes I feel it is an exercise for jumping through hoops. I will not bring a portfolio into an interview and ask them to look over it” (personal communication, 2006). In terms of the control, the majority of respondents indicated they felt some control over the contents of the portfolio but had limited control over the format. All three types of portfolios reported high levels of control over the contents, with the paper-based portfolio at 85%, commercial product at 80%, and the flash model at 72% (see Table 4). On the other hand, students’ perceptions on the format of the portfolio are not as favorable for all types of portfolios. In fact, nearly 35% of both the paper and commercial portfolio respondents felt they had control over the format, whereas, slightly less than 64% of the flash model respondents reported having control over the format of the portfolio.

Statement: How much control do you feel you have over the CONTENTS included in your portfolio?

Portfolio Type	A Great Deal & Some Control	Little Control	No Control
Paper (n=52)	84.6%	15.4%	0%
Commercial (n=20)	80%	20%	0%
Flash Model (n=58)	72.4%	24.1%	3.4%

Statement: How much control do you feel you have over the FORMAT of your portfolio?

Portfolio Type	A Great Deal & Some Control	Little Control	No Control
Paper (n=52)	34.6%	38.5%	26.9%
Commercial (n=20)	35%	30%	35%
Flash Model (n=58)	63.8%	22.4%	13.8%

Table 4: Perceptions of Control over the Development of the Portfolio

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In analyzing the level of support that existed for students completing the portfolio, the type of portfolio being created made a difference. Students completing the paper portfolio appeared to have a more favorable perception on availability of faculty, value of feedback, and clarity of guidelines and expectations. The most significant difference was in the value of the feedback provided by faculty (see Table 5). Almost 62% of paper portfolio respondents believed the feedback they received from faculty was valuable compared to about 42% of the respondents on the flash model and 25% on the commercial product. Paper portfolio respondents also reported higher rates of faculty availability, with 65% indicating faculty were available to answer questions and concerns as compared to 59% for flash model respondents and 45% for commercial product respondents.

Statement: How valuable was the feedback provided by faculty concerning your portfolio?

Portfolio Type	Very Valuable & Valuable	Somewhat Valuable	Not at All Valuable	No Feedback Received
Paper (n=52)	61.6%	23.1%	3.8%	11.5%
Commercial (n=20)	25%	50%	15%	10%
Flash Model (n=58)	41.4%	46.6%	3.4%	8.6%

Statement: Rate the availability of faculty to assist with your portfolio questions and concerns.

Portfolio Type	Always Available & Available	Somewhat Available	Not at All Available	Did Not Need Assistance
Paper (n=52)	65.4%	25%	1.9%	7.7%
Commercial (n=20)	45%	50%	0%	5%
Flash Model (n=58)	58.6%	37.9%	1.7%	1.7%

Table 5: Perceptions of Faculty Feedback and Availability during Portfolio Development

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Furthermore, a higher percentage of the paper portfolio respondents reported that the guidelines and expectations for their portfolio were clearer than the respondents of the two electronic formats (see Table 6). In fact, only 45% of the commercial product respondents and about 28% of the flash model respondents felt the guidelines and expectations were clear. When asked about technical assistance, about half of the flash model respondents and 40% of the commercial product respondents found the technical assistance available for completion of the electronic portfolios to be helpful (see Table 6) with an additional 55% (commercial product) and about 41% (flash drive) finding the technical support somewhat helpful.

Statement: How clear were the portfolio expectations and guidelines?

Portfolio Type	Very Clear & Clear	Somewhat Clear	Not at All Clear
Paper (n=52)	48.1%	44.2%	7.7%
Commercial (n=20)	45%	35%	20%
Flash Model (n=58)	27.6%	46.6%	25.9%

Statement: Rate the technical support available to your for completing the portfolio requirements.

Portfolio Type	Very Helpful & Helpful	Somewhat Helpful	Not at All Helpful
Commercial (n=20)	40%	55%	5%
Flash Model (n=58)	48.3%	41.4%	10.3%

Table 6: Perceptions of the Portfolio Guidelines and Technical Support

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Analysis of the needed technology revealed that the majority of students engaged with an electronic portfolio format believed it was easy to learn the needed technology to complete the portfolio. Respondents of the commercial product reported higher perceptions on the ease of both learning and applying the needed technology to complete the portfolio. In fact, 65% of the commercial product respondents revealed it was easy to learn the technology and 90% believed it was easy to apply the technology. The flash model respondents had a similar perception of ease in learning the technology with 60% finding it easy to learn, but only 62% believed it was easy to apply the needed technology.

Statement: Rate the level of difficulty in LEARNING the needed technology to complete the portfolio requirements.

Portfolio Type	Very Easy & Easy	Very Difficult & Difficult
Commercial (n=20)	65%	35%
Flash Model (n=58)	60.4%	39.6%

Statement: Rate the level of difficulty in APPLYING the needed technology to complete the portfolio requirements.

