

A Capstone Experience for Preservice Teachers: Building a Web-Based Portfolio

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ABSTRACT

This study presents the results of the examination of the use of technology to enhance the capstone portfolio process for teacher candidates completing a master's degree at a small regional campus in Northwest Ohio, United States. Students at this institution complete a fifth year program that results in a master's degree and a recommendation for an Early or Middle Childhood license. The study focuses on determining the effectiveness of using a web-based portfolio. Teacher candidates' perceived knowledge, skills and dispositions about technology literacy and usage in developing an e-portfolio are measured by comparing a pre and post survey. Results indicate a stronger knowledge and skill base concerning technology use and state standards, as well as a better disposition towards utilizing technology for creating and maintaining portfolios.

Keywords

E-portfolio, web-based portfolio, technology, teacher preparation

Technology That Improves Teaching and Learning

Technology use in higher education has increased as instructors see the opportunity to increase the effectiveness of subject matter delivery along with increased flexibility for teacher candidates and instructors (Blicblau, 2006). Technology can be an effective tool to help the learner more fully understand the target knowledge, and develop higher order thinking skills and problem solving strategies (Fletcher, 2001; Jonassen, 2001). Recent technologies such as Google docs and the concept of Web 2.0 can help to facilitate greater communication of candidates' skills and talents (Henke, 2007; McPherson, 2007). The integration of technology specific to teacher preparation has also expanded in recent years (Alexander & Golja, 2007; Wilhelm & Confrey, 2005). Expertise and use of technology by instructors at the higher education level has improved with university wide support (Herner, Karayan, Love, & McKean, 2003). This has set the stage for ever more effective uses of technology, specifically web-based tools.

The Use of Web-based Portfolios

The use of electronic portfolios (particularly web-based) for teacher preparation is recent, but they do build on the foundation of traditional paper portfolios. Portfolios generally include a resume, philosophy of education, references, letters of recommendation, reflections on educational theories, personal goals, examples of lesson plans, and unit plans (Aschermann, 1999; Chappell & Schermerhorn, 1999; Ryan, Cole & Mathies, 1997; Wiedmer, 1998). The definitions of portfolios are numerous. They have been defined as a purposeful collection of student work assembled to demonstrate progress and achievement (Barrett, 1999; Bull, Montgomery, Overton & Kimball, 1999; Herman & Morrell, 1999; Tuttle, 1997; Wilcox, 1997). Others believe that portfolios offer the opportunity for multidimensional assessment (Backer, 1997; Cole, Tomlin, Ryan & Sutton, 1999; Jacobsen & Mueller, 1998; Riggsby, 1995). They also may be used to enhance teacher preparation course instruction (Corbett-Perez & Dorman, 1999; Mohnsen, 1997; Purves, 1996; Watkins, 1996). Portfolio creation involves the participant in active learning activities such as problem solving, writing, analyzing and researching (MacDonald, Liu, Lowell, Tsai, & Lohr, 2004). Electronic portfolios also have the possibility to create a program that is more highly visible, with a web presence that aids in student recruitment (Reardon, Lumsden, & Meyer, 2005).

Web-based Portfolios in Teacher Education

Portfolio content that is stored in a web-based course management database, such as WebCT™, Blackboard™ (In February 2006 WebCT and Blackboard merged) or Desire2Learn™, may be presented to the reader in a variety of formats depending on purpose (Banister, Vannatta, & Ross, 2006). To borrow terminology from the information systems discipline, the user can have a view of the data that fits the user's particular need (Herner, Karayan, Love, &

McKean, 2003). Instructors will see artifacts created by a teacher candidate as the program progresses and use them to help form the candidate's development. If the portfolio is maintained in one location throughout the course of studies a final committee reviewing a teacher candidate's mastery of standards as the candidate nears graduation may see cumulative and summative artifacts and a final reflection created by the candidate. Teacher candidates can create a matrix (see Figure 1) that will assist those responsible for accreditation reporting to see specific course assignments and candidate artifacts produced in response to the assignments that address each standard. As a result, sequencing of assignments and curriculum content to develop the candidate's mastery of the standard can be evaluated. This is especially important as teacher education becomes more student-centered, and accrediting bodies look for specific evidence of growth (Chambers & Wickersham, 2007). The reasons for using a web-based versus a paper portfolio are numerous. The ease of access for numerous reviewers, the ability to provide graphics and weblinks, as well as learning to model authentic evidence of student progress using this global medium are useful, but one of the most important reasons to use the web-based technology is to learn to problem solve in our technologically driven world (Sanders, 2000).

