A STUDY TO UNDERSTAND PRESERVICE TEACHERS’ LEARNING EXPERIENCES WHILE DEVELOPING ELECTRONIC PORTFOLIO IN A TEACHER EDUCATION PROGRAM

DISSENTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Shwu-Meei Chen, M.A.

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Dissertation Committee:

Dr. Marilyn Johnston, Adviser
Dr. Richard Voithofer, Co-Adviser
Dr. Rebecca Kantor

Approved by

Adviser
Co-Adviser
College of Education
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ABSTRACT

Recently, many teacher education programs have implemented electronic portfolios in order to develop preservice teachers’ technology competency and promote reflectivity. This study looked at the use of electronic portfolios in a year-long teacher education program considering how they were used and what the students learned. The participants were a cohort of M.Ed. students involved in a year-long teacher education program. The study explored the preservice teachers’ perceptions of developing electronic portfolios and then whether their learning about e-portfolios was integrated into their subsequent teaching.

This study used sociocultural theory as framework to understand: 1) What were these preservice teachers’ perception of learning about the e-portfolio? 2) How did sociocultural context influence these preservice teachers’ learning from the e-portfolio? 3) What did these preservice teachers learn from developing their e-portfolios that influenced their technology competency? 4) How was the learning experience from the e-portfolio transformed into their first year teaching? The study drew on a qualitative paradigm using multiple research methods including surveys, interviews, observations, and document analysis.
Analysis of the data showed that the preservice teachers perceived the learning from developing their e-portfolio as both a process and a product for learning technology, which involved reflection and documentation as well as sharing their learning. The sociocultural context including peers, mentor teachers, the M.Ed. program and the school contexts had significant influence on these preservice teachers’ learning. The study revealed that these preservice teachers increased their learning about technology knowledge and skills. There was also evidence that some of these preservice teachers transformed their learning from the e-portfolio into their future teaching.

This study identified the complexity of the learning process that teacher educators have to recognize in order to engage and arrange teacher learning through e-portfolios in a meaningful way. There were strengthens as well as weaknesses in this particular teacher education program related to the implementation of the e-portfolio. As such, this study contributes to the literature on using e-portfolios to enhance learning, reflection, and professional growth for preservice and beginning teachers. Recommendations for further research are provided.
I like to dedicate this study to
My family who brings me joy and love
&
My advisor who enlightened my world
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VITA

September 08, 1961. . . . . . . . . . . . . . . . . . . . . . Born – Taichung, Taiwan

1977 – 1982. . . . . . . . . . . . . . . . . . . . . . . . . . . . . Diploma
The Junior College of National Taichung
Teacher College

1983 – 1987. . . . . . . . . . . . . . . . . . . . . . . . . . . . . B.A. Chinese Literature
Providence University, Taiwan

2000 – 2001. . . . . . . . . . . . . . . . . . . . . . . . . . . . . M.A. Integrated Teaching & Learning
The Ohio State University

2002 – current . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tech Assistant, Graduate Associate,
The Ohio State University

PUBLICATIONS

   ECC/MED program prepared to be multiculturally competent? Paper presented at
   the annual meeting of the American Educational Research Association
   Conference, Chicago, IL

   reflecting on our learning and practice on issues of diversity and equity. Paper
   presented at the annual meeting of the American Educational Research
   Association Conference, Montreal, Canada.

FIELDS OF STUDY

Major Field: Education
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CHAPTER 1

INTRODUCTION

1.1. Background of the study

Technology has created a new environment for living in the twenty-first century. This so-called high technology era affects and changes both social structures and knowledge construction. Our ways of thinking and acquiring knowledge have also been influenced by digitalization. The way we live, learn, and work has changed rapidly. That is, technology has reshaped our social lives as well as education.

The report of the U.S. Department of Education shows that there was one computer for every five public school students in 2000; and 95 percent of K-12 classrooms had Internet connectivity (Mouza, 2003). Information technology has created a new and powerful tool for teaching and learning. Therefore, to prepare our children to live in a digital world in the future, it is necessary for teachers to learn how to implement technologies into their teaching to enhance students’ learning.

Most of current teachers, however, were not prepared in their teacher education programs to integrate technology into teaching (Darling-Hammond, Chung, & Frelow, 2002; Drazdowski, Holodick, & Scappaticci, 1998; Duhaney, 2001; Pellegrino & Altman, 1997; Willis & Mehlinger, 1996). As the report of the National Center for Education Statistics showed, only 20% of teachers reported that they felt “very well
prepared” to integrate technology into classroom activities (Duhaney, 2001). Teacher education programs have been criticized for not preparing future teachers to teach with technology across the curriculum.

The current situation is to require preservice teachers to develop technology competency in teacher education as part of the accreditation process. To study the impact of this, a number of researchers have begun to study the effects of integrating technology into teacher education curriculum currently in America (Willis & Mehlinger, 1996, Britten, Mullen, & Stuve, 2003; Georgi & Crowe, 1998; McKinney, 1998; Montgomery, 2003). In addition, NCATE (http://www.ncate.org/documents/unit_stnds_2002.pdf), ISTE (http://cnets.iste.org/teachers/t_stands.html), and many state’s professional standards boards have placed technology integration in their standards. Teacher education programs have begun to pay attention to developing preservice teacher’s technology proficiency.

1.2 Statement of the problem

Recently, many researchers have drawn on the implementation of electronic portfolios (e-portfolio) in teacher education programs as a way of preparing preservice teachers’ competency of technology (Adcock, 2003; Barrett, 2003a; Costantino & De Lorenzo, 2002; Montgomery, 2003; Lynch, 2004). The literature in this area describes what electronic portfolios (e-portfolios) are, how e-portfolios are used, and why e-portfolios are used in teacher education. However, there is little research to discuss preservice teachers’ perception of developing e-portfolios, what they learn by doing e-portfolios, and whether preservice teachers’ learning about e-portfolios is integrated into their future teaching (Barrett & Knezek, 2003; Berg & Lind, 2003).
Starting in 2002, the Early Childhood Master of Education program (M.Ed.) at The Ohio State University (OSU) College of Education required every early childhood (Pre-K-grade 3) M.Ed. students to develop an e-portfolio for their capstone project at the completion of the program. I was one of two technology assistants participating in this project. During the first year, as I worked with the 2002-03 cohorts of preservice teachers, I observed the process of their learning about the e-portfolio, which was filled with enjoyment, struggles, tension, and conflicts. It helped me understand the complications of learning during the e-portfolio process. I began to ask questions: What was preservice teachers’ perception of e-portfolios? From the preservice teachers’ point of view, what were the strengths of doing the e-portfolios? What were their concerns about developing the e-portfolios? Did preservice teachers have a better understanding and skills of technology integration through developing their e-portfolio? How could teacher education programs (or I) provide guidance and support in helping the preservice teachers? During the 2003 academic year, I conducted this dissertation study with more focused questions and systematic data collection.

1.3 Purpose of the research and research questions

The purpose of this study was to explore the 2003-04 year preservice teachers’ learning about the e-portfolio within an early childhood M.Ed. certification program at The Ohio State University. It aimed to provide insight into the implementation of e-portfolios in teacher education programs. In particular, the study endeavored to understand preservice teachers’ learning from sociocultural perspectives and interpret their learning about the e-portfolio as sociocultural activities.
As I believe teaching is a profession, preservice teacher learning to teach is not to acquire specific, permanent skills, but rather their learning process is situated within a sociocultural context. Learning, from sociocultural perspectives (Dewey, 1949; Vygotsky, 1978, Lave & Wenger 1991; Rogoff, 1995; Wenger, 1998), is experience within which learners participate. It is social interaction with others and the environment. Every experience is a moving force that can lead to learner change and development for further learning. My study uses sociocultural theory as the framework to explore preservice teachers’ perception and experience of developing electronic portfolios.

This study describes the preservice teachers’ perception of e-portfolios based on their learning experiences while developing e-portfolios in the teacher education program. The engagement of preservice teachers’ learning activities related to developing electronic portfolios in the teacher education program is described. How preservice teachers changed and grew in professional competency is explored. To gain insight into implementing electronic portfolio in teacher education successfully, preservice teachers’ concerns and suggestions are provided. Furthermore, the study assessed the benefits and challenges of developing e-portfolios extended into their classroom teaching.

The four research questions for this study were:

1. What were the preservice teachers’ perceptions of learning about the e-portfolio?
2. How did the sociocultural contexts influence preservice teachers’ e-portfolio development?
3. What did the preservice teachers learn from developing their e-portfolios that influenced their technology competency?
4. How did program graduates transform their learning from developing their e-portfolios into their first year of teaching?

1.4 The methodology

To answer these research questions, this study drew on a qualitative paradigm. Multiple methods were used including observation, survey, interviews, and document analysis to describe the sociocultural context of preservice teachers’ learning experience and perceptions of electronic portfolios. The main research setting of this study was a one-year long (five quarters) graduate level Early Childhood teacher licensure program (M.Ed.) at The Ohio State University. As one of two technology assistants, I observed and participated with the M.Ed. students in developing their e-portfolio during the 2003-04 school year. In the 2004 summer quarter, as M.Ed. students were finishing their e-portfolios, a survey questionnaire was handed out to 47 students to collect students’ perspectives on values, challenges, and suggestions about developing e-portfolios in teacher education.

To more fully and deeply understand how preservice teachers constructed and perceived the development of their electronic portfolios, thirty-minute face to face individual interviews were conducted with 17 volunteer preservice teachers and nine faculty members who taught in the M.Ed. program. The preservice students’ electronic portfolios were analyzed during the data analysis process. This provided evidence about the preservice teachers’ technology competency and professional development. The content of electronic portfolios was compared with survey and interview responses to triangulate the data analyses.
In order to investigate whether the preservice teachers transformed their learning from the e-portfolio into their first year class teaching, the last phase of the research was a follow-up study with six first year teachers three months into their first year teaching. These case study teachers had all been interviewed at the end of the program.

1.5 Significance of the study

This study contributes to both theory and practice related to preservice teachers’ learning from developing the e-portfolio in teacher education. As there is little research in this area, this study offers a case of a group of preservice teachers’ learning. The findings illustrate ways in which the process and product of the e-portfolio were two important aspects in both the teacher education programs and Pre-K-3 schools. The study provides a better understanding of the potential uses of an e-portfolio project in teacher education programs than has been described in the literature to date.

This study found evidence that the social context had a significant influence on the learning process of these preservice teachers. The students’ learning process was filled with tension and conflicts. This study discussed how the program faculty and program structure influenced the preservice students’ learning and engaged them in a community practice. It also described the ways in which students faced challenges and where the program did not provide the support that the preservice teachers wanted. As teacher education programs plan to implement an e-portfolios project, this study can provide practical suggestions about how to build mutual engagement among faculty, preservice teachers, and schools.

This study also provides a future vision of e-portfolios in teacher education. The e-portfolio is a cultural tool that can mediate preservice teachers’ learning about teaching.
E-portfolios can be used to connect students’ learning in content areas and field placements, it can join students together as they construct their reflections, and it can provide a way for preservice teachers to integrate their learning across time throughout the teacher education program. The e-portfolio can be a valuable learning tool in teacher education programs, but teacher educators have to plan appropriately, develop a community of learning, and support students’ technology skill development, their reflections on their learning, and the process overtime that leads to the development of their portfolio.

1.6 Overview chapters

Chapter one is an introduction of the background, research problems, and focus of this study. It also gives a brief overview of the theoretical framework and the methodology for this study. Finally, it describes the significance of this study in both theoretical and practical aspects.

Chapter two addresses the theoretical framework. First, sociocultural theory is used as the conceptual framework for this research to understand the nature of preservice teacher’s learning experience. Second, teacher learning in the sociocultural context is examined. Third, recent research related to how e-portfolios are used in teacher education is described.

Chapter three describes the research methodology, introduces the researcher role, describes the research design and method of data collection, and explains the data analysis. In addition, how trustworthiness was established for this study is discussed.

Chapter four presents the data analysis. It provides the research context and analysis of the survey, interviews, and the observation notes in relation to the three
research questions: the preservice teachers’ perception of e-portfolio, the influences of sociocultural contexts on preservice teachers’ learning about e-portfolios, and the preservice teachers’ development of learning from the e-portfolio process. In addition, how six program graduates integrated their learning about developing e-portfolio into their first year teaching practice is discussed.

Chapter five is the review and discussion of this study’s major findings, including my understandings of the preservice teachers’ learning from the e-portfolio process and how their learning of e-portfolio was transferred, or not transferred, to the classroom. Suggestions for teacher education program for future implementing of the e-portfolio project and the need for future research are also provided.
CHAPTER 2

THE LITERATURE REVIEW

In this section, I first review sociocultural theory as the conceptual framework for understanding the nature of preservice teacher’s learning experiences. Dewey, Vygotsky, Lave, Wegner, and Rogoff’s theories are explored to frame the preservice teachers’ learning as a community practice, attending to interpersonal interaction, and personal development on three planes. From this theoretical framework, learning is described as a sociocultural activity; I discuss learning as a mediated action and explain how cultural tools are integral to the learning context. Second, I situate the teacher education program within a sociocultural context and emphasize the preservice teachers’ learning about teaching as professional development. In order to continue to grow from everyday teaching experiences, preservice teachers need to develop reflective thinking as an important aspect of their professional growth. In addition, I argue that the electronic portfolio (e-portfolio) is a cultural tool that can promote reflective thinking in teacher education programs. Third, I summarize how electronic portfolios have been used to support preservice teachers’ learning in teacher education covering the extant literatures of what, why, and how electronic portfolios have been used in teacher education programs.

2.1 Learning in sociocultural theory
This research drew on sociocultural theory to understand preservice teachers’ learning experiences within a particular teacher education program. A sociocultural theory emphasizes human events and activities which cannot be viewed as individual because they do not happen in isolation or in separate environments. Individuals cannot be separated from the world in which they live where events/activities happen. Learning is not an isolated action but a community of practice (Rogoff, Baker-Sennett, Lacasa, Goldsmith 1995). To discuss the learning investigated for this study, the preservice teachers’ learning is situated within the community of practice (participation), interpersonal interaction, and personal development. The experience provides a model that humans participate in and with cultural/social, institutional practices. The social interaction refers to the process of learning as engaged between people and environment. Development signifies that the individual has changed through his/her learning and is transformed into subsequent similar activities later. Sociocultural scholars’ beliefs about learning, such as Dewey, Vygotsky, Rogoff, Lave, and Wenger are provided in the discussion to explicate how learning as a sociocultural activity (see table 2.1).

2.1.1 Learning as community of practices

There are many different understandings of learning related to different views of knowledge. In the conventional view, knowledge is viewed as a thing that people can possess or acquire. Learning is a process of acquiring, receiving, memorizing, and repeating what is already presented in books and in the head of experts. As learning is knowledge acquisition, the teacher is perceived as a knowledge presenter, whereas the learner is a knowledge receiver who is passive like an empty container waiting for someone to fill in the knowledge (Freire, 1970). This concept of learning is a knowledge
transmission process. It assumes that there is no learning without teaching. What the teacher teaches is what the student will learn. Based on this view of knowledge acquisition, the teacher’s responsibility is to know how to teach and the student’s is to know how to learn. This notion tends to place the knowledge outside of individuals and to dichotomize teaching and learning into two worlds, which are either focused on internal experience (cognitive development) or external force (instruction).

Dewey (1938) proposed, in contrast to the notion of knowledge as acquisition, that we live in a world of things and people and our experiences with them. As a game needs to follow rules, our everyday life is operated within a social context of norms and expectations. We are not outside the community, but a part of it. From Dewey’s point of view, individuals cannot live or learn without the social world. How we construct knowledge is interdependent between individuals and the social process (Rogoff, 1995; Vygotsky, 1978; Wertsch, Rio, & Alvarez, 1995, Lave& Wenger, 1991).

Dewey (1938) claimed that learning is not knowledge acquisition but social experience. Experience is participating in activities. What we learn depends upon the quality of experience we have. Dewey (1938) believed that knowledge is not out there somewhere but rather is embedded in the world in which we participate. Knowledge is grounded in human’s actions. When people participate in an action, they experience what they are doing to create knowledge. Thereby, Dewey insists that every educative process should begin with doing. Without doing, learning will fly in the air. Dewey believed that when students have hands-on educational activities, such as cooking, and sewing that comes from their everyday experience that they create and use knowledge. From his point of view, learning is in practice rather than of practice. To learn means to have experiences
in everyday practice. When a person joins an activity, the person takes part by putting himself/herself in the position of participating in an activity context.