Portfolio Type	Very Easy & Easy	Very Difficult & Difficult
Commercial (n=20)	90%	10%
Flash Model (n=58)	62.1%	37.9%

Table 7: Perceptions of the Use of Technology for Portfolio Development

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Regardless of the type of portfolio students were asked to create, the majority of participants completed the required portfolio to simply fulfill the expectations of the program. One student revealed, "I did not like the portfolio process because I didn't feel as if it represented who I am. As time went on, I felt as if I was just adding the required pieces" (personal communication, 2006). Many also assumed the paper portfolio to be a more organized and manageable task, simply because it was the format that had been utilized in the past. However, most of the electronic portfolio participants also acknowledged that the more experience they had with the portfolio, the easier and more beneficial it became. For example, one student stated:

I was really scared at first when I was told that our portfolio was electronic, or on the flash drive. After I started it and saw other people's portfolios as examples, it became easier. It is neat that instead of a printed copy of a PowerPoint presentation, one could just click and watch it on the flash drive. I think it is actually more fun to do because you get to do neat things on the computer. (personal communication, 2006)

In addition, several students liked the organization the electronic format offered, as well as the connections they could make to the education profession and their own personal theories and pedagogy. One student asserted:

I worked on it at least 3 nights a week since I understood exactly what was expected in the portfolio. I never really got frustrated with it because I tried to stay ahead and as I did the work for other classes, I would immediately place it into my portfolio. It really has not been an awful experience. It really made me focus on how professional I really wanted to be. (personal communication, 2006)

Furthermore:

I was able to create and put things that I was proud of in the portfolio. As I was being trained in other aspects of the education program, I took what I learned and it helped in making my portfolio so much more creative and more like me. (personal communication, 2006)

The greatest challenge associated with completing the electronic portfolio focused on the issue of communication. While some participants felt comfortable with the communication and support they received, several noted that clear expectations were not expressed in a consistent manner. One student acknowledged, "Communication was the biggest thing. It's hard to know exactly how to put your portfolio together when you have two or three different people

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telling you what to do. Other than that, it has been pleasant” (personal communication, 2006).

Conclusions and Recommendations

This study revealed several findings that led the researchers to make recommendations to the COEHS and to other comparable institutions considering making a transition from paper to electronic portfolios. The issue was not whether the COEHS should transition to an electronic portfolio format, but which electronic format would best address the needs of both the students and the College.

Clarity of Communication

First and foremost, the data revealed the need for the College to more clearly communicate the portfolio expectations and requirements to the students. Though rubrics, a website, and training were provided, students, regardless of the portfolio system used, articulated the need for more clarity. While the researchers certainly concur with this finding, the students’ perceptions were not unexpected. The paper portfolio system had been used over a period of years, and there was an understandable comfort due to familiarity with the expectations. Those participating in both electronic portfolio systems experienced several disruptive factors that may have influenced their perceptions (e.g., unfamiliar portfolio system, completely redesigned requirements and rubrics, inconsistent faculty messages, regular contact with students using the paper system). Regardless of these potential disruptive factors, the recommendation of the researchers remains the same. All persons involved in the portfolio development and assessment processes must clearly and consistently articulate the expectations and requirements. This will likely require additional training of faculty and students and the further development and enhancement of support systems, such as the COEHS ePortfolio website.

Technological Competence

Though students desired additional clarity in the overall expectations for the portfolio, they reported few difficulties in learning and using the required technology to develop their electronic portfolios. For the majority of students, the use of technology apparently did not hamper the development process. In particular, the students positively rated the technical support available to them. Considering the fact that the effective use of technology is a component of the state teaching standards, this finding indicates students are generally comfortable using technology to complete tasks such as the electronic portfolio. The researchers recommend additional examination of the students’ required

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technology courses to ensure alignment between the technology skills taught in the courses and the skills required to develop an electronic portfolio.

Faculty Feedback

Learner-centered teaching is a core value in the College. The decision to transition from a commercial product to the flash drive model was validated by the students' perceptions that they received a greater amount of faculty feedback when using the flash drive model compared to the commercial product. The researchers believe the reported increase in faculty feedback can be attributed to the flexibility and convenience of the flash drive model. Students carry their USB storage device with them when they are on campus attending classes. They can easily present their flash drive to a faculty member for immediate review, feedback, or assessment without the need for Internet access or special passwords. The increased level of faculty feedback clearly supports the mission of the university while meeting the needs of the students. Therefore, the researchers recommend continued use of the flash drive portfolio system as a means to accomplish both purposes.

Feelings of Professionalism

It was troubling to find that students' do not perceive the portfolio, regardless of type, as having a significant impact on their feelings of professionalism. The students' survey responses indicated a general lack of understanding of the professional purposes for developing a portfolio. The majority of students felt the portfolio had little impact on their classroom practice, and more than half reported little, if any, use for the portfolio during job interviews. This study also indicated that utilizing an electronic portfolio system did not seem to enhance the students' feelings of professionalism; however, one promising finding indicated that those students using the flash drive model reported a greater sense of control over the design of their portfolios and ownership of the final product. The researchers recommend the continued use and further development of a flexible electronic portfolio system, much like the flash drive model, in which students play a key role in the design, development, and content of their portfolios. By allowing the students greater control, the researchers believe the portfolios will more accurately reflect the individuality of the students and increase their ownership of the final product, and perceptions of professionalism will be enhanced.

In conclusion, electronic portfolios provide the means by which any student can document their accomplishments and easily share them with others. While this study was focused on the application of ePortfolios in preservice teacher preparation, students in other academic disciplines can benefit equally

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from the use and development of electronic portfolios. In the Arts, students can include performance video, audio, and graphical examples of their work. Students in Sciences will benefit from the ability to link to video and audio-based artifacts as well as software-generated evidence of their accomplishments. A broad spectrum of digital representations, complex graphics, animations, and digital creations can now be brought together in a single electronic source.

By improving the portfolio development process, the portfolio will become a more valuable, integral part of the students' professional development, and the product will be one that is sustainable throughout their professional careers. The future of the electronic portfolio as a tool for documenting accomplishments continues to evolve. The ePortfolio of the future may someday be a personal, interactive repository, or web presence to which all students contribute on a continual basis, perhaps for a lifetime.

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