Portfolio Artifacts	Standard I (Domain A)							Standard II (Domain B)					
	I-1	I-2	I-3	I-4	I-5	I-6	I-7	II-1	II-2	II-3	II-4	II-5	II-6
July		!		X		!						X	
FISH!													
August		!				X	!						X
Diversity/Exceptionality													
September								X	X				
Courage to Teach													
October	!	X					X			X			
Pedagogy Survey													
November	!	!		X		!						X	
Autumn Leaves													
December		!											!
Midterm													
January	!	!	!	!	!					!		!	
Project Wild													
February		!	!			!							
Problem-Posing													
Lesson													
March	!	!								!			
Opportunity Cost													
April			X	!		!							
Ant Story													
May	!	!	!		X			!					!
Inventions													

X Standard Best met

! Standard met

Figure 1: Sample Matrix

Advancing the Portfolio Process Through the Use of Carmen

A small regional campus in Ohio, United States, has a five year program for general education teacher preparation that results in a master's degree and recommendation for an Early (grades Kindergarten- 3rd grade) or Middle Childhood (grades 4th-9th) license certification. During the year of graduate studies teacher candidates participate in a year long series of Capstone seminars culminating in a final portfolio presentation. This study sought to compare the beginning knowledge, skills and dispositions of a group of teacher candidates that used a technology based system for Capstone work, as well as portfolio artifact gathering, with their perceived knowledge, skills and dispositions at the end of the program. Carmen (the name the university gives to their version of Desire2Learn™)

served as the structured technology tool. One of the major goals of technology use was to better mentor master's students through their graduate work, so that upon completion of the program they show a stronger positive disposition towards using technology and reflecting on their teaching skills, as well as a stronger knowledge base concerning technology skills and state standards.

Comparing Carmen to Other Systems

Carmen is a Desire2Learn™ (<http://www.desire2learn.com>) product. The instructors have used it for course delivery and storage of information. It is a flexible system that allows for data to be stored throughout the course of the Capstone experience, which lasts one calendar year. It is then available to the teacher candidates for 30 weeks after the end of the course. The collaboration tools it features are discussion boards, group discussion areas, dropboxes and lockers (storage space for group projects). Carmen (<http://telr.osu.edu/carmen/>) compares well to similar products, such as Blackboard™. Blackboard™ (<http://www.blackboard.com/us/index.Bb>) allows the user to share files as well as create an e-portfolio with extra software. This system incorporates many of the same functions of Carmen. They both allow for threaded discussions, which can be assigned a grade. In terms of sharing files, Carmen allows easier sharing of files among peers. Both systems include internal email, but Carmen also adds options such as internal course mail only. Both systems allow for real time chat rooms, calendars, working offline and searching within the course. Teacher candidates can also work in groups with their own chatroom and discussion forum. Carmen also offers groups their own dropboxes and lockers. The Desire2Learn™ product was chosen because of its functionality for the university as a whole. The team that compared the course management systems felt that Desire2Learn™ was a more robust system and had an easier to learn format for faculty and staff.

Method

The participants in this study were 41 graduate students, 34 females and 7 males. The group was almost evenly split between those seeking Early Childhood certification (21) and those seeking Middle Childhood certification (20). The instructors of the Capstone seminar created a handbook based on the mission of the College of Education and Human Ecology, the Interstate New Teacher Assessment and Support Consortium (INTASC), the criteria of the National Council for Accreditation of Teacher Education (NCATE), and the standards of the Ohio State License. This handbook included guidelines and scoring rubrics, which were transferred to Carmen.