Table 2.1: Summary of learning from sociocultural perspectives

<table>
<thead>
<tr>
<th>Theory</th>
<th>Learning Content</th>
<th>Personal practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dewey’s Experience &amp; Education (1938)</strong></td>
<td>Learning is experience Learning is doing. Knowledge is in reflective practice.</td>
<td>Learning is a social interaction (experience does not happen in a vacuum)</td>
</tr>
<tr>
<td><strong>Vygotsky’s ZPD (1978)</strong></td>
<td>The external world (tools and signs) influences our understanding of the activities in which we participate. Learning is inherently sociocultural and historical</td>
<td>Development is determined under adult guidance (instruction) or collaboration with more capable peers.</td>
</tr>
<tr>
<td><strong>Lave &amp; Wenger’s Situated learning (1991)</strong></td>
<td>Knowledge is thoroughly situated in the lives of persons and in the cultural that makes it possible. Learning is situated -Comprehensive understanding involves the person and activity in and with the world. The agent, activity, and the world mutually constitute each other.</td>
<td>Legitimate peripheral participation— Learning is newcomers and old-timers engaging in social practices. Newcomers observe, listen, ask, and imitate how old-timers do things, thus they learn to participate in the situated practices.</td>
</tr>
<tr>
<td><strong>Barbara Rogoff’s Sociocultural Activity (1995)</strong></td>
<td>Apprenticeship in community of community practice plane which is culturally and institutionally originated in which apprentices work with masters in understanding the means of learning.</td>
<td>Guided participation Master and novices are co-participants. Learning is communication / coordination, engagement/ arrangement.</td>
</tr>
</tbody>
</table>
Vygotsky believed that learning and development are interrelated from our very first
day of life (Vygotsky, 1978, p. 84). He emphasized the cultural line of development
because he believed that social life determines mental activity. From Vygotsky’s point of
view, human’s development cannot be understood by a study of the individual alone
rather the external social world in which that individual life has developed must be
examined. He wrote: “Every function in the child’s cultural development appears twice,
on two levels. First, on the social, and later on the psychological level; first, between
people as an interpsychological category, and then inside the child, as an
intrapsychological category” (Vygotsky, 1978, p. 128). In this way, the social and the
individual are brought together.

From Vygotsky’s point of view (1978), human development (learning) is inherently
sociocultural. The mechanism of individual developmental change is rooted in society
and culture. He believes human action, including learning, is mediated by tools and signs.
When a person joins an activity, she/he need to employ the tools or signs in order to
perceive and then conduct the activity. That is, humans use the external world such as
tools/signs to mediate and understand their activities. However, the tool systems and sign
systems are created by societies across human history. Therefore, a meaningful learning
context is inherently sociocultural and historical in that it incorporates socially evolved
and socially organized tools (Burner, 1996; Wertsch, 1998).

Dewey viewed learning as participating in activities and Vygotsky perceived
human action involved with signs and tools historically and socially. Similarly Lave and
Wenger describe learning as “situated learning” (Lave & Wenger, 1991, p. 31). In their
view, learning is not merely situated in a practice. They believe that learning is an
essential and inseparable aspect of social practice in the lived-in world. It is more than learning by doing or human thought; it is action located in space and time with others. Their perspective is that “there is no activity that is not situated” (p. 33). This position focuses on how agents (participants), activity, and the world constitute each other. They view learning as a holistic process that is situated in and with the world as a community of practice. How people perceive the activity and practice it with others, and how the world and human value need to be considered together in order that they can construct knowledge through doing activity. From their point of view, learning is not only making meaning through practice in an activity or using tool or signs to understand activities for making meaning. More importantly, learners have to situate their learning with others and the world in order to making meaning.

Barbara Rogoff (1995) proposes the metaphor of apprenticeship within a community practice. She emphasizes that apprenticeship involves more than an apprentice–master dyad. In particular, she pays attention to the community practice which is culturally and institutionally organized. As less experienced learners engage in activities with more experienced people, they take different roles within a community practice toward the accomplishment of goals. Through practicing in a community, apprentices recognize the goal, cultural constraints, resources, and values and have advanced their skills and understanding of activities. As a result apprentices become more responsible participants and understand how their learning is related to others.

Wenger has developed a concept of a “communities of practice” (1998). Here learning is described as an essential part of our everyday life. It exists in our relationships, our communities, and our organizations. Communities of practice include
joint enterprise, mutual engagement, and shared repertoire. Learning is a way of making meaning through participating in a community with others to become and understand who we are within that community.

2.1.2 Learning on the interpersonal plane as social interaction

Dewey (1938) believed that learning is an experience in which individuals learn by participating in educational experiences. However, experience does not happen in a vacuum. Dewey believed that interaction was a necessary aspect of experience. The individual is inseparable from the environment. Books we read or people we talk with provide experiences for us to learn. Thereby, learning is a social interaction that always involves people and the environment. From Dewey’s point of view, sources outside an individual give information to enrich the experience of learning. Based on this notion, learning not only stays at the personal plane but also involves the interpersonal plane.

Based on Vygotsky’s Zone of Proximal Development (ZPD) theory (1978), children learn under adult guidance or in collaboration with more capable peers. This process moves learners from the actual level to the potential level. The assistance comes from teachers, parents, peers, and even materials which play an important role in the learning process. In Vygotsky’s theory of the ZPD, children’s development is determined through problem solving under adult guidance or in collaboration with more capable peers. The concept of ZPD generally exemplifies Vygotsky’s concern with the role of assistance or instruction. Learning is embedded in interpersonal interactions. By developing this concept, Vygotsky advocates learning and instruction as guided by various degrees of expertise (Vygotsky, 1978). That is, learning involves interactions between novices
(learners) and more capable and knowledgeable individuals within sociocultural and historical activities.

We should note, however, that Vygotsky never specified the forms of social assistance for learners that constitute a ZPD. He did not go beyond general perceptions of assistance (Moll, 1990). In Lave and Wengner’s “situated learning” (1991), they emphasize legitimate peripheral participation in which newcomers observe, ask, listen to, and imitate how old timers do things together. As newcomers and old-timers interact with each other within in a social practice, newcomers understand the specific goals, values, knowledge, and skills that are enacted in participation. Their participation progressively moves from peripheral to central.

Barbara Rogoff (1995) uses the concept of guided participation to develop the concept of an interpersonal plane. The idea of guided participation is both novices and masters as co-participants in an activity. From her point of view, learning is a collaborative process (Rogoff & Gardner, 1984). In this process, instead of explaining and demonstrating the task, the master guides the novices through the task in which they are involved. Through communicating and coordinating with each other (Rogoff, 1990), the master (teacher) understands who the novices (students) are and what they have to arrange to facilitate learning. They can thus structure novices’ (students’) participation in activities. Within the interpersonal engagements and arrangements in an activity, novices (students) and masters (teachers) exchange ideas and values in seeking a common ground of understanding in order to proceed with the activity.

In Wenger’s concept of a “communities of practice” (1998), he emphasizes that practice takes place in social relationships. However, he dose not emphasize the novice/
master relationship but rather describes how diverse members can play different roles in the community. They learn from and contribute to each other and make the community unique. However, as there are differences among the group, tension and conflict happen within communities of practice. Hence, people have to negotiate based on mutual engagement in order to construct the common knowledge and goals of their practice. By way of negotiating, shared repertoire and joint enterprises can be built.

2.1.3 Learning on the personal plane as development

As I discussed above, learning is an experience of social interaction. However, the experience needs to include continuity. Dewey (1938) asserted that every experience is a moving force.

The quality of any experience has two aspects. There is an immediate aspect of agreeableness or disagreeableness, and there is its influence upon later experiences. ……they promote having desirable future experiences. Just as no man lives or dies to himself, so no experience lives and dies to itself. Wholly independent of desire of intent, every experience lives on the future experiences (p. 27).

From Dewey’s point of view, experiences can provide us with opportunities for continuing growth in future experiences. Every experience is a moving force in terms of developing and growing. Based on this notion, learning is development which involves a change process. What we learn today is the force that leads us to learn tomorrow.

Through this process of learning, when we engage in new activities, we are capable of performing new tasks, and are able to acquire new understandings. If we only focus on the results of learning in a specific practice situation, the experience will only belong to that fixed situation and will not give direction and meaning to subsequent learning.

In Vygotsky’s concept of the ZPD, the zone of proximal development is “the distance between the actual developmental level, as determined by impendent problem
solving and the level of potential development as determined thorough problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). Vygotsky demonstrates that what is in the zone of proximal development today will be actual developmental tomorrow. That is, what people can do with assistance today they will be able to do by themselves tomorrow. For Vygotsky, learning is a cyclical process in which learning with assistance from others can be led from an actual developmental level to a potential developmental level.

Rogoff (1995) uses the idea of participatory appropriation to explain how “individuals transform their understanding of and responsibility for activities through their own participation in the community plane” (p. 150). In the process of learning, we need to make a connection between ourselves and the world in which we live. Because learning is development, what students learn today in the school should be able to be applied in the world in which they live tomorrow. For this reason, learning should move ahead of the learner’s development and lead it forward. That is, through the process of learning, learners change and become prepared for subsequent similar activities (Rogoff, 1995).

Lave and Wenger emphasize situated learning as a change process (1991). They use learning trajectories to describe the learning that takes place in a community of practice as newcomers move from peripheral participation to full participation and thus become old-timers. They are not only developing a form of membership but also learning who they are. By doing so, as they involve in new activities, they are able to perform new tasks, and to build new membership. From their point of view, learning is the process to becoming a “whole person.” Wenger in his “communities of practice” (1998) also
develops the idea of “identity” as a learning component. He believes that learning is the process in negotiating the meaning of our experience of membership in communities of practice. As learning occurs in communities of practice, we come to understand what we are doing, what we can/cannot do, and how we do things collectively and individually. As a result, we are becoming who we are in the community.

2.1.4 Cultural tools in learning contexts

Sociocultural perspectives emphasize the relation between personal and social worlds. To understand and make connections to the world, Wertsch et al (1995) drew on Vygotsky’s notion of mediation to explain how the external and the internal, as well as the social and the individual work together. They believe that the notion of mediation has an essential role in the basic formulation of sociocultural theory.

Wertsch uses Vygotsky’s notion of higher mental functions (logical thinking) and elementary mental functions (memory, attention) and the idea of the external and internal world (1978) as the basis for further developing the idea of mediation. That is, in order to understand the world, we need to participate in an action with people or cultural tools. As two sides of a river need a bridge to make the connection, humans need cultural tools to mediate between them and their action (world). In other words, cultural tools connect the internal and external worlds. To clarify the idea of cultural tools, Vygotsky (1978) writes, “the tools’ function is to serve as the conductor of human influence on the objective of activity; it is externally oriented; it must lead to change in object” (p. 55). Vygotsky explains that humans can use external tools to change and master the external world whereas animals cannot. That is, when we interact with the environment, the cultural
tools we use (such as language, mathematics, writing systems, pens, and calculators) play essential roles in shaping the action.

In Wertsch’s (1995) opinion, cultural tools have two levels of meaning. First, cultural tools are shaped and provided by the external world. Cultural tools are created by humans. Second, those cultural tools support and reshape human’s understandings of the external world as they master the use of the tools. For example, we use a hammer, a cultural tool made by humans, to help us build a house; however, the goal is the house not the hammer. From this notion, cultural tools involved in mediation play an essential role in shaping action. However, cultural tools do not determine or cause action by themselves (Cole & Wertsch, 1996). Indeed, if cultural tools are separated from action and setting, they are powerless to do anything. Cultural tools only have an impact on the action when we use them. This point reminds us that mediation or cultural tools cannot be considered individually. Instead, mediation is best thought of as a process involving the potential of cultural tools to shape action, and the unique use of these tools to shape what goals and activities are possible (Wertsch, 1995).

Learning involves experience, social interaction, and development, in order to understand the world we live in. The process of learning involves a community of practice where individuals interact. It involves people, various activities, and world. Through participating in meaningful activities, people construct meanings in terms of understanding the relation between individuals and the social world. That is, learning is mediated by activities. It must be considered as a mediated action in which we use various cultural tools in the activity to mediate our learning.

2.1.4.1 The function of cultural tools in learning
Wertsch (1995) uses pole vaulting as an example to explain mediated action. Vaulters cannot jump over a cross bar without holding a pole. In this sense, without using cultural tools, we cannot proceed through learning to understand the world. In the classroom, we can see the teacher use various tools to enhance students’ learning such as verbal explanations, textbooks, and computers. Teachers use tools, which students are familiar with in their everyday lives, in order to mediate students’ learning. For example, an American teacher teaching a geography lesson about Taiwan uses a globe to point out where the country is located, and uses a video to present how people in Taiwan live. In addition, students use the internet to do the research about Taiwan’s climate, and use a printer to print out a report for their presentation. Therefore, the globe, the video, the internet, and the printer are cultural tools to be used in this process of teaching and learning. From this example, we definitely see cultural tools enhance the process of teaching and learning. Because of cultural tools, students understand the content more clearly.

When we use cultural tools to re-create and re-organize learning, it changes the way we learn and perceive knowledge as well. However, as I mentioned before, we must keep in mind that cultural tools cannot shape our educational practice unless we use them meaningfully. To me, cultural tools are powerless; teachers and students are the people who have the power to use them to reconstruct teaching and learning. Lave and Wenger (1991) use the example of a window to explain the function of cultural tools. If a wall does not have a window, we cannot see the outside world. However, if there is a window, we will be able to see the outside world through it but the window is no longer important. Applying this notion to educational practice, we must always remember that cultural
tools are used to support and mediate educational practice. On the one hand, cultural tools function to make learning visible; on the other hand, a cultural tool itself should be invisible.

2.1.4.2 No universal tools in learning context

Because cultural tools are shaped by sociocultural settings, they change according to the goal and the setting. Thus, there are no universal tools to use for cultural mediation (Cole & Wertsch, 1996). In the example of pole vaulting, Wertsch describes how vaulters originally used bamboo as a tool to jump. However, through time the vaulting pole has changed from bamboo, to aluminum, to fiberglass. We do not see vaulters use a bamboo pole to perform today because it is not an appropriate tool for pole vaulting. Cultural tools, such as the pole, change over time. Another example to illustrate this idea is that Americans use a fork and knife as a cultural tool for eating while Taiwanese use chopsticks. The cultural tool for eating is diverse due to the location and culture. From both examples, we understand the fact that cultural tools are culturally, historically, and institutionally situated (Wertsch, 1995).

Applying the notion of cultural tools as situated in sociocultural contexts within educational practice, there are no universal tools for learning. For example, twenty years ago, while I was an elementary teacher in Taiwan, the abacus was considered an appropriate tool to enhance students’ mathematics’ learning. However, students in my country today learn mathematics with a calculator. Thereby, the use of cultural tools in educational practice has changed. When teachers consider using a tool to communicate with their students, the choice of appropriate tools to use in the process of learning depends on the context of learning and the goals. Teachers have to investigate appropriate
tools for approaching students’ diverse needs and ways of knowing. Moreover, since cultural tools that are used in learning have changed, the way teachers use the tool to teach must also change. That is, as soon as the learning materials (cultural tools) change, the practice of learning needs to change too.

2.1.4.3 Multiple tools in learning context

There is no tool that is adequate to all tasks because every cultural tool has its limitations (Cole & Wertsch, 1996). However, the goal of learning is to understand the world in which we live, which is a holistic process. In this process, if children’s learning is limited to one tool, like textbooks, or the teacher only uses verbal explanations, the process of learning will be limited. In other words, educational practice needs multiple tools. As a report shows “people generally perceive 10% of what they read, 20% of what they hear, 30% of what they see, and 50% of what they hear and see” (as cited in Bagui, 1998, p. 5). We understand that when we can both see and hear, we will experience more and understand the world better. Therefore, when information is processed through various paths we will learn better.

Multiple tools open different avenues for us to perceive the information in order to experience differences. It provides us with multiple perspectives which open the possibility for us to see the world differently. When teachers afford multiple tools for helping students to learn, students’ imagination will be free to explore within their participation. As a result, learning is not dominated by one tool or one routine. Students will enjoy learning more and understand the world deeper if the communication between teaching and learning provides more diverse experiences. Therefore, in learning contexts,
teachers need to provide multiple ways of seeing, knowing, and interpreting in order to bring students to see the world through diverse ways of learning.

For example, in a traditional assessment, teachers use paper-pencil tests to evaluate students’ achievements. Relying on this form of assessment, teachers value one kind of learning only. That is, teachers want to know how much of the knowledge has been put into the students’ heads. However, according to Gardner (1993), people have multiple intelligences. Students can learn different things and learn in different ways. For this reason, the students’ performance of their learning should not be through one route only. E-portfolios have the potential to assess learning in many different ways. With e-portfolios, we can use text, sound, pictures, and videos to reduce the one-tool limitation. Using e-portfolios to assess students’ learning gives the students an opportunity to present their learning as a whole and teachers can see the students’ complete repertoire of learning abilities.

2.2 Teacher education in sociocultural context

Green (2001) notes that the purpose of education is defined by the culture we live in. That is, education is situated in the sociocultural context, as well as teacher education. Nowadays, a new mission for education is the expectation that all students will learn and perform at a high level (Darling-Hammond, Wise, & Klein, 1999). However, due to the fact that many of students demonstrate low academic achievement, and because people believe that the quality of teaching affects student achievement, the public has begun to criticize teacher education and certification systems for not contributing to teachers’ effectiveness. The result has led to a debate over teacher education preparation. In the debate about teacher preparation, one side advocates professional teaching and teacher
education (Cochran-Smith & Fries, 2001; Linda Darling-Hammond & Youngs, 2002; Yinger & Nolen, 2003), whereas another view argues for the deregulation of teacher preparation (Ballou & Podgursky, 1999; Farkas & Johnson, 1997; Stotcky, 1999). Due to different voices in this discussion, teacher educators and the public debate how to best prepare high quality teachers for the future.

Teacher educators, on the first side of this argument, argue from a sociocultural perspective that teaching is a profession which requires specialized education and knowledge to teach through everyday educational practice. Dewey demonstrated that “the educative process is a continuous process of growth, having as its aim at every stage an added capacity of growth” (Dewey, 1916, p. 54). From this perspective, teacher education is not about skills training, but rather about cultivates teachers’ consciousness toward their teaching. Through professional learning in teacher education programs, preservice teachers are able to examine critically what they believe and value in their practices to become reflective teachers. Therefore, developing preservice teachers’ ability to grow professionally is an important goal in teacher education programs as the first phase of their professional journey.