Instructors have the ability to post documents, video clips, and internet addresses into Carmen for teacher candidates to utilize. There are also discussion rooms and places for work to be uploaded. The instructors of Capstone used Carmen to collect student entries and record comments about teacher candidate work. Carmen also served as a place to post announcements for teacher candidates and for them to look at a personal grade book that kept track of their grades for each assignment throughout the year.

The instructors collected data of teacher candidates' knowledge, skills and dispositions by reviewing their monthly artifacts and reflections, as well as conducting pre and post surveys. The participants posted an artifact and a reflection paper by the end of each month for one year. By analyzing types of artifacts and ways of posting the artifacts and reflections, the instructors measured the level of knowledge and skills regarding the Carmen system, Microsoft office products, and in most cases, effective use of a scanner and a digital camera. Reading the reflections indicated the level of comfort with state standards. Teacher candidates were required to choose an artifact from their course or field work and reflect on how this artifact advanced their knowledge level regarding teaching standards. The instructors also reviewed the final reflection paper that showed the teacher candidates' growth in teaching philosophy and understanding of teaching and learning.

This group was also surveyed about the Capstone process in the beginning and at the end of the program. These surveys (see Figure 2) were given electronically by using Flashlight™ (http://ctlsilhouette.ctlt.wsu.edu/ctlsilhouette2_5/), and the results were recorded in a spreadsheet. The survey data were analyzed by the instructors and two graduate assistants.

The purpose of this survey was to indicate teacher candidates' perceived level of knowledge concerning the use of an online course site (Carmen) and the use of a cumulative portfolio project for students in the Master of Education

program at The Ohio State University at Lima and it refers to the objectives from the following EDU T & L capstone course. Teacher candidates were asked to mark only one answer and rate their perceived current knowledge in five levels; 0= No knowledge, 1= Little knowledge, 2=Partial knowledge, 3=Sufficient knowledge, and 4=Full/complete knowledge to achieve understanding. In order to save space, we present only survey questions not the original survey, which was in a table format.

1. How much knowledge do you have about portfolio assessment?
2. How familiar are you with Carmen?
3. How familiar are you with online discussions?
4. How familiar are you with posting assignments online?
5. Understanding the content being taught as addressed in content standards for the various disciplines.
6. Becoming familiar with relevant aspects of all students' background knowledge and experiences.
7. Articulating clear learning goals that are appropriate for the students.
8. Demonstrating an understanding of the connections between the content that was learned previously, the current content, and the content that remains to be learned in the future.
9. Understanding and utilizing appropriate educational technology to support student learning in various content areas.
10. Creating or selecting a wide variety of teaching methods, learning activities, and instructional materials or other resources that are appropriate for the students and that are aligned with the goals of the lesson.
11. Creating or selecting evaluation and assessment strategies that are authentic, appropriate for the students and that area aligned with the goals of the lesson.
12. Creating a climate that promotes fairness.
13. Establishing and maintaining rapport with students.
14. Communicating challenging learning expectations to each student.
15. Establishing and maintaining consistent standards of classroom behavior.
16. Making the physical environment as safe and conducive to learning as possible.
17. Including demonstration and use of appropriate safety procedures and adherence to safety rules.
18. Considering and sensitively addressing the needs of diverse learners, including diversity in academic abilities, physical abilities, culture, race, gender, socioeconomic status and sexual orientation.
19. Making learning goals and instructional procedures clear to students.
20. Making content comprehensible to students.
21. Encouraging students to extend their thinking.
22. Integrating learning across subject areas.
23. Integrating technology and information literacy.
24. Connecting learning to real life experiences.
25. Monitoring students' understanding of content through a variety of means, providing feedback to students to assist learning, and adjusting learning activities as the situation demands.
26. Using instructional time effectively.
27. Providing culturally responsive teaching for all students.
28. Reflecting on the extent to which the learning goals were met.
29. Demonstrating a sense of personal and professional efficacy.
30. Building professional relationships with colleagues to share teaching insights and to coordinate learning activities for students.
31. Communicating with parents or guardians about student learning.
32. Contributing to the community through community service.
33. Extending your professional knowledge through professional development activities.
34. Demonstrating a commitment to personal life long learning.

We also asked teacher candidates to describe their experiences with technology and web-based portfolio.

35. Did you ever seek assistance with the portfolio process this year? (yes, or no)
36. If you did seek assistance for questions regarding Capstone and the portfolio process how did you seek help?
37. If you sought assistance this year, in what area did you need help?
38. What are the benefits of using Carmen to you as a learner?
39. What are the difficulties for you as a learner when course participation in Carmen is required?
40. What is your idea of participating in online discussions and activities?
41. In what ways is the Portfolio process influencing your growth as a teacher?
42. How prepared do you feel to teach students with diverse learning needs? Why or why not?

- | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 43. How prepared do you feel to teach students in an urban setting? Why or why not?
44. At the end of the process were your expectations for your Capstone portfolio met? Why or why not?
45. How would you describe your experience in the field?
46. Please discuss strengths and weaknesses of the Master's program. |
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Figure 2. Capstone Seminar Survey

Results: Consequences of Using Carmen

The instructors' goals were to determine the effectiveness of using a web-based course management/portfolio tool for master's students during the Capstone experience. Reviewing reflection papers and measuring the pre and post surveys of candidates' perceived knowledge, skills and dispositions gave the instructors a strong indication if the candidates had achieved better knowledge of technology usage and state standards. The final goal was to increase the candidates' willingness to utilize technology in their teaching as well as for creating portfolios with their own students in future teaching placements. Teacher candidates were specifically asked about the benefits and difficulties of using the Carmen system (see Figure 2) and similar comments are paraphrased and grouped in each section.

Participating in online discussions and activities

In the beginning, preservice teachers' attitudes toward the web-based portfolio were evenly divided, positive and negative. Some examples of positive comments were

I have never participated in online discussions, but I feel it is necessary to learn.

I think it sounds like a great idea, but I've never done it before.

Some examples of negative comments were

I don't like online discussions. It is easier to accomplish in person. The time we had an online discussion was very distracting with other conversations and late ideas posted that were irrelevant to the subject matter being discussed.

These discussions are typically very stale and do not provide the same depth of benefit/learning that occurs within a class.

Or, some tried to define what online discussions and activities are:

Blogging, submitting questions/answers, getting others ideas, plans, resources, etc...

By the end of the program, their comments concerning participating in online discussions and activities had changed to predominately positive. One student indicated that it is "similar to talking on the phone, but being able to discuss things with more than one other person." Another student noted that she "gained knowledge through technological advances-videos online." However, some teacher candidates still preferred in person discussions.

Knowledge and skills of using instructional technology

Teacher candidates who used Carmen report greater skill in using tools such as PowerPoint and Microsoft Word, after being required to use these tools in Capstone. Figure 3 depicts preservice teachers' perceived knowledge and skills of using educational technology that supports student learning, as well as integrating technology and information literacy: thirty-three percent in the pre and two percent in the post surveys reported having no (NK) or little knowledge and skills (LK); 45% percent in pre and 87% in the post survey rated themselves as having sufficient (SK) or full knowledge and skills (FK). In summary, teacher candidates were more satisfied that they had created a more comprehensive portfolio that showed their growth as a teacher in terms of knowledge and instructional skills.