In this section, this literature review first discusses the change in the expectations for teachers’ learning. Second, as many teacher education programs assert that reflective thinking supports the teachers’ ability to learn and grow (Richardson, 1990; Zeichner & Liston, 1996), a rationale for reflective thinking as an appropriate goal for preservice teachers is discussed.

2.2.1 Changes in the expectation for teacher learning
Green (2001) notes that the purpose of education is defined by the culture we live in. As culture evolves, teachers need to constantly refine their approaches to teaching in order to enhance students’ learning. Different conceptions of teacher learning lead to very different ideas about how to improve teacher education (Cochran-Smith & Lytle, 2001). In the early days, teaching was viewed as a craft. While the mission of teacher education programs was to train teachers to teach, the traditional preservice teacher learning focused on the acquisition of specific teaching skills (Worley & Fry, 2002).

The early notion of teaching assumed that teaching is a set of skills which teachers need to acquire in order to teach well. This view emphasized behaviorism and mechanical approaches to teacher learning (Blackwell, Futrell, & Imig, 2003). As a result, the focus of teacher education was on teachers and teaching rather than on students and learning. The purpose of teacher education programs, based on this traditional view, was to prepare teachers to learn how to teach. This approach was understood as a skill-based approach that trained teachers with efficient strategies in order for them to perform in particular ways in their classrooms (Cochran-Smith & Lytle, 2001; Worley & Fry, 2002). The training model of teacher education programs concentrated on expanding an individual’s repertoire of well-defined and skillful classroom practices to create a view of teachers as experts in the class who had answers for students. Preservice teachers were placed in a passive role as consumers to gain knowledge of teaching and to ensure quality teaching.

However, Darling-Hammond (1990) advocates that the view of teaching needs to change from perceiving teachers as technicians to perceiving teachers as professionals. Darling-Hammond argues that skill-based training models have not been found effective when teachers encounter the complex and challenging reforms to transform school
organization and curriculums (Darling-Hammond & Berry, 1995). To move away from the view of teachers as technicians and to consider teachers as professionals, Darling-Hammond advocates a client-oriented and knowledge based model for teachers’ learning. For Darling-Hammond, teaching is a profession and teachers are obligated to pursue the best interests of the clients (students) (1990). In order to pursue the best interests for the clients (students), teachers need to inquire into who the students are, what the students need, what experience the students have, and how teaching can meet their needs. To do so, she believes teachers need to continuously advance their own knowledge in both practice and theory.

Cochran-Smith and Lytle (1999) also question the traditional view that teachers who know more teach better. They propose a “new model” of teacher education that is no longer seen as periodic staff development, but as a “new paradigm” of professional development where both prospective and experienced teachers think reflectively about their work. That is, preservice teachers’ learning is no longer seen as a one-time process of “teacher training” wherein preservice teachers are prepared with methods in the subject areas and sent out to “practice” teaching. Cochran-Smith and Lytle compare three approaches of teachers’ learning that define the relationship between knowledge and practice: knowledge-for-practice, knowledge-in-practice, and knowledge-of-practice (Cochran-Smith & Lytle, 1999).

Cochran-Smith and Lytle argue that knowledge-for-practice approaches of teachers’ learning focus on the notion of expertise in teaching and its purpose is to improve the practice. Teacher education programs animated by knowledge-for-practice emphasize preparing preservice teachers to acquire a formal knowledge base such as content area
knowledge and teaching strategies and skills. Through teacher training program, teachers implement, translate, use, or update what they have learned of the knowledge base into their teaching practice. As a result, teaching is understood as transmission and learning is accruing knowledge. On the contrary, the knowledge-in-practice approach emphasizes that knowledge arises in the action. Instead of assuming knowledge comes from experts outside the classroom, knowledge-in-practice stresses that professional expertise is embedded in the teaching profession itself. Teaching is understood as a process of acting and thinking in the midst of classroom life. Therefore, teachers’ learning is the understanding of their own action. Based on the stance of knowledge-in-practice, teacher education programs often teach preservice teachers how to reflect on their experiences. The belief is that when teachers have opportunities to inquire, examine, and reflect on their actions, they learn how to teach better. However, this orientation focused on practical knowledge is oriented to individual practice without taking the social world into account. Reflection is limited to local and personal knowledge that is not connected with a larger social context.

Cochran-Smith & Lytle (2001) claim that the conception of knowledge-of-practice in teacher learning is a lifelong process in which teachers as agents take an inquiry stance and work within communities “to generate local knowledge, envision and theorize their practice, and interpret and interrogate the theory and research of others” (p. 50). From this perspective, teacher learning takes place over time rather than in isolated moments within their own classrooms. By using a “knowledge of practice” approach, teachers play vital roles in linking their action to larger social, cultural, and political context. That is, teacher learning crosses both school-based and university-based experiences and both
theory and practice knowledge. Teacher learning is not only from their actions but it also takes place in a larger social context. It is culture building not skill training. It is deeply embedded in the daily experience of learning, teaching, and schooling (Cochran-Smith & Lytle, 2001). The knowledge-of-practice in teacher education program emphasizes promoting and guiding preservice teachers’ critical reflection on social, cultural, political, and economic issues related to educational practice. In teacher education programs, preservice teachers are helped to understand the social conditions of schooling, the subject matter, and the students they teach (Cochran-Smith & Lytle, 1999).

Considering teacher learning as a life-long process, Lieberman and Miller (1999) propose the idea of “growth-in-practice” (p. 59) as a model. They believe that professional development only occurs when teachers acquire the opportunities to learn from theory and practice as part of their jobs. School cultures, particularly collegial sharing, can influence the professional development of teachers. Therefore, they suggest that developing a professional community from the bottom (teacher’s practice) to the top (policies) provides support necessary for teacher professional development. Teachers are encouraged to integrate the internal knowledge from their own teaching and the external knowledge from others, including research and reform ideas. Such an approach creates collaboration and promotes sharing of experiences, opinions, and ideas and thus enhances the process of professional development.

2.2.2 A rationale for reflective thinking

The knowledge that preservice teachers need in order to be prepared to teach effectively has become an important issue in teacher education. According to new perspectives on teachers’ learning, knowledge of teaching is never fixed or permanent.
As Cochran-Smith and Lytle (2001) propose, teacher education programs should no longer focus on training preservice teachers to teach but rather to educate them to “learn to teach” through their everyday teaching.

Since Schön’s “The Reflective Practitioner: How Professionals Think in Action” was published in 1983, many teacher education programs have been interested in promoting preservice teachers’ reflective thinking. Teacher educators have begun to discuss the meaning of reflective practice and how to implement it in education (Richardson, 1990; Zeichner & Liston, 1996). The concept of reflective thinking has been in the literature for some time. It provides a rationale of reflective thinking as an aspect of teacher learning. Dewey’s deliberated reflective thinking, Schön’s reflection-in-action, and on-action, and Zeichner’s perspective of critical reflective thinking are discussed in this review. Moreover, the role of reflection in teacher learning is illustrated.

2.2.2.1 Dewey’s Deliberated Reflective Thinking

Many educators who discuss the origin of reflective thinking in professional development initially draw on Dewey’s concept (Cruickshank, 1987; Grant & Zeichner, 2001; Laboskey, 1994; Richardson, 1990; L. Valli, 1997; Zeichner & Liston, 1996). Dewey provided the foundation for understanding reflective thinking. In the book How We Think (1933), Dewey made an important distinction between reflective and routine action. He believed that routine action is guided by impulse, tradition, and authority. Unreflective teachers often uncritically accept what happens in their classrooms and schools as unproblematic situations. They make an effort to find the most effective and efficient ways to do their jobs easily. In contrast, as Dewey defined, reflective action refers to the behavior that involves “active, persistent consideration of any belief or
supposed form of knowledge in the light of grounds that support it and the future
conclusions to which it tends” (p. 9). From Dewey’s point of view, good teaching cannot
be performed without thinking. Teachers are thinkers who reflect upon their teaching
deliberately all the time. According to Dewey (1933), reflective teachers examine their
teaching with open-mindedness, responsibility, and whole-heartedness. Their action
always is directed by the goal and a thoughtfully designed teaching plan. As the result,
teachers are aware of who they are and what they do when they are teaching.

2.2.2.2 Schön’s reflection-in-action and reflection-on-action

Schön’s notion of reflection also has had an important influence on reflective
thinking related to teachers’ learning. To take Dewey’s deliberate thinking further, Schön
(1983) argues that the process of decision-making cannot only rely on a series of
conscious steps in thinking. He proposes knowledge-in-action to demonstrate that
knowledge is inherent in the action. According to Schön, reflection can be seen in two
time frames: “reflection-in-action” and “reflection-on-action.” While teachers are
teaching, they attempt to adjust their instruction by taking into account students’
reactions. Schön calls this “reflection-in-action”. When teachers examine a lesson plan
before and after their instruction, that is called “reflection-on-action”. For Schön,
reflective practitioners reflect both “in” and “on” action. He believes that knowledge is
embedded in practice; if teachers take outside experts’ knowledge into their classroom
practice without reflection, their teaching cannot meet students’ needs. Moreover, they
will not be able to realize the problems in their teaching.

According to Schön, reflection-in-action and on-action permit teachers
(practitioners) to continually develop and learn from their experience. Schön’s view of
reflective thinking gives recognition and value to teachers’ practical knowledge in education. It emphasizes “the need for teachers to give themselves up to the action of the moment and to be researchers and artists in the laboratory of practice, the classroom” (Zeichner & Liston, 1996, p. 17). That is, instead of viewing teaching as a technical skill that depends on outside experts’ knowledge, teachers begin to pay attention to their own practices within the classrooms. This allows teachers to develop their own theories of teaching.

2.2.2.3 The perspective of critical reflective thinking

While many teacher education programs have applied Schön’s notion of knowledge in action to educate pre-service teachers to become reflective practitioners, others have criticized Schön for failing to pay attention to collaboration (Zeichner & Liston, 1996). In Schön’s notion, reflective practice is a solitary process involving only the practitioner and the action. He neglects the social context where actions occur. Schön does not discuss how teachers and other professionals can reflect together in collective reflective thinking. From a sociocultural perspective, professional development is not a solitary activity. Rather it is a social practice taking place within a learning community. Without sharing and confirming their ideas with others, teachers’ reflective thinking will be limited to a personal narrow view or bias. Therefore, the recent works on reflective teaching have stressed the idea of reflection as a social practice and have argued that teachers need to discuss their ideas with other professionals in order to develop reflective thinking (Cochran-Smith & Lytle, 2001; Lieberman & Miller, 1999; Zeichner & Liston, 1996).

Zeichner and Liston (1996) suggest that teachers should be encouraged to focus both on their own practice and on the social context of their practice. As schooling practices
are never neutral and are always related to the larger social order, from Zeichner and Liston’s point of view, teachers need to develop a critical perspective on reflective teaching in order to make the society better. The purpose of teachers’ critical reflection is not only to make a change in their own classroom practice but also to connect their action with larger social situations. To do so, teachers need to pay attention to what they do in the classroom, the purposes of schooling, and social expectation. That is, reflective teachers actively reflect upon their teaching within the educational, social and political contexts in which their teaching is embedded (Valli, 1997; Zeichner & Liston, 1996).

Within a sociocultural perspective, teaching is not a set of permanent fixed skills. Teachers must develop the ability to reflect in order to change and grow and cope with evolving environments. When teachers are practitioners who reflect upon their action within a social context, they become aware of who they are, what they do, and why they do it. Reflective thinking is the heart of practice, the thread of connection, and the understanding of diverse perspective. Through reflective thinking, teachers reconstruct their actions, understanding of teaching and schooling, and self awareness as a teacher (Zeichner & Liston, 1996). Therefore, it is important that teacher education programs develop preservice teachers’ abilities to reflect upon their teaching and upon the educational, social and political contexts. If teacher education programs develop preservice teachers’ reflective thinking as the heart of practice, preservice teachers will develop awareness and understanding of teaching throughout their learning in teacher education programs. They will realize that teaching is not a routine but a complex journey embedded in everyday life in the classroom. Their learning in teacher education, as a result, is not to develop a habit of teaching but a habit of thinking about teaching.
They will keep thinking about what they do day-to-day in their teaching and take the responsibility to grow professionally throughout their teaching careers (Corcoran & Leahy, 2003).

2.3 Electronic portfolios in teacher education

In recent years, two trends have led the reforms in American teacher education. One is the movement toward performance-based assessment for teachers; another is to integrate technology into the teacher education curriculum (Britten, Mullen, & Stuve, 2003; Georgi & Crowe, 1998; McKinney, 1998; Montgomery, 2003). With the movement toward defining teaching as a profession, the qualifications and expectations of a teacher have changed (Campbell, Melenyzer, Nettles, & Wyman, 2000; Cochran-Smith & Fries, 2001; Darling-Hammond, Wise, & Klein, 1999). Traditional assessments, such as multiple-choice questions to assess subject matter knowledge, are inadequate for gaining an accurate view of teachers’ competency in teacher education. In response, a major trend in teacher education programs is to use portfolios to assess preservice teachers’ performance.

As the report of the National Center for Education Statistics has shown, only 20% of teachers felt “very well prepared” to integrated technology into classroom activities (Duhaney, 2001). Most teachers have not had enough training to prepare them to use technology in their teaching (Darling-Hammond, Chung, & Frelow, 2002; Drazdowski, Holodick, & Scappaticci, 1998; Duhaney, 2001; Pellegrino & Altman, 1997; Willis & Mehlinger, 1996). As a result, the concern of integrating technology into teacher education curriculum has drawn many people’s attention. Research on teacher education programs has criticized programs for not preparing future teachers to teach with
technology across the curriculum (Willis & Mehlinger, 1996). Teacher education programs have begun to pay attention. The requirement for technology competency in teacher education has been integrated into teacher education accreditation processes. NCATE, ISTE, and many state’s professional standards boards have placed technology integration in their standards.

Many teacher education programs have switched their focus from developing a traditional portfolio to an electronic portfolio, in order to accomplish the mission of performance–based teacher assessment and technology integration. That is, they are using electronic portfolios to support preservice teachers’ professional growth and technology.

Electronic portfolios in teacher education are discussed in this section of the literature review. The first section is a general definition of portfolios and e-portfolios. Second, recent studies on using e-portfolios are reviewed to discuss how e-portfolios have been used and the advantages and challenges of using e-portfolios in teacher education programs. Third, three models are introduced to explain how to develop an e-portfolio in teacher education programs.

2.3.1 The definition of electronic portfolios in teacher education

In the past, preservice teachers’ progress toward degrees and certification was determined by course completion, grades, and test scores. As the performance-based evaluation movement has developed since the 1980s, teacher licensing has shifted from paper/pencil test to performance-based assessment (Darling-Hammond et al., 1999; Mullen, Bauer, & Newbold, 2001). Teacher education programs have begun to develop the use of portfolio assessment to evaluate more accurately what preservice teachers know and are able to do.
Based on the Northwest Evaluation Association’s definition of portfolios:

A portfolio is a purposeful collection of student work that exhibits that student’s efforts, progress, and achievements in one or more areas. The collection must include student participation in selecting contents, the criteria for selection, the criteria for judging merit, and evidence of student self-reflection. (cited in Paulson, Paulson, & Meyer, 1991, p. 60)

Paulson et al (1991) believe a portfolio is a portfolio when it can provide a complex and comprehensive view of the developer’s performance in context. That is, portfolios should include collection, selection, and reflection. Bullock and Hawk (2001) argue that portfolios need to comprise of four elements: purpose, audience, evidence, and reflection. Without these components, portfolios would be no more than a scrapbook. According to Campbell et al (2004), a portfolio is an organized, structured, goal–driven documentation filled with the evidence of the teacher’s professional growth and achievement.

Diez (1994) uses the metaphor of a mirror, a map and a sonnet to develop the concept of a portfolio. From her point of view, a portfolio is like a sonnet that needs to be structured in order to allow the developer to see his/her own work. When the developers see their work in the portfolio, the portfolio is a mirror that leads them to see what they have learned and know. Furthermore, like a map, portfolios can aid them in planning and setting their next steps of learning.

Portfolios in teacher education programs are more than a collection of artifacts or a container in which preservice teachers place their works. The development of a portfolio is a way of learning that can help preservice teachers examine, support, and improve teaching and learning.

As Barrett (2000) notes, electronic portfolios include two bodies of literature--multimedia development and portfolio development. Both processes are essential for
effective electronic portfolio development. That is, an electronic portfolio contains essentially the same material as the traditional form of portfolio. The traditional form of portfolio in teacher education is paper-based. The artifacts that teachers collected/selected for their portfolios are comprised of texts and images on paper. Traditional portfolios are collected and presented within file folders or a three-ring binder (Bauer & Dunn, 2003; Gibson & Barrett, 2003). However, e-portfolios go beyond the paper and pencil products to nonlinear hypertexts. E-portfolios drastically change the options for creating, saving, sharing, and storing traditional portfolio materials. In the formats of electronic portfolios, teachers can collect and organize their artifacts in varied media types, including digital photos, scanned images, text files, sound, and video (Barrett, 2003b; Campbell et al., 2004; Chatel, 2003). For example, preservice teachers can use a camcorder to videotape their student teaching. Then they can upload video files to their e-portfolios as a video clip that they and others can review. As this type of portfolio is typically published on the Internet (WWW or Web) or on a CD, developers and reviewers can access portfolios through a computer without using large volumes of paper (Costantino & De Lorenzo, 2002).

In general, three types of portfolios have been used in teacher education programs (see table 2.2): process, product, and showcase portfolios (Bullock & Hawk, 2001; Wolf & Dietz, 1998; Zeichner & Wray, 2001). Each type of portfolio leads toward a specific purpose, content, and audience.