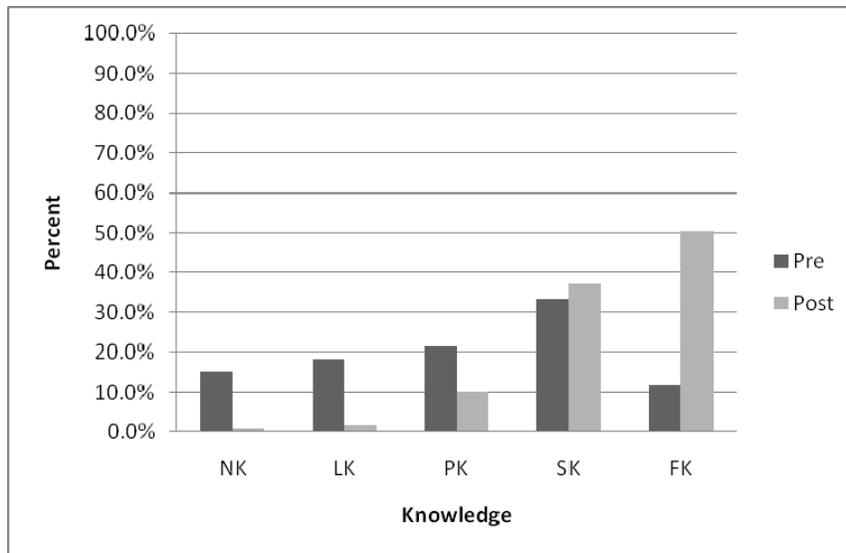


Figure 3. Knowledge and Skills of Instructional Technology

Knowledge and skills of developing web-based portfolio

Teacher candidates were asked to rate their familiarity with and technological skills for using the on-line tool, Carmen. As can be seen in Figure 4, more than half of preservice teachers already reported having sufficient or full knowledge and skills for using Carmen in the beginning of the program. After completing the web-based portfolio, 85% of preservice teachers reported that they have sufficient or full knowledge and skills for using Carmen, online discussions, and posting assignments online.

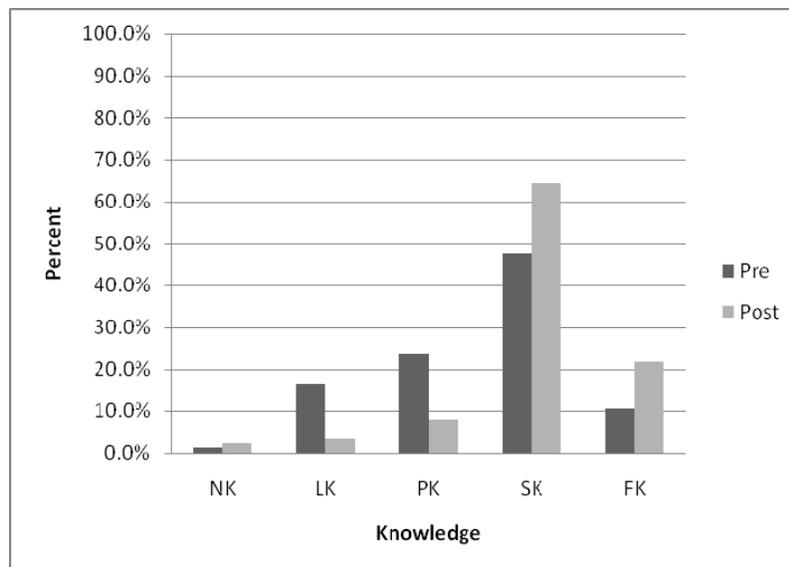


Figure 4. Web-based Portfolio Familiarity

Challenges of using a Web-based portfolio

Despite the increasing knowledge and skills with technology, technical difficulties such as problems with their personal computers, Carmen being down, or accessibility from home are reported by preservice teachers throughout the program. These sample comments were typical of the participants:

I liked the assignment submission and online discussion posting because they are not things that I will always use or have used so I am more comfortable with using them. Sometimes I do not like to use things I am not comfortable, but now I am more likely to use them.

It is difficult if your home computer does not allow you to use certain applications such as videos.

Access to another computer when having trouble with ours at home, and wanting to get on Carmen and unable to when Carmen or the university website was down.

The issues preservice teachers reported in the beginning are possibly due to the lack of experience with on-line courses. They may also be habituated in the face-to-face education context. They strongly believe in personal interactions or direct guidance. Some comments made by preservice teachers are as follows:

Simply getting used to using the program.

If you have questions regarding the assignment the response takes awhile, plus sometimes it is easier to understand things in person.