The process (working, learning, or formative) portfolio, according to Bullock and Hawk (2001), shows a person’s performance over a period of time. Process portfolios are often larger than other types of portfolios because they contain many artifacts that
teachers carefully select to portray their professional growth over time (Campbell, Cignetti, Melenyzer, Nettles, & Wyman, 2004). Process portfolios provide teachers with an opportunity to explore, extend, and reflect in their own learning. In teacher education programs, this type of portfolio is often used to document preservice teachers’ growth and development throughout the duration of their programs (Zeichner & Wray, 2001). Because the purpose of process portfolios is to show preservice teachers’ growth and development, portfolios are developed progressively throughout the learning process and the main audiences for the portfolio are preservice teachers themselves (Brummett & Campbell, 2002; Costantino & De Lorenzo, 2002).

The product (assessment, summative) portfolio, according to Bullock and Hawk (2001), is a specific set of evidence developed over a short period of time to meet a desired outcome. Wolf (1999) defines it as a “selective collection of teachers’ work and standardized assessments.... The primary purpose of this type of portfolio is to evaluate teacher performance for certification licensure or professional advancement” (p. 13). Therefore, product portfolios present what preservice teachers have learned at a specific time or with a specific learning task (Bullock & Hawk, 2001). It is a summative documentation that includes preservice teachers’ focused work centered on finished products. For this reason, product portfolios are useful in assessing preservice teachers’ achievement and development within a teacher education program.

Like a product portfolio, the employment (showcase, marketing, or presentation) portfolio is a collection of the developer’s best works. However, the purpose of employment portfolios is not for evaluation but for sharing in job interviews or a presentation (Bullock & Hawk, 2001; Wolf, 1996). According to Wolf (1999),
employment portfolios are “customized and attractive collections of information given by teachers to prospective employers and are intended to establish a teacher’s suitability for a specific professional position” (p. 14). The purpose of an employment portfolio is to gain a job. Since job interviewers or employers usually have limited time to review the portfolio and are strongly affected by general impressions, teachers need to limit the number of artifacts to create an exemplary showcase that is representative of their best work. When preservice teachers seek a teaching job, using the e-portfolio they have developed, they can demonstrate to their potential employers their professional competencies. For this reason, preservice teachers are usually motivated to develop employment portfolios.

<table>
<thead>
<tr>
<th>Types of portfolio</th>
<th>Purpose</th>
<th>Content (Artifacts)</th>
<th>Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning portfolio</td>
<td>Document preservice teachers’ growth and development toward professional requirements.</td>
<td>Plentiful artifacts that include all course work, field experience, and student teaching.</td>
<td>Preservice teachers/ teacher education programs</td>
</tr>
<tr>
<td>Process portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td>Evaluate preservice teachers’ specific outcomes</td>
<td>Selective artifacts based on a guideline set or standards</td>
<td>Instructors/ teacher education programs</td>
</tr>
<tr>
<td>Assessment portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interview portfolio</td>
<td>Used in job interviews to gain employment</td>
<td>Resume, and limited artifacts to represent preservice best work and accomplishments.</td>
<td>Interviewers/ employers</td>
</tr>
<tr>
<td>Showcase portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2: Summary of three types of portfolio in teacher education programs
2.3.2 How electronic portfolios have been used in teacher education

Many teacher education programs use electronic portfolio assessment of preservice teachers’ professional growth. The e-portfolio development has grown dramatically in teacher education program in recent years (Adcock, 2003; Barrett, 2003a; Costantino & De Lorenzo, 2002; Montgomery, 2003). According to Barrett (2003), in the 2002 Conference of the Society for Information Technology in Teacher Education, over 40 presentations were given on the topic of electronic portfolios. In the 2004 SITE conference, (http://www.aace.org/conf/site/sessions/index.cfm?fuseaction=PresentationSearch&confID=3014), there were 59 presentations related to the topic of electronic portfolios in teacher education.

E-portfolios in teacher education programs are useful for documenting evidence of preservice teachers’ competencies and for guiding preservice teachers’ long-term professional growth. The following discussion illustrates how e-portfolios have been used in teacher education, and presents the advantages and challenges to implementing electronic portfolios in teacher education.

2.3.2.1 Comprehending assessment for preservice teachers

Due to the current focus on accountability and high stakes assessment for K-12 quality classroom teachers, teacher education programs have increased the urgency for developing a new system of assessment. While teacher education programs move to more performance-based assessment, many have adopted e-portfolio and related criteria for documenting, organizing and evaluating preservice teachers’ skills, knowledge, and dispositions.
The evaluation of preservice teachers’ competencies may be locally defined, based on program themes, and/or competency may be defined by national teaching standards. Some teacher preparation programs integrate standards into preservice teachers’ e-portfolios to ensure that their candidates are qualified teachers in the future. For example, the University of Florida requires preservice teachers to make connections among their course work, their student teaching, and the 12 Florida Accomplished Practices in their e-portfolios (Ring & Foti, 2003). The College of Education at Florida University argues that the e-portfolios demonstrate preservice teachers’ competency and the quality of teacher education program. In another example, preservice teachers’ e-Folios at St. Bonaventure University are organized around the INTASC and ISTE standards to show how preservice teachers’ learning in the program meets these standards (Casey, 2003).

2.3.2.2 Promoting preservice teachers’ reflective thinking

Some educators believe that e-portfolios are useful in the method courses to help preservice teachers reflect upon their learning and accomplish course goals. For example, teacher educators at the University of Nebraska made the commitment to implement e-portfolios in their Human Growth and Learning and the Educational Foundations courses (Adcock, 2003). In their classes, preservice teachers used e-portfolios associated with course activities to better understand the content of the courses. Using e-portfolios allow preservice teachers to promote and document reflective practice. Preservice teachers can reflect upon various artifacts to examine what they have learned. Moreover, they can arrange a dialogue with others by sharing their e-portfolios to promote their reflective thinking. As a result, e-portfolios help preservice teachers become reflective practitioners.
2.3.2.3 Integrating technology into preservice teachers’ learning

As discussed above, e-portfolios are most commonly used in teacher education to demonstrate preservice teachers’ competencies and to foster reflective thinking. Some teacher education programs focus primarily on using e-portfolios to integrate knowledge, skills, and dispositions related to educational and information technology (Bartlett, 2002; Britten et al., 2003). That is, teacher education programs use e-portfolios into preservice teachers’ learning activities, such as curriculum, instruction, field experiences, clinical practice, assessment, and evaluation to develop preservice teachers’ technology competency. For example, at the University of Alaska Anchorage, Barrett utilizes e-portfolios based on ISTE National Education Technology Standards #1, #5 and #6 to help preservice teachers acquire technology skills (Barrett, 2003a). At the University of Hawaii, preservice teachers learn computer programs such as PowerPoint and I-Movie, and also learn to take digital videos, scan photographs, and to add sounds while they are creating their e-portfolios. Preservice teachers agreed that they have learned about technology from the e-portfolio and they could apply what they learned while developing e-portfolios to their future teaching (Bartlett, 2003).

2.3.2.4 Keeping tracking of preservice teachers’ learning

Some teacher education programs propose that e-portfolios are not only for use during the program but also for post graduation learning and development. For example, teacher educators at the University of Florida have tried to facilitate the goal that their graduates will continue to work on their e-portfolios as long as they remain in the teaching profession (Ring & Foti, 2003). To promote this, the University of Florida houses the preservice teachers’ e-portfolios on the college server. In doing so, the
university makes a strong connection with their graduates across the country. On one hand, e-portfolios have become a vehicle for their graduates to continue to grow and become life-long learners in the profession. On the other hand, teacher education programs can keep track of how their preservice teachers have performed in the teaching profession.

2.3.3 Advantages of implementing electronic portfolios in teacher education

The e-portfolio is portable, accessible, and easily distributed. A common complaint about paper-based portfolios is that they require a large amount of space to store materials and artifacts (Georgi & Crowe, 1998). In contrast to paper-based portfolios, e-portfolios use little physical space for storage and display. E-portfolios have a larger storage capacity and multiple modality presentation options so that preservice teachers can have a large volume of work samples, such as videotapes of student teaching, digital photos of students’ works, or PowerPoint presentations of lesson plans. Moreover, as e-portfolios are saved as computer readable files, preservice teachers can view and revise their works from any location any time (i.e. e-portfolios are portable). Preservice teachers can easily duplicate and transport their e-portfolios when they need to share them with others. For example, when the portfolios are published on the Internet they become a public document. Since e–portfolios have the potential of being viewed by a greater number of people, they can receive feedback from multiple sources. When preservice teachers share e-portfolios in a job interview, they can send the website URL ahead or show their e-portfolios to the interviewers without printing cumbersome and inefficient copies. Additionally, because multimedia offers information by using dual coding and nonlinear design, job interviewers will be clearer on what they have read,
seen, and heard in the e-portfolio. That is, through an e-portfolio presentation, preservice teachers can easily show their learning.

The e-portfolio is learner-centered learning. In the process of e-portfolio development, preservice teachers have ownership of how to tell their story (Chen & Mazow, 2002; Hill, 2003). By selecting the evidence of their learning, they construct a picture of themselves within the e-portfolio of who they are, what they have learned, what they can teach, and what they value and believe about teaching. That is, preservice teachers present a unique story about themselves through the e-portfolio because it is their portfolio. No one else decides for them how many artifacts they collect, which artifacts they select, or what reflections they write. In this learner-centered learning, the e-portfolio assists them to recognize their individual responsibilities and take ownership of their learning within that process.

The e-portfolio promotes learning of technology skills and knowledge (Barrett, 2003a; Ring & Foti, 2003, Casey, 2003). To develop an e-portfolio, preservice teachers need to use various technologies for documenting, organizing, and presenting their learning, such as a PowerPoint lesson presentation, an Excel spreadsheet for students’ information or recoding, and digital pictures for student teaching. Once preservice teachers learn these technology skills from a single educational technology course, they can practice these skills while they are developing their e-portfolios. They learn and practice technology skills within a meaningful activity through developing e-portfolios. As a result, the more they practice these technology skills by developing their e-portfolios, the more confident they will become with technology. Most importantly, through reflecting upon their experience of doing their e-portfolios, preservice teachers come to
understand how technology can enhance learning and teaching. E-portfolios create an opportunity for preservice teachers to bring this knowledge of technology into their future teaching.

2.3.4 Different models of electronic portfolio in teacher education

As many teacher education programs have implemented e-portfolios, different models have been developed for various program missions and needs. According to Barrett (2002), there are three basic models for developing e-portfolios in teacher education programs: generic tools, commercial systems, and hybrid system (see table 2.3).

2.3.4.1 Generic tools mode

The generic tools (common tools, off-the-shelf software) model uses software such as word processing, HTML editors, multimedia authoring tools, and portable document format (PDF), to create individualized portfolios. For example, preservice teachers at the University of Alabama use various software sources, such as FrontPage and PowerPoint, to create their e-portfolios (http://projectit.ua.edu/examples.html). At St. Bonaventure University, New York, preservice teachers use the FrontPage template to create their eFolios (http://pt3.sbu.edu/efolios.htm); and at the University of Hawaii, students use PowerPoint to create their e-portfolios (Bartlett, 2003).

As these examples show, the generic tools model allows preservice teachers to construct their portfolios based on personal needs or programs’ requirements. It gives the flexibility and creativity to preservice teachers so that they can design an interface, build navigation, choose colors, and add pictures. Preservice teachers can make their e-portfolios look the way they want. The generic tools model also provides preservice
teachers an opportunity to practice their technology skills. Preservice teachers who employ this model acquire better skills and understanding of the process of e-portfolio development.

While the generic tools model of e-portfolio provides variety for personal creation, it does not allow easy evaluation based on a rubric (Gibson & Barrett, 2003). Thus, it is difficult to assess the students’ work to demonstrate the teacher education program’s validity and accountability when programs are reviewed. Another concern of the generic tools model is, using this model, preservice teachers are required to spend a great deal of time developing their e-portfolios. Preservice teachers who do not have much experience with technology may spend more energy on learning technological skills than on the e-portfolio content such as writing reflections. As a result, because of time consuming constraints and coursework demands, preservice teachers may see the e-portfolio as an assignment rather than a way of learning.

2.3.4.2 Commercial systems model

In the commercial systems model, teacher education programs purchase an electronic portfolio package from a commercial vendor. In this model, a commercial vendor usually provides server space, programming, and databases. For example, the teacher education program at Illinois State University (http://coe.ilstu.edu/currentstudents/portfolios/index.shtml) uses the online e-portfolio system College LiveText (http://college.livetext.com/college/index.html) to create preservice teachers’ e-portfolios. The College of Saint Elizabeth uses another online e-portfolio system TaskStream (http://www.taskstream.com/main/login/default.asp) for preservice teachers to document their students’ teaching works (Wilder & Adelman,
A commercial system provides a structure and server space for preservice teachers to store and organize their portfolio. Using the commercial system model, preservice teachers are not required to know anything about HTML and the linking process; their primary task is to create the content of electronic portfolios. As commercial systems have already provided a well-organized structure for preservice teachers to upload their artifacts, it limits the creativity and diversity of e-portfolio. However, as preservice teachers use the same structure to organize e-portfolios, teacher education programs can more easily collect, analyze, and assess their preservice teachers’ achievement within a particular professional, state, or institutional standards for programs’ assessment. That is, when a teacher program plans to develop an electronic portfolio to contribute to a program’s validity and accountability with only a few physical and human technician resources, choosing a customized system may be a better way to start the e-portfolio.

2.3.5.3 Hybrid systems

Since the generic tools model and the commercial systems model have their own strengths and limitations, some teacher education programs have recently developed a third model-- hybrid systems-- borrowing from generic tools and commercial systems as to create their own unique model (Gibson & Barrett, 2003). Teacher education programs can use a hybrid systems model to develop e-portfolios, providing the benefits of balancing creativity with contributing to the program validity and creditability. For example, the University of Florida uses Netscape Communicator/or Claris Home Page web editor to create web-based e-portfolios templates (http://www.coe.ufl.edu/OIT/ep-
templates.html) that their preservice teachers download to develop their e-portfolios (Ring & Foti, 2003). The music teacher education at Case Western Reserve University, Cleveland, Ohio, also created a template model by using Mozilla Composer that their preservice teachers can utilize as a framework (http://music.cwru.edu/mused/portfolios.html).

Currently, the newest approach in hybrid systems models is an open source software to organize e-portfolio systems for university-wide on-line assessment portfolios. For example, IUPUI, Penn State, UCLA, and University of Wisconsin-Eau Claire have used Epsilen Portfolios (ePortfolio) to organize students’ work (http://with.iupui.edu/epsilen/index.htm). The University of Minnesota and the University of Delaware use Open Source Portfolio Initiative (http://www.theospi.org/) to design their e-portfolio framework. These two e-portfolio management systems allow users to modify, enhance, and adapt the software source code based on institutional needs.

Hybrid systems allow teacher education programs to have a greater level of control in the design of the e-portfolios to meet their needs. By creating templates or modifying the software source code, teacher education programs can create a unique e-portfolio framework based on their programs’ purpose, without the control of business vendors. In addition, preservice teachers have a degree of creative control and opportunity for technology skills practice, such as changing colors and fonts or adding graphics. As a well-organized structure for e-portfolios is established, this model minimizes some of the technical requirements for students in developing their e-portfolios. Moreover, with a common structure, teacher education programs can evaluate preservice teachers’ e-portfolio more easily. However, a hybrid systems model requires that the teacher
programs have support from technology personnel who can develop templates or modify the source codes.

<table>
<thead>
<tr>
<th>Software/Source</th>
<th>Generic Tools</th>
<th>Commercial Systems</th>
<th>Hybrid Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FrontPage, PowerPoint, Microsoft Word, Netscape Communicator, Claris Home Page web editor</td>
<td>LiveText, WebCT, Blackboard, Nuventive, Interfolio, TaskStream's Web Folio Builder, FolioLive TrueOutcomes</td>
<td>Open Source Portfolio Initiative, ePortConsorium</td>
</tr>
<tr>
<td>Advantages</td>
<td>Creativity, flexibility and diversity. Have more opportunity to practice technology skills.</td>
<td>Assess, collect, and analyze students’ performance easily. No need of programs’ physical and personal resource</td>
<td>Fulfill the unique purpose of programs. Evaluate preservice teachers’ e-portfolio more easily. Students are given a degree of creative control.</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Hard to assess preservice teachers’ work due to variety of e-portfolios. Require a great deal of time to practice technology.</td>
<td>Limited personal creativity, and diversity. Controlled by vendors. Need to pay the fee.</td>
<td>Require personnel resources.</td>
</tr>
</tbody>
</table>

Table 2.3: The analysis of three models of e-portfolio for using in teacher education
CHAPTER 3

METHODOLOGY

Our methodological decisions reflect who we are as researchers and influence the
way the word are written and how we tell and retell the story (Jones, 2002). I explicate
my research perspective by illustrating how I conducted, perceived, and interpreted the
research process including my research role, the research design, the method of data
collection, and data analysis. In addition, I describe how I maintained the trustworthiness
and discuss the limitations of my study.

3.1 Research perspective

The main goal of this research was to explore preservice teachers’ learning
experiences in a sociocultural context. The focus was on a group of early childhood
preservice teachers learned with electronic portfolio to understand how preservice
teachers grew and developed their professional competency during the learning process.
As Denzin and Lincoln stated, “qualitative research in sociology and anthropology was
born out of concern to understand the ‘other’ ” (Denzin & Lincoln, 2000, p. 2), therefore,
qualitative research is an appropriated approach for this nature research to describe,
interpret for understanding preservice teachers’ learning experience.