No one to ask questions directly to.

The best instruction still comes through face to face, teacher directed classes.

Not knowing if my assignment was received.

Sometimes postings didn't work right or the assignments didn't always show up. Stuff would upload incorrectly.

I would email a professor to ask about an assignment, but couldn't understand their explanation; Not understanding directions.

By the end of the program, the issue of not having regular face-to-face contacts is still brought up by three teacher candidates. However, most preservice teachers seem to accept the fact that it is a web-based portfolio. The reported difficulties are more technical and practical based on what they experienced.

Access to another computer when having trouble with ours at home, and wanting to get on Carmen and unable to when Carmen or OSU website was down.

It takes a long time for me to upload some artifacts.

Paper.. People may have had a hard time not having all the materials in hand.

I would procrastinate because I knew the deadline could be met at night, so I could work on the activity at home. This did not help me organize.

I don't have a nice portfolio in hand to keep, instead it is online or on CD. I couldn't really use it to take to interviews.

Benefits of using Web-based portfolio

In the beginning of the program, the majority of preservice teachers saw the course tools as convenient, an easy way to get information, and as a good communication tool. They used these tools to get class information, check and submit assignments, and check grades. By the end of the program, they listed Carmen's organizational function as the most beneficial. These features are easily viewed from the course homepage (see Figure 4). Students will see messages from the instructors and an indicator on the left side that shows if there are any discussion messages to read. When they click on Content they will find information about the course, including the handbook, assignments, and examples of acceptable entries. When teacher candidates click on Discussions they will have the opportunity to view different forums on topics concerning their portfolio. When Dropbox is selected teacher candidates can load

their monthly reflections or assignments. The final tab is Grades, and this allows teacher candidates to see the grade item, points and grade assigned by the instructor. Other benefits of having the web-based portfolio reported by preservice teachers are summarized below:

Being able to talk to numerous people

Gaining knowledge from others

Improved understanding of the uses for posting and uploading information/questions

Liked doing discussions.

Not having to drive to campus to turn in an assignment.

It is helpful to become more knowledgeable about how technology can be helpful and useful.