Especially, ethnography guided this research as this research situated in the field of
education by combing research design, fieldwork, and various method of inquiry to
produce the description, and interpretation, and representation of human life (Tedlock, 2000). That is, through the research of ethnography, how preservice teachers made sense of their learning of electronic portfolio was understood and explicated by field notes, observations, survey, and interviews. In particularity, as ethnographers argued, researchers cannot study the social world without being a part of it (Hammersley, M & Atkinson, P., 1983), it is important for the ethnographer to step into the research site to learn the language participants use, to understand the way participants do things, and to observe the life participants live over the research time period. That is, researchers need to attempt to be both engaged participants and coolly unemotional observers of the life of others. Therefore, this researcher employed the form of participant observation to be explicit what happened in preservice teachers’ learning experience. That is, I situated myself in a researcher-participant position (Ritchie & Rigano, 2001) to listen, observe, and ask about preservice teachers’ learning experience of electronic portfolios. As Tedlock (2000) stated that genres of ethnography is important and required for an ethnographer to enter the field, ethnographers depend on lived experience to experience and observe their own and others’ co-participation within the ethnographic scene of counter. From this point of view, this research was to present both the researcher self and preservice teachers’ stories together. That is to say, to understand, describe, and interpret other life, interpretive stance was employed. The interpretive science is the research of meaning. However, meaning must be understood under its system which is cultural meaning system. That is, to understand the meaning of human action requires an “inside” understanding (Schwandt, 2000). The researcher must grasp the situation in which human actions make or acquire meaning in order to say the researcher has an understanding of
the particular action. This research was about an understanding of preservice teachers’ learning experience with developing electronic portfolio. That is, by exploring the process of understanding whereby preservice teachers gained the knowledge of technology integration and competency of profession, the researcher interpreted preservice teachers’ learning of developing electronic portfolio as a meaningful action in order to understand the human inherently meaning of learning experience in the social world.

3.2 The researcher roles

As Ritchie & Rigano demonstrated that the positioning theory effect we see the things (2001), the way we talk and act depends upon the position we have taken from our everyday life. Different positions we take will change the way we see the world. That is, how a researcher positions him/herself or is positioned would affect the research and representation of stories. Thus, research is an interactive process shaped by the researcher’s personal history, biography, social class, race, and ethnicity (Doenzin & Lincoln, 2000).

In this research, I was influenced by my multiple roles as an elementary teacher in Taiwan, an international Ph.D. student in the Ohio State University, a technology assistant in the M.Ed. program and a participate-observer in the research. The role of an elementary teacher has drawn my attention on how technology enhances teaching and learning. An international student role inspired me to understand theory and practice of technology integration in teacher education, an insider and outsider to the research. Furthermore, as a technology assistant in M.Ed. program provided me a chanced to work with preservice teachers for developing their electronic portfolio and gained the insight of
this research. As a participant observer, I was a learner to listen, observe, and ask M.Ed. students’ stories. It enhanced me to read and interpret others’ life more depth.

3.2.1 An elementary teacher in Taiwan

My country, Taiwan, has been undergoing educational reform since the 2001 school year. The goals of Comprehensive Education Reform are to improve the learning environment, restructuring the school administration, prompting curriculum change, and taking care of disadvantaged students. Technology integration is one of eight themes to focus on for achieving educational reform goals. The Taiwan Ministry of Education indicated that technologies need to be used to integrate learning domains for helping teaching and learning. As a result, educational technology curriculum needs to be stared in the elementary educational level (Wen, 1999). For doing that, two billion US dollars had been dedicated for elementary school networking and internet access to reach the goal of 100% of the elementary schools to be networked by 2001 (Tu & Twu, 2002). However, most Taiwan teachers have received insufficient training of technology integration (Tu & Twu, 2002; Wu, 1988). As an elementary teacher in Taiwan, who quit my teaching job temporality for pursuing the Ph.D. degree in America and I eventually will go back to the teaching position, I have begun to put my interest on how technology enhance teaching and learning, and how teacher education can prepare preservice teachers’ competency of technology integration. Since I had 15 teaching experience in elementary school, it provided me a practical lens to exam what I am studying.

3.2.2 An international Ph. D. student

Technology integration in teacher education drew my attention in my doctoral program and I began to take technology courses and chose technology integration as one
of my cognate areas of study. In those technology courses, I was not only to learning how to use technology to integrate teaching and learning but also, which is more important, I studied why to use technology as a cultural tool in education. In courses such as P&L 791 Media and Technology in Education I learned FrontPage software to design the website, and how to create PowerPoint presentations, and web-based lesson plans; in P&L 860, Technology, Society and Education we examined the relationship between human and technology. All of these studies provided me a theoretical foundational for my research.

For being an international student to study in the Ohio State University within a different culture, I felt I have become a stranger, an outside who live in the social world I didn’t familiar before. My knowledge about how to act and think within the world of daily life is incoherent. I considered myself situated in a peripheral social context. I had to learn (discover) how people live in the social context in order to become a member of my social group in the OSU. By asking, observing, and listening to what and how people do things here, I realized that learning is a cultural understanding. As my experience of international student showed, learning is not solely about knowledge acquisition but also about cultural understanding. My learning took place within the cultural context in which I interacted with people around me as I listened, asked, and observed people. Therefore, I studied sociocultural theory to understand how a learner learns.

3.2.3 A technology assistant

In the school year 2002, the early childhood M.Ed. program of the OSU carried out an electronic portfolio project. Faculty sought technology assistants who had experience in teaching, were familiar with FrontPage, and had knowledge of technology integration
in education. I was selected for this position and in the 2002 autumn quarter, I started to work with the early childhood M.Ed. students as a technology assistant.

As the role of technology assistant, I scheduled computer lab clinic times for M.Ed. students to work on their electronic portfolios. I and another assistant stayed with students in the computer lab all the time and gave them suggestions and help as needed. I attended weekly leadership faculty meetings. In the meetings I listened to what was happening in the M.Ed. class and shared my work with the faculty. Sometime if students’ seminar topic was related to students’ electronic portfolios, I attended their seminars as a resource. To communicate with students, I sent emails reminding them of the computer lab time, assignment information, or technology information. I also responded to students’ email to help them work out problem as needed. In the end of each quarter, I viewed students’ website to check each quarter’s assignments and informed the program managers of students’ progress.

Through working with M.Ed. students in the computer lab, seminar classroom, and email, I understood what they do, how and why they do things there. I learned the culture of the people I studied. M.Ed. students were not strangers to me. In other words, I was not a stranger to them either. The role of assistant gave me the path to access the meaning of M.Ed. students’ learning that guided me to observe, listen, and interpret things that happened as they learned to use technology.

3.3 Research design

In the following section, I first described the Early Childhood Master of Education program in The Ohio State University as my research setting. I detailed the M.Ed. program context and the e-portfolio content to provide a scene where preservice teachers’
learning happened. Secondly, I introduced the research participants and explained why their voices were included.

3.3.1 Research setting

The College of Education in The Ohio State University offers a one-year-long teacher licensure program at the graduate level leading to a Master of Education (M.Ed.) degree in the area of Early/ Middle Childhood Education. As students complete undergraduate prerequisite courses and get permission to enter the early Childhood M.Ed. program, students are required to take four or five quarters of full-time study. When Early Childhood M.Ed. students finish a series of professional courses and fieldwork, they receive an initial Ohio pre-kindergarten through third grade license.

Since the OSU M.Ed. programs are guided by The National Council Accreditation of Teacher Education (NCATE), and the integration of technology throughout teacher preparation is one of NACTE standard (http://www.ncate.org/2000/unit_stnds_2002.pdf), beginning in 2002, the OSU Early Childhood M.Ed. program had addressed the issues of preparing preservice teachers to effectively use and seamlessly integrate technology across content areas by conducting the electronic portfolio project as M.Ed. students’ program completion requirement. The purpose of this project was intended to move to more standard-based teacher performance assessment that preservice teachers documented and organized their skills, knowledge, and dispositions in the teacher education program. That is, by evaluating students’ e-portfolios, the M.Ed. program assessed preservice teachers’ technology competency and professional development and showed graduates are qualified teachers.
Before the school year 2003 began, Early Childhood M.Ed. program coordinators met with faculty who taught in M.Ed. method courses to discuss the goal of the electronic portfolio project. Method instructors agreed to integrate the electronic portfolio into their course plan as an assignment. In the beginning of the school year 2003, the preservice teachers were required to take one single course, P&L 791 Media and Technology in Education, as a technology introductory course during the 2003 summer quarter. In the course, preservice teachers learned FrontPage to create a web-based portfolio. Moreover, preservice teachers discussed how technology integrated teaching and learning, created a PowerPoint project presentation, evaluated educational software/ websites, developed a spreadsheet project in Excel, and developed a technology-based lesson plan (see Appendix D).

As M.Ed. students created their e-portfolios, their e-portfolios were hosted in the OSU Education College server. Each website has 10 MB space and can be kept for a year after M.Ed. students’ graduate. Throughout the licensure program, as preservice took a series of method courses, they were required to upload their assignments into their e-portfolios (see Appendix E). M.Ed. students’ electronic portfolios needed to cross all content areas and included their work of reflections within the categories of Educational Philosophy and Student Teaching. Educational Philosophy contained four strands of the Integrated Teacher & Learning M.Ed. program-- Learning and Development, Equity and Diversity, Families and Communities, Constructed Curriculum. Under each of the four themes, preservice teachers were required to have their theoretical statement and two examples of assignments. In the Student Teaching section, preservice teachers documented their field experience which included Description of the Setting, Document
a Unit of Study, Document a Child, Document a Significant Community/Family/School Connection, and Final Reflection: On Becoming a Beginning Teacher (see the Appendix M).

To support M.Ed. students in developing e-portfolios, the Early Childhood M.Ed. program purchased 20 sets of digital supply kits and assigned one school staff member to supervise the check-out process. Those kits included a Fuji digital camera, a battery recharger, a 120 MG media card, a reader writer, and a zip driver. M.Ed. students were welcome to check the digital supplies out for two weeks. Six sections of computer clinics were scheduled around the OSU computer labs for each quarter (the 2003 autumn quarter, the 2004 winter quarter, and the 2004 spring quarter). M.Ed. students were welcome to come to the computer lab to work on their e-portfolios with two technology assistants.

In the summer quarter 2004, early childhood M.Ed. students took Ed T&L 925 I10 Capstone Seminar to complete their M.Ed. electronic portfolios. By the end of that quarter, the M.Ed. students’ e-portfolios were evaluated by the capstone instructors (first readers) and other faculty (second readers). Readers followed the rubric (see Appendix I) which two capstone instructors created to provide feedback and suggestions (see Appendix H) on the students’ e-portfolios. As students received the feedback from readers, they were expected to revise their works. To conclude the project, M.Ed. students presented their e-portfolios to a small group with six students and two M.Ed. faculties. In the classroom with a notebook computer and a projector, each student had twenty minutes to demonstrate their change and growth in learning using their on-line e-
portfolios. As they finished their presentations, peers and evaluators would give feedback and ask questions related to their e-portfolios.

3.3.2 Research participants

There were 60 students in The OSU Early Childhood M.Ed. program during the 2003 school year. However, thirteen of them had chosen to do an alternative diversity project as their capstone project. Those thirteen students created a group website as a showcase e-portfolio in the end of their capstone. As I decided to study preservice teachers’ learning process in developing e-portfolios throughout the school year, I eliminated these thirteen M.Ed. students, and choosing only forty-seven students who worked with me on their e-portfolios as my participants. The average age for the forty-seven students was in the 20s and all but four were women. None of them had prior experience with e-portfolios. As I worked all year with M.Ed. students, I observed their growth and change in doing the e-portfolios. The M.Ed. students’ learning of developing e-portfolio did not happen in a vacuum but within a social context. As I was a technology assistant who worked with both M.Ed. students and program faculty, I perceived that faculty made the effort to support M.Ed. students’ learning. Faculty, who taught method courses such as Pedagogy, Social Studies, Math, and Science, had a remarkable impact on M.Ed. students’ e-portfolios as e-portfolio project was integrated into their courses.

I interviewed nine early Childhood M.Ed. program faculty members who taught in the 2003 M.Ed. program to learn about their teaching experiences related to helping preservice teachers develop their e-portfolios.

3.4 Data collection method
As the ethnography’s study uses multiple data sources to provide the basis for triangulation (Hammersley, M & Atkinson, P., 1983), the data for this study were collected through four research methods: observation, survey, interviews, and document analysis. In the following, I illustrate how I conducted the study by employing each of these methods.

3.4.1 Observation

In an ethnographic study, researchers enter the study field to observe what happens. In observing people’s behavior, researchers write field notes in order to understand the actions of others. Thus, field notes are a traditional means in ethnography to collect observational data (Hammersley, M & Atkinson, P., 1983).

Working for a year with M.Ed. students as an observer and participant, I watched what happened, listened to what was said and took field notes, sometimes in the computer labs, sometimes in the seminar meeting or classroom. From observing on site, I documented what happened there, how people did things, and how they interacted with each other. The field notes (see Appendix N) included two elements. The first element is that I wrote down what I saw in the field, such as how M.Ed. students work on their e-portfolios and what problems they encountered as they worked in the computer labs, how M.Ed. students perceived and solved problems, and how instructors and students worked together on the e-portfolio development. Another element is that I wrote my comments of what I observed in terms of my understanding of people’s actions, and how I positioned myself in the research in terms of how I built relationship with others, and how I had changed the way of working with the students.
The field notes helped me to understand the nature of M.Ed. students’ learning in the field. As I became familiar with the people I worked with and the questions that I had, I narrowed my research questions to focus on: 1) what were the preservice teachers’ perceptions of learning about the e-portfolio? 2) how did the sociocultural contexts influence the preservice teachers’ e-portfolio development? 3) what did the preservice teachers learn from developing their e-portfolios that influence their technology competency? and 4) how did the preservice teachers transform their understanding and learning from the e-portfolio into their first year of teaching?

I observed in the summer capstone classroom which included three class meetings and six computer lab clinics. During the three class meetings, there was either large group or small group discussions of the students’ concerns related to the e-portfolio. Each time, I observed and took notes on how the instructor and students worked on issues toward finishing up the e-portfolios, and how peers learned from each other as they shared their ideas for developing the e-portfolios. I also observed in the computer labs to see how they worked together and how their e-portfolios were completed.

3.4.2 Survey

As Fetterman (1998) pointed out, questionnaires have their place in an ethnographic study. They are an excellent way to tackle questions dealing with representativeness. Surveys can help researchers to explore a specific concern. Research can adapt the survey to a specific topic or set of concerns. In order to understand M.Ed. students’ perception of their learning experience with developing e-portfolios in general and add additional information to the data from interviewing, I gave a survey to 47 Early Childhood M. Ed. students after they finished their e-portfolios. Elaborating from my research questions and
using the themes emerging from my observations, I designed mixed-structured questions for the survey (see Appendix G). A brief description of survey purpose was written in the beginning of the questionnaire. A recruitment letter (see Appendix C) was also sent to M.Ed. students to inform them that their comments were voluntary, that their identity would be kept confidential, and that I greatly appreciated their doing the survey for me. The questionnaire was divided into three parts. The first part collected general information from M.Ed. students. The second part dealt with students’ perspectives on the value, challenges, future, and proposed additional features of e-portfolios. The last part included three open-ended questions that asked students to give their suggestions related to e-portfolios.

I distributed the survey to the students during the fifth and sixth computer lab meetings, the last two meetings. After the capstone instructors gave a brief explanation of my intention and encouraged M.Ed. students to finish the survey, I passed out the survey. To address problems of the poor return rate (Fetterman, 1998), I participated in their computer lab and worked with them. Mostly students returned the questionnaire to me during the computer lab. However, a few students tended to focus on their portfolio work and did have time to finish them. If they could not fill out the survey before they left the computer lab, I asked them to put it in my mailbox. As a result, I received 27 surveys before they graduated. For the first follow-up to get surveys from those who did not return them, I sent email to M.Ed. students asking them to send back the survey to me by electronic file. Four students sent back their survey. Overall, I collected 31 surveys, which was 66% of 47 M.Ed. students.

3.4.3 Interview
In the survey research, the respondents answered questions without any verbal exchange or clarification. The distance between the questioner and respondent may cause “misinterpretation and misrepresentations [that] are common with questionnaires” (Fetterman, 1998, p. 64). To gain a more in-depth understanding of the general survey information, I conducted interviews with seventeen volunteer M.Ed. students, six follow up interviews with graduates whom I did interviews with, and nine M.Ed. faculty.

From Gubrium’s and Holstein’s point of view (1998), interviewers should not focus on getting answers from respondents to see them as object who posed some objective knowledge. Thus, the interviewer pays attention to the “hows” of an interview rather than the “whats” of an interview. That is, an interview is an interaction between the interviewer and interviewee. As a storytelling, interviewer and interviewee collaborate together to create a story in the process of interviewing. It is not the attempt to maintain neutrality and achieve objectivity and keep the role of interviewer as invisible as possible (Fontana, A. & Frey, J. 2000, p. 666). That is, being a qualitative researcher, I had built the relationship with my respondents. I treated them as people and respected their contribution to my study. Consequently they were willing to share their lives (stories) with me.

The semi-structured interview was conducted throughout the process. By following the protocol of interview, they were welcome to ask or add questions. Hence, the interviewees and I were flexible about following their responses and creating a more conversational atmosphere.