Could always find answers to questions by searching through Carmen

Saved paper

Easy to post assignments by the due date and understand what the criteria is

Using Carmen was an easy way to communicate with the instructors

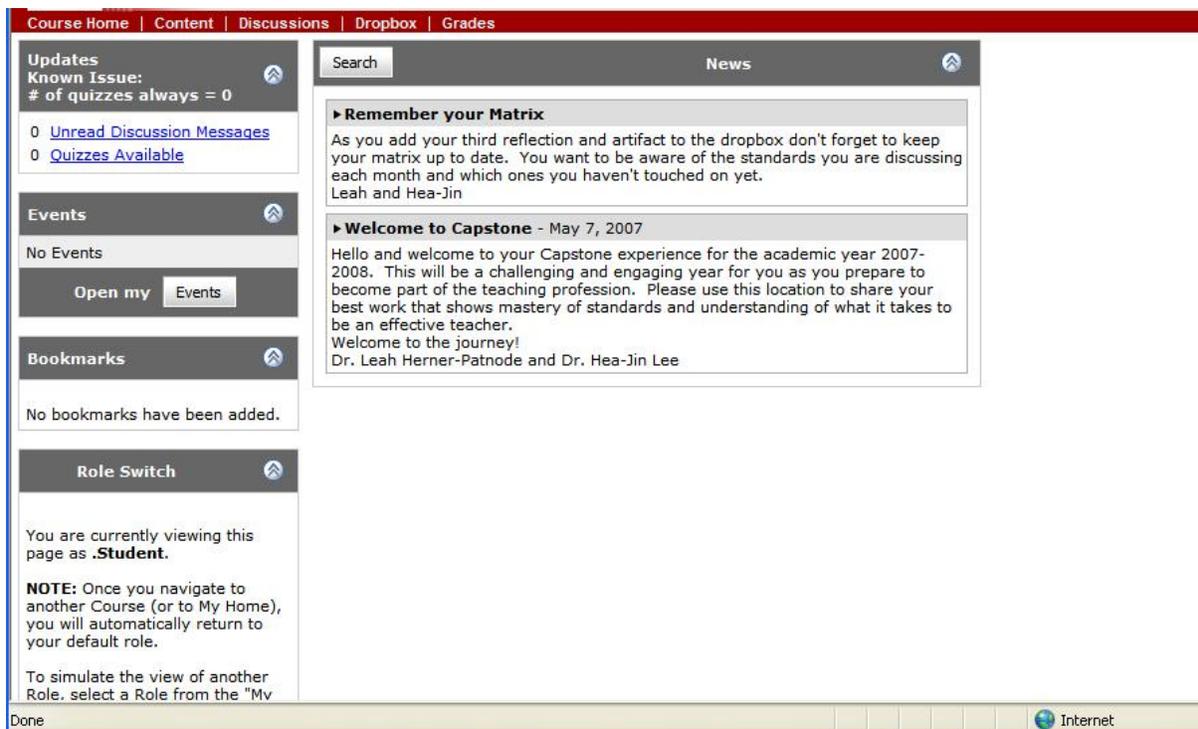


Figure 5. Screenshot of Capstone Homepage

Discussion and Implications

The goal of this study was to determine the effectiveness of using a web-based portfolio with Master's students during their Capstone experience. The instructors were hoping that the increased flexibility in course delivery coupled with frequent use of technology would result in stronger knowledge, skills and dispositions for these preservice teachers. Posting an artifact and a reflection paper each month helped the teacher candidates get familiar

with Carmen and practice using technology. The monthly selection and reflection process also helped them view their learning process not as a group of independent subjects but as an aligned whole.

Results indicate that a better grasp of technology is needed, which the instructors will continue to work on. More skill training on using scanners and making Microsoft Office products available to everyone are important issues for future Capstone seminars. Incorporating the use of recent technologies such as Google Docs and discussions about Web 2.0 would be beneficial. The instructors might use Google Docs, a free word processing and spreadsheet site (<http://docs.google.com>) to link teacher candidates to their documents, and those of their peers, for longer than the calendar year that they are currently available. Google Docs could be very useful for encouraging collaboration throughout the course of study, and it can be easily used in conjunction with the existing Carmen course. Web 2.0 is a bigger concept and involves things such as blogs or wikis. Ways in which using technology to read and write are shared through the World Wide Web. The reason the instructors chose to use Carmen was driven by university policy. The instructors do find Carmen slightly easier to use than WebCT™ or Blackboard™, but similar results may be possible for other instructors using these course delivery systems. A pre and post survey of instructors' knowledge, skills and dispositions regarding use of the web-based portfolio would also be worthy of future investigation. In addition, content analyses of teacher candidates' reflection would provide teacher educators with insightful suggestions of using a web-based portfolio.

Conclusion

Some Capstone teacher candidates discussed technology use in their teaching placements, but no overt attempt to educate the M.Ed's about these new technologies took place. This will be important for further technological gains in future classes. The more up to date and pertinent the information, the stronger the possibility to positively affect dispositions will be. Dispositions are hardest to affect, because it takes a long time and frequent exposure to influence attitudes and beliefs. Therefore, the portfolio development process was spread evenly throughout the program. The instructors were pleased with the improved level of reflection about practice, but see a need for further discussion about how the reflection process should work, and a more clear definition of reflection should be made available in the handbook, as well as verbally discussed. The instructors also see a need to make sure each teacher candidate leaves the program with a CD-ROM of the portfolio work they uploaded on Carmen. Teacher candidates were not required to create a paper portfolio, so this CD will give them something to review as they look for employment and reference as they begin their teaching profession. The technology based portfolio project was rated as successful by instructors and participants. As technology use in higher education increases the need for technology training for both teacher educators and preservice teachers will continue. The web-based portfolio is one tool to affect a positive change in preservice teachers' knowledge, skills and dispositions towards teaching and technology.

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