3.4.3.1 Interview with M.Ed. students
As M.Ed. students had a tight schedule during the last quarter and some of them would leave Columbus, Ohio. I decided to interview them before their e-portfolio presentation. Seventeen M.Ed. students volunteered to do an interview with me. Before the day of the interview, I sent the reminder and interview questions to each interviewee. My interview questions included:

1. How do you perceive your experience of developing an electronic portfolio from the beginning to the end? Is it a learning outcome (product) or a learning experience (process) to you? Did your mind change about the values of e-portfolios?
2. How did you use the e-portfolio as a tool to present your learning story (in terms of e-portfolios’ content, designing, and organization)?
3. What did you learn from developing your e-portfolio (in terms of technology skills, multimedia, knowledge of integration, and reflection)?
4. What values and interests did you share with your peers related to developing your e-portfolio?
5. What did you learn from others (instructors, supervisors, peers, mentor teachers) as you developed your e-portfolio?
6. How will the experience of developing your e-portfolio contribute to your teaching and learning (in terms of technology integration and professional competency)?
7. How do you plan to apply the knowledge and skills that you learned from developing e-portfolios into your future teaching?

While I used these questions, interviewees were encouraged to ask clarifying questions and elaborate their responses. At the beginning of the interview, I gave each interviewee a consent form (see Appendix B) to sign and asked their permission to record the interview. Each interview took around 30 minutes.

3.4.3.2 Interview with M.Ed. faculty

I conducted faculty interviews in October 2004. They were not available during the time I interviewed students. A recruitment letter (see Appendix C) and interview questions were sent to nine faculty members through email to inform them of the nature of my research. I wanted to learn about the faculty’s theory of students’ learning related
to e-portfolios, how their courses’ design related to e-portfolio, and their suggestions for
future e-portfolio projects. Questions for the faculty interview questions included:

1. What are the advantages and disadvantages of the e-portfolio in the M.Ed. program?
2. What learning activities/assignments did you integrate into your course plan to facilitate students’ development of the e-portfolio?
3. Based on question 2, what criteria did you use to assess students’ work for the e-portfolios?
4. What concerns/challenges did you find (realize) in helping students develop their e-portfolios?
5. What are your suggestions/solutions for the challenges and concern you have?
6. How do you think the project could be improved and made more meaningful?

3.4.3.3 Follow-up interview with program graduates

I used an email survey to follow up with graduates to investigate how they integrated their learning about developing e-portfolio into their teaching after they graduated. On 11/20/04 I sent emails (see Appendix B) to the 17 graduates with whom I did the first interview. At this point, the preservice teachers were three months into their first teaching position. In the email I also attached the post interview questions:

1. How have you maintained (updated) your e-portfolio or continue to use it as a tool for your professional growth? (please explain how and why)
2. If you were going to update your e-portfolio today, do you remember how to do it?
3. How did your e-portfolio learning experience facilitate your first year teaching?
4. What part of your e-portfolio did you implement into your first year teaching?
5. What technology skills are you using in your teaching?
6. Based on question 5, which of those skills did you develop/learn while working on the e-portfolio?
7. What technology environment/resources/support do you have in your classroom (school)?
8. Are there any expectations from your department chair, principal, or district to integrate technology into your teaching?
9. Do you plan to ever use an e-portfolios (or portfolios of any kind) with your own students?
10. Now that you are a teacher, would you have any suggestions about how to better implement e-portfolios in the teacher preparation program at OSU?
Three follow-up emails were sent out within a month to try to increase the number of more participants. I received six first year teachers’ responses to the post interview voluntarily. During their Christmas break, I met with them in coffee shops to talk further. At the end of 2004, I finished four face-to-face individual interviews and two interview responses through email since two graduates teach in other cities (11/22/04 and 12/30/04).

### 3.4.4 Document analysis

Bloch (1991) argued that practical knowledge is different from linguistic knowledge. Linguistic knowledge is organized in the mind. However, practical knowledge is involved at the level of implicit taken-for-granted skill or know-how (cited in the Hodder, 2000, p. 708). That is, people questioned about “what people say” is often very different from “what people do”. Thus a full sociological analysis cannot be restricted to interview data but should include document analysis (Hodder, 2000, p.705).

Document analysis is a way to increase the credibility of data. The e-portfolio of M.Ed. students is a product in which they practice technology in a meaning way. In e-portfolios, M.Ed. students showed their technology skills and how they integrate technology into their learning. Therefore, tracing M.Ed. students’ e-portfolios as documents helped me examine how M.Ed. students took theory into practice. As I read students’ interview and survey response, sometime I also viewed their e-portfolios as it was needed. Viewing artifacts they collected and reflections they wrote was concrete evidence to help me to explore multiple and conflicting voices, differing and interacting interpretations.

### 3.5 Data analysis
I received 66% survey responses from M.Ed. students. I divided the survey data into three parts. The first part of the survey was used to describe M.Ed. student demographic information. The second part incorporated 33 mixed survey questions related to their perspectives on the e-portfolios in general. Survey questions 1 to 24 were five scaled questions. Survey questions 25 to 29 were rank order questions asking for their three highest choices from a list. To calculate these responses, I assigned a weight of 3, 2, and 1 for their highest, next highest and third highest choices (see example in Appendix N). I used my research questions to analyze the second part of survey data. The first theme was related to preservice teachers’ understandings of the e-portfolios (what); the second theme was the social engagement of supporting preservice teachers to develop e-portfolios; the third theme was students’ development of e-portfolios.

The third part of the survey included three open-ended questions related to their opinions of how they planned to use the e-portfolio that they created in the program (survey question 34), and what suggestions they would give to future students and the M.Ed. program for developing a successful e-portfolio (survey questions 35, and 36). Based on their experience with developing e-portfolio, their plans were analyzed to describe their potential use of the e-portfolio; their suggestions were used to understand the social engagement in which they created their portfolio and to think about suggestions for program changes.

As there are only 27 out of 31 survey participants who responded to the open-ended questions, I used 27 as the N (number of participants). Following each opened-end question, I created a table to analyze the M.Ed. students’ suggestions by coding respondents’ suggestions using percentages to indicate the number of responses related to
total number of responses. Some respondents gave several suggestions to the opened-end questions. For example, S1 had two plans for using her e-portfolio in the future. Thus, the total of the percentages to each question does not equal 100% (see table 4.10).

The interview data analysis drew on 32 interviews (17 preservice teachers, 9 faculty, and six graduates) by grouping the responses into categories related to the three research questions: preservice teachers’ perception of e-portfolios, how sociocultural context influences preservice teachers’ learning of e-portfolios, and what preservice teachers learned and transformed during their learning of e-portfolios. Following each research question, several key themes emerged from the interviewee responses. The survey data, observation notes, and M.Ed. students’ e-portfolios were integrated into the three research questions and sub-themes to support and triangulate the interview data analysis.

3.6 Trustworthiness

Establishing trustworthiness of the data and interpretations, according to Lincoln and Guba(1985), requires prolonged engagement, persistent observation, triangulation, peer review and debriefing, member checking, and rich descriptions. Following those criteria, I address how I maintained my research trustworthiness:

1. Prolonged engagement and persistent observation: As Glesen (1999) has argued, time is a major factor in the acquisition of trustworthy data. The prolonged engagement provides scope of research; the persistent observation provides depth of research. As a tech assistant in the program for a year, I spent time in the lab working with the M.Ed. students, responding M.Ed. students’ email, and observing in their courses. From the large amount of time I spent
with my research participants, I had the opportunity to build relationships with
the M.Ed. students and to know the program purposes well.

2. Triangulation of data collection: A qualitative research is multi-method and
involves an interpretative and naturalistic approach to the subject matter of the
study. In this research, I used survey, observations, interviews, and document
analysis as multiple methods to collect data. As a result, my research did not
rely on a single resource but used multiple sources of data to create an in-depth
understand of the research questions. Moreover, I included different voices,
both M.Ed. students’ and faculty to collect their different points of view. This
helped me to interpret the story from different angles.

3. Peer debriefing: To have external opinions and input into my study, I discussed
my research design and data analysis with my friends and classmates, Chien-
Hua Kuo, and Chien-Ni Change, who both are doctoral candidates at the OSU.
As their dissertations are different areas, they provided an outsider’s viewpoint
to my study.

4. Thick description: Thick description makes thick interpretation possible
(Janesick, 2000, p. 391). In this research, I provided rich descriptions of the
research context, research site, participants, and the methods of data collection.
My description allows readers to enter my study context in order to understand
when my research happened, what happened in my research, and how my
research was conducted.
CHAPTER 4

DATA ANALYSIS

This chapter has two parts. The first provides some background on the research context to describe the OSU M.Ed. program and the preservice teachers’ demographic information. The second part provides the analyses of the survey, interview data, and the observation notes related to the four research questions: the preservice teachers’ perception of e-portfolio, the influences of sociocultural context for preservice teachers’ learning of e-portfolios, the preservice teachers’ development of learning of e-portfolios, and the six program graduates’ transformation of learning of e-portfolios.

4.1 The OSU M.Ed. program context

The M.Ed. licensure program at The Ohio State University is a 5-quarter program. Table 4.1 shows the program arranged by each quarter’s activities related to the e-portfolio:
<table>
<thead>
<tr>
<th>2003 Summer Quarter</th>
<th>Tasks</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum</td>
<td>P&amp;L 791, Pedagogy</td>
<td>Finished educational philosophy statement</td>
</tr>
<tr>
<td>Supplies</td>
<td>not already</td>
<td></td>
</tr>
<tr>
<td>Computer Clinics</td>
<td>6/24/03-7/22/03 every Tuesday and Thursday, 3:00 to 5:30 pm, work in the technology lab</td>
<td>Assignments required for P&amp;L 791 technology course</td>
</tr>
<tr>
<td>Assignments for the e-portfolio</td>
<td>Developed interface of e-portfolio</td>
<td>Finished the navigation structure and published it on the education school’s server</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2003 Autumn Quarter</th>
<th>Tasks</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum</td>
<td>Social study</td>
<td>One student checked out one set</td>
</tr>
<tr>
<td>Supplies</td>
<td>20 sets of digital supplies located in the Arps Hall 015 were available for checking out</td>
<td></td>
</tr>
<tr>
<td>Computer Clinics</td>
<td>Met 8 times in Stillman Hall 145—computer lab 9/30 4:00-6:00 pm 10/07 4:00-6:00 pm 11/07 4:00-6:00 pm 11/04 4:00-6:00 pm 11/21 4:00-6:00 pm 11/18 4:00-6:00 pm 11/21 4:00-6:00 pm 12/02 4:00-6:00 pm</td>
<td>Reset password and username as the website moved to another server. 8 students came to lab on 12/02. Sent email to students after the computer clinic to share information. (see Appendix J)</td>
</tr>
<tr>
<td>Assignments for the e-portfolio</td>
<td>Created a navigation structure, uploaded the pedagogical statement, uploaded one assignment from social studies method course</td>
<td>Gave the e-portfolio handout to M.Ed. students (see Appendix E). Assignments reminder letter was sent to students on 11/30/03 (see Appendix K)</td>
</tr>
</tbody>
</table>

Table 4.1 The M.Ed. program context of e-portfolio
### 2004 Winter Quarter

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum</td>
<td>Passed out the handout of internet permission and last year’s e-portfolio rubric. Invited a guest speaker to introduce how to use digital cameras to document classrooms</td>
</tr>
<tr>
<td>Supplies</td>
<td>One set checked out</td>
</tr>
<tr>
<td>Computer Clinics</td>
<td>10 student (01/20)</td>
</tr>
<tr>
<td>Assignments for the e-portfolio</td>
<td>6 students (01/27)</td>
</tr>
<tr>
<td></td>
<td>4 students on 02/24/04</td>
</tr>
<tr>
<td></td>
<td>4 students on 03/02/04</td>
</tr>
<tr>
<td>supplied</td>
<td></td>
</tr>
<tr>
<td>19 sets of digital supplies</td>
<td></td>
</tr>
<tr>
<td>6 times in Stillman Hall 145—computer lab</td>
<td></td>
</tr>
<tr>
<td>01/20 4:00-6:00pm 01/27 4:00-6:00pm 02/10 4:00-6:00pm 02/24 4:00-6:00pm 03/02 4:00-6:00pm 03/09 4:00-6:00pm</td>
<td></td>
</tr>
<tr>
<td>Assignments for the e-portfolio</td>
<td>Assignments reminder letter was sent out on 3/19/04 (see Appendix L)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>uploaded assignments from science, mathematics, and diversity and equity.</td>
<td></td>
</tr>
<tr>
<td>practicing digital photo and scanning documents</td>
<td></td>
</tr>
</tbody>
</table>

### 2004 Spring Quarter

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum</td>
<td>Documenting student teaching</td>
</tr>
<tr>
<td>Supplies</td>
<td>Two sets checked out</td>
</tr>
<tr>
<td>Computer Clinics</td>
<td>5/27 one student came to lab to ask how to upload pictures into the e-portfolio</td>
</tr>
<tr>
<td>Assignments for the e-portfolio</td>
<td>Handed out the description of student teaching documentation (see Appendix M)</td>
</tr>
<tr>
<td>supplied</td>
<td></td>
</tr>
<tr>
<td>18 sets of digital supplies</td>
<td></td>
</tr>
<tr>
<td>Building/ Room: Brown Hall 145—computer lab</td>
<td></td>
</tr>
<tr>
<td>05/25 4:30-6:59pm 05/27 4:30-6:59 pm 06/01 4:30-6:59pm 06/03 4:30-6:59 pm 06/08 4:30-6:59pm 06/10 4:30-6:59 pm</td>
<td></td>
</tr>
<tr>
<td>Assignments for the e-portfolio</td>
<td></td>
</tr>
</tbody>
</table>

Continued
Table 4.1 continued

<table>
<thead>
<tr>
<th>2004 Summer Quarter</th>
<th>Tasks</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum</td>
<td>M.Ed. Capstone Seminar, Families and Communities course</td>
<td>Discussed/distributed “e-portfolio rubric” to students (see Appendix I)</td>
</tr>
<tr>
<td>Supplies</td>
<td>20 sets of digital supplies</td>
<td>Two boxes were returned Requirement for capstone class. Students had come to lab at least three times</td>
</tr>
<tr>
<td>Computer Clinics</td>
<td>6/28, 6/30, 7/7, 7/12, 7/14, 7/19 six times capstone class met at computer lab from 2:00-4:18 pm</td>
<td>7/14 all e-portfolio assignments were completed and sent to capstone instructors and second readers</td>
</tr>
<tr>
<td>Assignments for the e-portfolio</td>
<td>Uploaded the content and documentation from student teaching</td>
<td>7/14 students presented their e-portfolio within a small group</td>
</tr>
<tr>
<td></td>
<td>Uploaded final reflective pieces</td>
<td>Feedback was sent to students from the capstone instructor and the second reader before the conference</td>
</tr>
<tr>
<td></td>
<td>Polished the e-portfolio</td>
<td>7/21-- Preservice teachers presented their e-portfolio to students and faculty at a final conference</td>
</tr>
</tbody>
</table>

4.2 The preservice teachers’ demographic information

As the data shown in table 4.2 indicates, thirty seven of the M.Ed. preservice teachers were in their 20s. There were only 4 out of 31 who were over 30. They all had PC computers with Microsoft Word at home. Ninety percent had internet access. Based on preservice teachers’ average age and technology environment, it is likely that the computer was a common tool for the M.Ed. students. As one of the preservice teachers,
Vinita pointed out that they grew up in the computer age in the follow-up interview; she said “I think in this same age as me that most people who came out of college with a master’s degree know how to use computers. You could not get through without it (interview data 01/19)”. It was common that they used computers in their student lives to send email, research websites, and type papers. Despite their familiarity with computers, all of the participants responded they did not have prior experience with e-portfolios. It meant that they did not have any prior knowledge of e-portfolios; they were not familiar with using multimedia to develop e-portfolios before they entered the program.

<table>
<thead>
<tr>
<th>Age</th>
<th>20s</th>
<th>30s above</th>
<th>100%</th>
<th>(87%)</th>
<th>(13%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>28</td>
<td>(90%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>3</td>
<td>(10%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior experience with e-portfolio</td>
<td>None</td>
<td>31</td>
<td>(100%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>0</td>
<td>(0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware/software they had at home</td>
<td>Computer</td>
<td>31</td>
<td>(100%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scanner</td>
<td>11</td>
<td>(35%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital camera</td>
<td>17</td>
<td>(55%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FrontPage software</td>
<td>25</td>
<td>(81%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internet access</td>
<td>28</td>
<td>(90%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2 The M.Ed. preservice teachers’ general information

4.3 The preservice teachers’ perceptions of the e-portfolio

The survey and interview data indicated that the preservice teachers perceived the learning from the e-portfolio as a process of learning with varied outcomes. They described the e-portfolio as a process of learning technology, an assignment, a
documentation, a source of reflection, and as a mean to share their learning, as shown on table 4.3.

<table>
<thead>
<tr>
<th>Data Themes</th>
<th>Survey</th>
<th>17 preservice teachers interviews</th>
<th>9 faculty interviews</th>
<th>6 follow-up interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process of learning technology</td>
<td>Q27</td>
<td>12 (+) 5(-)</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Assignments</td>
<td>Q1, Q25</td>
<td>17 (+)</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Documentation</td>
<td>Q21, Q22, Q25</td>
<td>5(+) 2(-)</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Reflection</td>
<td>Q25, Q24, Q19</td>
<td>6 (+) 3(-)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Sharing learning</td>
<td>Q5, Q10, Q23, Q33</td>
<td>6 (+) 3(-)</td>
<td>1</td>
<td>2 (+)</td>
</tr>
</tbody>
</table>

Table 4.3: Summary of preservice teachers’ perception of e-portfolios
* + means they indicated either agreed or strongly agreed; – means they indicated disagreed or strong disagreed.

In the survey data, table 4.4 shows the preservice teachers’ perception of an e-portfolio. The percentages for the responses in this category indicate that preservice teachers were aware that the e-portfolio was a requirement (68% strongly agree and 19% agreed), and 81% preservice teachers strongly agreed and agreed that they were proud of their work in the e-portfolio after it was finished. They reported (48% strongly agree and 42% agree) that they felt ownership of their e-portfolio. The data also show that preservice teachers indicated that the e-portfolios helped them to see their growth and changes throughout the year (10% strongly agree and 45% agree) and that it presented their best capabilities as a beginning teacher (23% strongly agree and 29% agree). For these preservice teachers, developing the e-portfolio helped them to become reflective thinkers (23% strongly and 34% agree), and supported their growth toward becoming
more willing to share their learning experiences with others (26% strongly agree and 45% agree).

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Strongly agree (%)</th>
<th>Agree (%)</th>
<th>Undecided (%)</th>
<th>disagree (%)</th>
<th>Strongly disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. I was aware that the electronic portfolio was a requirement of program completion at the beginning of the school year.</td>
<td>68%</td>
<td>19%</td>
<td>0%</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td>Q5. I was proud of my work of e-portfolio.</td>
<td>45%</td>
<td>36%</td>
<td>13%</td>
<td>0%</td>
<td>6%</td>
</tr>
<tr>
<td>Q10. I feel ownership of my e-portfolio.</td>
<td>48%</td>
<td>42%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Q21. The e-portfolio helped me to see my change throughout the whole school year.</td>
<td>10%</td>
<td>45%</td>
<td>16%</td>
<td>29%</td>
<td>3%</td>
</tr>
<tr>
<td>Q22. The e-portfolio presents my best capabilities as a beginning teacher.</td>
<td>23%</td>
<td>29%</td>
<td>16%</td>
<td>29%</td>
<td>3%</td>
</tr>
<tr>
<td>Q23. The e-portfolio helped me to be open-minded to share my learning experience with others.</td>
<td>26%</td>
<td>45%</td>
<td>23%</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>Q24. The e-portfolio helped me to become a reflective thinker.</td>
<td>23%</td>
<td>34%</td>
<td>10%</td>
<td>23%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 4.4: Percentage of preservice teachers’ perception of e-portfolios

In responding to survey question 25, the preservice teachers chose three items as the most important purposes for developing their e-portfolios: “complete the M.Ed. requirements,” “document/collect my learning experience,” and “self-reflect upon my
teaching and learning” (see figure 4.1). These results concur with the data shown in table 4.4.

![Bar Chart](chart.png)

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A= show my growth and change  B= document/collect my learning experience  
C= self-reflect upon my teaching and learning  D= present in a job interview  
E= complete the M.Ed. requirements  F= show my technology competency  G= other

Figure 4.1: The most important purposes for developing e-portfolios (Q 25)

In responding to question 27, the preservice teachers chose three most important advantages of the e-portfolio as “learning about technology,” “presenting my learning through multiple paths,” and “sharing my learning with others” (see figure 4.2).

Figure 4.3 indicates the percentage of people with whom the preservice teachers shared their e-portfolios (Q 33). Preservice teachers reported that they shared their e-portfolios with instructors (100%), peers (84%), family (77%), and friends (71%) most.
The survey data shown in figures 4.1, 4.2 and 4.3 indicate clearly that the e-portfolio played an important role in the preservice teachers’ learning during the M.Ed. program. The data indicate that the e-portfolio as a requirement for the M.Ed. program helped them to demonstrate that they were capable beginning teachers and that they learned about technology. It also was a documentation that these preservice teachers used the e-portfolio to demonstrate what they learned throughout the program. Moreover, it was the reflection required to create the e-portfolio that helped these preservice teachers see their change and growth throughout the year. The data also indicated that the e-portfolio was a tool that these preservice teachers used to share their learning experiences with others.

![Bar chart](image)

A= **learning about technology**  B= showing the qualification of teaching and learning  
C= **presenting my learning through multiple paths**  
D= **sharing my learning with others**  E= portable and easy to update  
F= more powerful and convenient than a traditional portfolio (paper-based)  
G= convenient way to track learning, change, and growth  H= useful tool/assessment approach in my future teaching  
I= helpful presentation in job interviews  J=other

Figure 4.2: Three most important advantages for developing the e-portfolio (Q27)
During the interview, the preservice teachers were asked to describe their perceptions of e-portfolios as a process of learning technology. The analysis of the data indicated that these preservice teachers described their perceptions within five categories: the e-portfolio as a process of learning of technology, an assignment, as a reflection, as a documentation tool, and as a way to share learning. The data indicate that these five themes were interactive and related.

### 4.3.1 Process of learning technology

“I think it [e-portfolio] is a process because in the process I learned a lot about the technology and ways to integrate technology in the classroom”.

In the survey data, the students indicated that “learning about the technology” was the most important consequence of developing the e-portfolio (see figure 4.2). The nine...
faculty persons in the M.Ed. program were interviewed about their perspectives about the
goals of the e-portfolio, all of them believed that one of goals for the program related to
the e-portfolio project was to provide opportunities for the preservice teachers to develop
their technology competency. As Dr. Oliver pointed out:

I think one goal is that students have proficiency with particular kinds of
 technological skills. So we want them to be able to post to a website and to know
how to do particular kind of things.

And Dr. Rodger’s opinion of the goal of the teacher education program e-portfolio was:

Students just through interactions with that kind of technology, the development of
their e-portfolio, and familiarity with the website grow increasingly comfortable
with using technology.

That is, in the process of developing an e-portfolio, the program faculty expected their
preservice teachers to acquire technology skills and knowledge. In order to finish their e-
portfolios, the preservice teachers had built up some levels of proficiency with
technology skills, such as creating a web page interface, making hyper linking, uploading
file and pictures. That is, the M.Ed. students had learned various technological skills first,
as a consequence, and they could employ the skills to develop their e-portfolios.

Twelve out of 17 interviewees reported that the e-portfolio was a learning process
because they had to learn technology skills such as using educational software, taking
digital photos, creating a webpage, and documenting teaching and learning while doing
their e-portfolios. To them, the learning of e-portfolio was not something that could
happen within one night but rather they had learned those technology skills and
knowledge piece by piece, step by step. Beth described her learning experience of e-
portfolio in this way:

At first I hadn’t an idea how to make a web page or how to do any of the things
other than create a word document, and then now I feel like, not a master but I feel
like I understand how to make a website and how to link things and how to put on a picture and scan just the broad picture…. it is like a process because you just learn pieces of it at a time.

For Beth, she built her e-portfolio by learning lots of individual technology pieces that she needed to use. Basically she was always trying and learning with technology. Mike also demonstrated this learning of technology in the process of developing e-portfolios in saying:

It’s basically a helpful tool…by doing the portfolio, more than anything, it taught me how to use technology, build a website, and use the internet. It basically gave me another tool/resource I could use to be prosperous.

For Mike, he learned “how to use technology” in the development of his e-portfolio. It was a learning process. Similar to Mike, Miki described the e-portfolio in saying “It [e-portfolio] was a process because I started out by not knowing much and then I think this summer, last summer when we had that technology course that pulled me through, you know, the process began.”

Betty described doing the e-portfolio as a learning process that helped her learn about how to integrate technology into her teaching. She said:

I think it [e-portfolio] is a process because in the process I learned a lot about the technology and ways to integrate technology in the classroom with the students with PowerPoint presentations or if we could do websites together or laptop computers and I was learning ways - because I didn’t really understand that before. So I was learning how I could teach that to kids and at the same time and I was learning to put my ideas and beliefs about teaching together.

For Betty, the learning of e-portfolio was not only a learning of technology skills but also a learning about technology integration knowledge. Before doing the e-portfolio, she did not understand how to integrate technology into educational practice. However, through developing the e-portfolio, she was able to incorporate the technology skills into her classroom
4.3.2 A requirement (assignment)

“*It was a requirement for the master program and I was gonna to do it and meet the expectation.*”

As the data showed in the survey question 1 (see table 4.4), 87% preservice teachers strongly agreed and agreed that the e-portfolio was a requirement of the program, and to complete the M.Ed. requirement was the most important purpose of developing their e-portfolio in survey question 25 (see figure 4.1).

As twelve preservice teachers viewed e-portfolios both a learning process and a learning product, however, in the interview, five preservice teachers indicated that the e-portfolio was just a product. They did not agree that the e-portfolio was a learning process since the e-portfolio did not carry over through the whole year. They felt that there was a time demanding pressure to finish the e-portfolio. They did not see it as a meaningful learning process. Therefore, they viewed the e-portfolio as just a requirement, and an assignment from the program.

4.3.2.1 An assignment that was nothing new

“*It wasn’t anything new. Like when we had to create the PowerPoint last summer and it was kind of boring...I think it was more of a learning outcome because it was just putting everything together from the year.*”

One preservice teacher, Darcy, who had advanced technology skills, did not feel it was a learning process either. Most preservice teachers valued the developing e-portfolio as a way to learn technology skills. However, Darcy had those skills before so she did not learn many new technology things while doing the e-portfolio. Moreover, she finished the e-portfolio so fast; she questioned how much she could assimilate from the learning. As a result, developing the e-portfolio was just to put the things all together, then she could
look at it to know what she learned throughout the year. She described her experience of
e-portfolio by saying:

I already really knew how to do - like Excel, Power Point, uploading pictures and
stuff like that. I already knew how to do so - I just really learned how to make a
webpage by using Front Page so - It wasn’t anything new. Like when we had to
create the power point last summer and it was kind of boring…. I think it was more
of a learning outcome because it was just putting everything together from the year.
I don’t feel like I really learned from doing it but it just taught me to put all my stuff
together and look at what I learned over the year….we did it so fast I don’t know
how much I got out of it.

4.3.2.2 An assignment that was finished in a short period

“I just feel that we’re just trying to shove our whole year’s learning into these past three
weeks.”

Four students felt the e-portfolio was solely an outcome to be completed. They were
required to do it for the master program. Like Vinita said “To me, it is an assignment and
I completed it because I have to graduate.” Katy admitted that she learned technology.
However, she finished it with such a rush and pressure. She did not think the e-portfolio
was a meaningful learning process. Katy said:

I felt it was a requirement for the master program and I was gonna do it and meet the
expectation. Although I felt I did learn some technologies, the fact I had to do so
much writing and such quickly. I thought the process was not meaningful for me.

Similar to Katy and Vinita, Chad demonstrated that he only worked on the e-portfolio in
the beginning and the end of the program. It was two quarters’ assignments and he did
not feel that it showed what he had been through throughout the year. He said:

I think in the beginning I thought about things, the lay out, and not really what
happened in the middle and then the end. I think it was a big strength in the
beginning and the end. …It [the e-portfolio] is more like an outcome for me. It was
just something that illustrates what I learned, not really… it was more showing what
I learned rather than the learning I went through it.
From Chad’s point of view, he did not work on developing e-portfolio throughout the year. The e-portfolio only showed some periods of his learning. Hence, the e-portfolio was not a learning process for him.

Another preservice teacher, Jane, also indicated that she was focused more on getting the e-portfolio finished than having a quality experience. She was not very technologically advanced so she spent a lot of time dealing with technology skill problems. Then, she felt a lot of pressure to finish it on time. She thought if she could work on the e-portfolio throughout the whole year, she might not be so frustrated with it and it would have been a better quality product. However, in fact, she was a little disappointed with the whole project. She declared:

> I think the whole e-portfolio should have been something that we worked on throughout the year, not just at the very, very beginning and the very, very end. So I was a little disappointed with the whole project. I felt like it was more of a product than a process……I just feel that we’re just trying to shove our whole year’s learning into these past three weeks.

Jane stated that the e-portfolio should show her whole year learning outcome. However, it was not proper to gather the whole year’s learning within three weeks.

### 4.3.3 The Documentation

“It just shows where I started, where I was in the middle, where I am at the end….I think it’s a great way of documenting all my experiences.”

According to Campbell et al’s point of view (2004), a portfolio is an organized, structured, goal–driven documentation which is fulfilled with the evidence of teachers’ professional growth and achievement. As the data from the survey indicated, “document/collect my learning experience” was ranked as the second most important purpose for developing the preservice teachers’ e-portfolios (see figure 4.1), 55% of the preservice teachers strongly agreed and agreed that the e-portfolio helped them see their
changes throughout the whole year; 57% of the preservice teachers strongly agreed and agreed that the e-portfolio presented their best capabilities as a beginning teacher (see table 4.4).

During the faculty interview, nine of the program’s faculty persons agreed that an important goal of the e-portfolio for the teacher education program was to help the preservice teachers document their learning experiences and to see their changes and growth throughout the year. The documentation makes the learning visible as one professor indicated during the faculty interview:

One goal of trying portfolios is to have a place for students to collect their best work during their program………e-portfolio is a way to collect electronical artifacts and to take - and to pick those that you feel are representative of your best work in your program and not just your best work, but also show development around particular ideas, around diversity, around classroom management. It could be around lesson plan development to show how you evolved and changed. I think an important part of being a teacher is being able to make those changes and make those assessments. This is a way to document that.

For this instructor, the e-portfolio was a way to document that the preservice teachers were able to collect their best work to show how they changed throughout the program.

During the interview, five preservice teachers responded that the e-portfolio was a great way to document their learning experiences in the teacher education program as Anna stated “I put together what the examples, pictures as well as theoretical work for my classes in my e-portfolio. So it was kind of - it was documentation of my growth over the year.” Those five preservice teacher perceived the e-portfolio could document their courses work and their learning process in the program.

The e-portfolio contained the work from their courses, their classroom observations, and their student teaching. It might include a piece of a lesson plan, an image of students’ writing, a photo of the teacher and students working together, or a statement of their
educational philosophy. The artifacts that the preservice teachers collected for
documentation were what they considered their best works. For example, Beth talked
about how the e-portfolio helped her to document the whole year’s learning experiences.

She said:

Looking at it [e-portfolio], I am like “wow, look at all the things I’ve done this
year.” I mean it has been a busy year and now I see why at the end of the year and I
can see all the things I’ve done and look at it all differently….It [e-portfolio]
definitely helped me look at everything I’ve done and look back at my assignments
and look back at my teaching and it really helped me see how much I grew. Since
last year like I didn’t have such a background and I didn’t have anything to support
it and I didn’t like in teaching, I am not sure I was strong enough, and now I’ve
really grown into a much bigger teacher.

Other preservice teachers, Christina and Emily, also indicated that the e-portfolio
documented where they began in the program, what they had been through the program,
and where they were in the end of program. Christina said:

It just shows where I started, where I was in the middle, where I am at the end….I
think it’s a great way of documenting all my experiences. Show my growth and my
teaching philosophy. My student teaching experience and just shows what kind of
teacher I’ve become. What kind of teacher I want to be.

Form Christina’s point of view, she could show her growth as a professional. Her
learning about teaching and learning had become visible to her. From documenting
student teaching, she understood what kind of teacher she had become and she wanted to
become. From Beth, Emily, and Christina’s point of view, the e-portfolio was a way of
knowing, knowing about their learning in the program.

4.3.3.1 Caution of documenting or showcase e-portfolio

“I don’t think actual pieces in the portfolio really showed my growth. It shows how I am
now.”
Slightly different from Beth and Christina, Darcy and Ella agreed that the e-portfolio was the way to document their change and growth but with some cautions. Darcy did not believe that it showed how much she could do as a teacher yet. She said:

Using the electronic portfolio was fine to show my changes because I kept stuff from the beginning and redid stuff clear at the end. So I was able to show my change very easily… I think it does [show my change and growth] but I don’t think it shows enough of me as a teacher for someone to like decide whether I’m a good teacher or not. They can see stuff I did but if they’re not seeing me teach like directly I don’t know what kind of opinions they would get about me.

Ella argued that the e-portfolio only showed some parts of her learning, and mostly her student teaching in the spring quarter. It only showed where she was and how she felt when the program ended. She said:

A lot of course assignments - I haven’t had a chance to look at them over the whole year. So I’m pulling out things from my file and I’m like, oh yeah, I remember doing that. There’s just so much like I had forgotten something I had done. And doing this I remembered a lot of it …. So I think like it was showing my growth. Yes, it shows my growth and I can talk about it but there’s not really like - if I looked at my website, I don’t see a lot of stuff at the beginning of the year. Like autumn quarter because that was an observation quarter. . . . I look at it; it’s spring quarter for the most part. Like how I ended and how I feel now.

Similar to Ella, Sandy questioned that she used the e-portfolio to document her learning experience. She looked through her year’s work and could understand how she ended up having her beliefs but she did not think that other people could identify her growth through reading her e-portfolio, since her e-portfolio did not catch every quarter’s learning. She stated “I don’t think actual pieces in the portfolio really showed my growth. It shows how I am now.” Sandy stated that every piece she uploaded into the e-portfolio was her final thought. She was even not sure that she would put the first quarter works (writing) on her website because those writings were her beginning practice. She felt she had changed and grown a lot but did not feel comfortable to show her beginning learning
in the e-portfolio. She rewrote course assignments and uploaded them into her e-portfolio. As the result, her portfolio became a showcase portfolio rather than a documentation of learning.

4.3.4 Reflection

“It [e-portfolio] made us put it [our learning] to written words and think about ourselves, what we’ve learned in all our experiences and put it into one project. So we can go back and look at it again and even go further to look even deeper.”

Reflection is one of the important competencies required in a portfolio (Paulson et al, 1991; Bullock & Hawk, 2001). According to Barrette (2000), without reflection, the e-portfolio is just a scrapbook or multimedia presentation. Thus, reflection is an essential element in e-portfolio development.

In the survey data, the preservice teachers ranked the “self-reflect upon my teaching and learning” as one of three most important purposes for developing their e-portfolios (see figure 4.1). Seventy-four percent of the preservice teachers strongly agreed and agreed that the e-portfolio helped them to reflect on their learning experiences; it also showed that preservice teachers strongly agreed (23%) and agreed (34%) that the e-portfolio helped them to become a reflective thinker.

During the faculty interview, Dr. Hart claimed that along with documentation and technology integration, reflection was another important goal for the e-portfolio. She said:

The chance to reflect upon learning that was constructed under the program and come back to visit the web and deeper revisiting and reflecting…In the e-portfolio they can sometimes go back to something they have constructed early in the fall and then ideally they are able to say, look at this now, all of experience past they had and link them to now.
Another faculty member, Dr. Rodger, also emphasized reflection during the faculty interview. She said:

From a teacher education perspective, a goal might be that it would allow them to synthesize and begin to reflect critically on the kind of growth and progress that they had made around the goals of our program and to provide a vehicle to represent a community that reflected synthesis.

From both faculty persons’ points of view the e-portfolio could bring the preservice teachers to look back at what they had learned throughout the program and reexamine deeply their learning. During the preservice teachers’ interview, there were six preservice teachers who reported that the e-portfolio process promoted reflection that helped them to examine what they had learned, what they believed, how they changed, and what they can do better in the future.

4.3.4.1 Reflect back what they learned

“It really helped me reflect because you forget how much you learned till you really think back from the summer.”

Without the e-portfolio, six preservice teachers believed that their learning experience would be different. They might have put away the papers/assignments that they wrote in the program and would have not gone back to read them again. For example, Mike said:

It definitely is reflection, you know, a lot of the parts from the website is more like scholarly work, like research, and stuff like my educational philosophy, like my views so I will need a lot of searching back. That gave me the opportunity to really explain where I was coming from….[if we did not have e-portfolios] The paper would be gone. . . it [e-portfolio] really does help to solidify it in my mind. It helps me bring my learning back so that I could look what I learned.

That is, if he did not have the e-portfolio to encourage him to reflect, he might have forgotten how much he had learned. Rachel, another preservice teacher, described her reflection on the e-portfolio as helping her come to know herself better. She pointed out
that with the e-portfolio she could look at her learning again and again and even go
deeper to watch her growth because the e-portfolio documented her learning process.

Rachel said:

It [e-portfolio] made us put it into written words and think about ourselves, what
we’ve learned in all our experiences and put it into one project, so we can go back
and look at it again and even go further to look even deeper… I know what I thought
in the beginning when I walked in. Now I know what I feel at the end of it. So put
this all together and this is where I make a whole learning. This is where I’ve come.
This is who I am now.

As Rachel’s learning experience been written by words and put it up to her e-portfolio,
she got the chance to re-think and re-examine the coursework she had done before. She
came to understand herself better. Rachel provided an example by explaining:

Like the statement I had - we had one paper that we had to write way back in the
beginning of the summer, my learning and development. I changed that whole thing
for the portfolio. So that’s how much it’s changed within one year… Now I have
that on the website and so comparing and contrasting. So yeah, I learned a lot about
myself through it.

Rachel reread the paper related to Learning and Development she wrote one year ago and
recognized she had developed different beliefs and understandings. Similar to Rachel,
Christina also believed that the e-portfolio helped her to see her development. Looking
back for her portfolio, she realized that she had a different educational philosophy. She
changed and rewrote the statement of her educational philosophy that she wrote in the
first quarter totally for her e-portfolio. She said:

It really helped me reflect because you forget how much you learned till you really
think back from the summer. Because coming in I am not in an education major, a
psychology major, so I started from zero and then when I think back - like yeah, I’ve
really did learn a lot, you know, just looking at my first statement of educational
philosophy. I looked at I like unh… so I changed the whole website and completely
rewrote it.

From reflecting upon her e-portfolio, Christina was aware of her growing in education.
Another preservice teacher, Darcy, illustrated how her beliefs documented in her “Learning and Development” paper had changed when she did her writing for the e-portfolios. She said “Yeah, like my learning and development theoretical statement is totally different than the beginning.” From reflecting on the e-portfolio, she could identify her change as Rachel and Christina did.

4.3.4.2 Reflect back what they can do better in future practice

“When I look back and see what I have done. See what ways I can change it and how I can do better.”

As some preservice teachers reflected upon their learning, some not only saw their growth and change but also thought about what they could do better in the future. For example, Jane pointed out that because the e-portfolio organized her thoughts about her teaching philosophy, it helped her to see what she had done and how she had changed. More important, it provided her a chance to rethink how she can do better in the future. She said:

I think so [the e-portfolio can help her to reflect on her learning] because I think it forces us to actually sit down and write our philosophy. You can’t write a philosophy if you don’t have any experience so it helps you to reflect. It did help me - when I look back and see what I have done. See what ways I can change it and how I can do better.

Christina also demonstrated that reflection could help her to develop her teaching for the future in this way:

Yeah, I think it’s the reflection definitely. ….because I think it really helps you look at what didn’t go well. What you’re doing right and what the kids like and what they’re not interested in and it helps you really to create curriculum or lessons for the children.
In the e-portfolio, Christina’s reflection started from how she planned a lesson, to how she taught the lesson, to what she had learned. That is, she re-examined the lesson (curriculum) and thought about ways she could teach better.

When the preservice teachers looked at artifacts they collected during their educational program, they reflected on how to make connections between past, present, and future experiences. They began to question what they know and have learned, why they have done that, and where they need to go in the future. As for Jane, Darcy, and Christina, the e-portfolios could bring their past and present experiences all together and lead them into possible change for future experience. In sum, e-portfolios supported reflection as a thread that connects their past, present, and future experiences for leading them to reflect on the educational practice.

4.3.4.3 Cautions about reflection through the e-portfolio

“I don’t need to look at a portfolio to remember that about myself. No, not really. E-portfolio can’t help me reflect more.”

Based on six preservice teachers’ responses, the e-portfolio led to some levels of reflection. However, three preservice teachers did not agree that e-portfolios helped them to reflect on their learning. Ella pointed out that there were many ways they could reflect on their teaching such as journal writings and classroom discussions. She said:

I wouldn’t necessarily see more [Question: Did the e-portfolio can help you to reflect more?]. I think you can talk, just kind of reflect upon the whole learning experience but I think just going into the whole student teaching experience, writing in the journal, it is all helpful.

Although Ella did not view the e-portfolio as more helpful with reflection than other things she did. However, she did consider the e-portfolio provided as a good way to
organize her reflections on the course work and to pull them all together. It was easier for her to reflect in her journal writings.

Sandy believed that doing e-portfolio helped her to write down her learning, but she was not sure that the e-portfolio stimulated reflection. She thought it was important to think back and reflect whether she did the e-portfolio or not. She said “I think looking back always important. Even if we do not have the e-portfolio; I think I would still reflect back my learning,” She thought her personal approach was generally reflective.

Vinita also had the same opinion that the e-portfolio did not help her to reflect on her learning more. She believed that the statements in relating teaching and learning in her e-portfolio were all her beliefs of education. She did not need to look back at her e-portfolio to reminder herself about her belief. From her point of view, other ways such as writing a journal on daily teaching would contribute to her teaching but not her e-portfolio. The e-portfolio could not help her with seeing how she constructed her learning. She pointed out that:

No, it helps me to know how much I have learned but I don’t think that is going to contribute to me and my teaching…like the stuff that I know, like being child centered, constructivism, and integrating diversity. And I was able to put those in my theoretical statements because I truly believe that. I don’t need to look at a portfolio to remember that about myself. No, not really. E-portfolios can’t help me reflect more. There are other ways to be reflective more, like I have a journal about my daily teaching that is much more valuable for teaching. Because it’s me teaching so I am knowing, oh, this is how it’s constructed, this is what my reflection was, and that is the lesson. I’ll know what is happening and what has worked well. None of that is in my portfolio.

Vinita had a strong belief about teaching. She thought that reflection was about her thinking process. The e-portfolio did not help to capture that process.

4.3.5 Sharing their learning

“It is a good way for sharing information.”
The students saved their work for the portfolio as computer readable files, and when they were finished, they published their e-portfolio on the internet. This made this documentation of learning publicly accessible to others.

In the survey data, eighty-one percent of the preservice teachers strongly agreed and agreed that “I am proud of my work of e-portfolio” and in responding to survey question 10, 90% strongly agreed and agreed that “I feel ownership of my e-portfolio” (see table 4.4). The preservice teachers felt an ownership of their e-portfolio and were proud of with their e-portfolio. This is likely to support their willingness to share their e-portfolio with others. The preservice teachers ranked “Sharing my learning with other easily” as one of three most important advantages of developing an e-portfolio (see figure 4.2), The possible result showed 71% preservice teachers strongly agreed and agreed that the e-portfolio helped them to be open-minded about sharing their learning experience with others (see table 4.4). They mostly shared their e-portfolios with instructor, peers, and family (see figure 4.3).

As Dr. Taylor demonstrated in the faculty interview:

It [e-portfolio] allows students to create a safe place where they can put all, really evidence of their knowledge and growth over the course of the MED program. So it’s all in one place and it’s portable so that you can actually share it with other people, share with parents, share it with whomever.

During preservice teacher interviews, six preservice teachers stated that the e-portfolio was a tool to share their learning stories with others and learning from others as well. One preservice teacher, Mike, described his e-portfolio as “an open book that anyone could look at,” and another preservice teacher Miki commented, “It is a good way for sharing information.” The preservice teachers could show their e-portfolios to their family, friends, colleagues, and even potential employers.
4.3.5.1 Sharing with friends and family

“I go home and show my parents what I’m working on and show it to my roommate or show other people.”

Preservice teacher Anna gave an example of how she shared her e-portfolio with her parents, roommate, and other people. She thought it is good for sharing because the e-portfolio had color, pictures, and wording. Compared to only paper writing, in the e-portfolio her learning experience was more vivid. She believed the e-portfolio could draw on people’s interest while they viewed it. Anna said:

I go home and show my parents what I’m working on and show it to my roommate or show other people. If I showed them a 40-page paper, they wouldn’t really been interested in reading that but this was something interactive that they were enticed by the colors and the pictures and the wording and I could walk them through and read every word that I put on there. I could kind of give them a walk through it. So I think it’s a learning experience for myself and for them to kind of share these experiences.

Having the same idea that the e-portfolio was a sharing tool, Rachel also shared her learning with her parents and a potential employer by using the e-portfolio even though the employer was in another state. She stated:

I’m very proud of it (e-portfolio). I share it with everybody. Yep, my parents get to see, cause they’re in Pittsburgh, they get to see what I have done. I’m the only one in Ohio. So they’ve followed me through that. And then the people in South Carolina, he [the potential employer] has watched my process. So the recruiting guy he has watched it, and gave me feedback on it too. They told me, like, this is great.

4.3.5.2 Sharing with potential employers

“I used it to help me to get my job. You know, kind of talk about it and using it as an example of my teaching and as the way that I am current with technology.”

Three preservice teachers also discussed how they used their e-portfolios with potential employers during job hunting. They believed that their e-portfolios gave the job
interviewers a better understanding of who they are and it showed how much they had
learned and could do. Mike indicated that:

I feel like it’s beneficial in, like, job hunts…even though I’m a couple of states
away, I’m 500 miles away or so. I can still give the principals what they’re looking
for at the website and then, kind of, get a sense of who I am.

Beth and Miki shared her e-portfolio with future employers during the interview process
and got the jobs. In the follow-up interview, Beth reflected how she used e-portfolio to
help her to get the teaching job:

You know, like in a job interview, you know you could…. I told them I created an
online portfolio and they are even more impressed by that. So I can explain to them
what I have learned and what I did. And that really impressed them about me and
my learning and my graduate program because it was something different because
they are trying to integrate technology into school and it was a really important
thing. I gave them my website for them to look at on their own …I gave them my
URL. I printed some of my stuff from it but not all of it. . . . I put a “Thank-You”
card and business card in my paper portfolio. I know that they were really happy
with the idea that I did that.

Beth’s e-portfolio facilitated her getting a teaching job. Miki had the same experience.

She reflected on her job interview in her follow-up interview:

I used it to help me to get my job. You know, kind of talk about it and using it as an
example of my teaching and as the way that I am current with technology. I think it
helped me a lot to get my job…. That is my first year teaching. It lets me get in
there. Before the school stared, there were bunch of interviews. My website was in
my resume and it helped people who interviewed me to look at it. . . . I think it
facilitated me to get the job.

4.3.5.3 Sharing as a way of presenting (introducing) self

For these preservice teachers’ experience, the e-portfolio was a tool to share their
learning with friends, parents, and expected employers. Besides that, two preservice
teachers pointed out that the e-portfolio was a tool to introduce themselves to their school
colleagues and students’ parents. Rachel planned to bring her e-portfolio into her school
in South Carolina to introduce herself to students’ parents and her future colleagues.
Being a new teacher, she considered people would be curious about her ability and beliefs in education. She suggested:

You could use this (the e-portfolio) and say “Hey! If you really want to get to know what I’ve been through and why I have my masters, you could see my whole progress in it.” Even the other teachers, if you need to you can show it to them to say “Hey! Here is where I come from. Can you agree with me or disagree with me? Can you show me different ways to approach this”? 

During the follow-up interview, Beth explained how she shared her e-portfolio with the parents, colleagues, and her students as well. She said:

I have a school website and I made a link to it so that my parents can go to the link and can see what I have done and my kids can go and look and learn about kids I had before and my parent can see what I have learned, my beliefs and everything, that give them a place to go to learn about me…It all gives my students a chance see when I mention about a lesson that I did. They can go back they can look pictures to see what I did with them. So they know what I taught with them [students in her student teaching] even though they were second graders and they are fourth graders. They can go in and see these pictures, meet with these students I talk about, and see me in different classroom where I taught other students. They really learned a lot about me when they are able to go and look at it.

Beth shared her past with her current students and parents. Beth demonstrated how the e-portfolio could be used by preservice teachers even after they graduated from the program.

Rachel and Beth’s examples also showed who they are as persons and future teachers. It gave people an opportunity to understand them better, as Rachel described:

The whole website is me, what I feel about teaching, what I feel that I’ve learned. How I’ve become who I am. I put all that up there. You kind of put it out there. I agree because I do think without that (e-portfolio) most of the professors and yourself and others wouldn’t be able to know that about me. They wouldn’t be able to see that’s the way I feel about teaching. I think it really gets an idea that we can - even peers by reading it they can - I can understand oh, okay. This is how Jane feels. This is her theory on everything and okay, this is where she came from and I think you get to learn a lot about the person and who they are and the teacher I’m going to become.
Another preservice teacher, Kelly, claimed that she liked the way that the e-portfolio helped her peers and professors understand her learning since she was not very interactive with peers and professors throughout the year. Kelly said:

I think I made it more personal and had a little of my personality in the whole thing. I think they will get to know me because I put a lot of my personal interest into my teaching and a lot of interest and beliefs…. I am not a good talker in the classroom and I never was all year. So, most of my professors do not know me very much.

As the preservice teachers shared their e-portfolios with others, people got the chance to look at preservice teachers’ works. That is, the e-portfolio was a tool that preservice teachers could learn about themselves, others, and teaching and learning.

4.3.5.4 Sharing results of self-reflection with others

“When a peer shared her e-portfolio, I was thinking that’s what I thought too. And then I started thinking what I think about that.”

Rachel claimed that she got to know about her peers’ growth and change by looking at their learning stories in the e-portfolios. She gave details saying:

Yeah, from both of their sharing I saw how they walked into the program. My one friend walked in very nervously - she had no idea of how she wanted her classroom to be run when she taught and how - like certain things, and then, as she went into presenting, she started to evolve and showed how she has changed from the program, so, like she started with this opinion and then from the classes and from the teaching she has formed her perspective now…Like for example - Equity and Diversity. She thought it was just the color of your skin or the culture, physically, then she learned that equity and diversity is a whole learning process.

Rachel got the chance to know where the peers had changed, at the same time she was reflecting on her own growth and change. She reflected in this way:

When peers’ shared her e-portfolio, I was thinking that’s what I thought too. And then I started thinking what I think about that. Or, like when I walked in there at the beginning and she said she had this opinion and then she formed into this, then I started thinking how did I start? What did I lock into and then from her learning, what did I learn, you know, from what she had talked about. Okay, did I learn the same things or how did I approach that.
Rachel not only appreciated their learning stories but also reflected on her learning. Thus, when preservice teachers had a chance to view others’ work, it provided a chance for them to learn.

Agreeing with Rachel, Miki believed that e-portfolio was a way to share information. While she was listening to peers’ sharing of their e-portfolios, she realized that they had posted so many good ideas about their lesson plans. She thought she would learn and get some ideas if she could view her peers’ e-portfolio more carefully. Therefore, Miki proposed that she would revisit peers’ websites during her school break to get some good ideas for lesson planning for second grade in the follow-up interview. She said:

One thing I always like to do is to go back to look everyone's e-portfolios just to get as many ideas as I can. Because I remember when people were presenting their e-portfolios, I kept on thinking; I have to go to look at this. Because, you know, my classmates had so many good ideas and things they had done during student teaching. I think that is one of the strong points of e-portfolios. You got to see what other people do in teaching.

Based on Miki’s view point, even preservice teachers who graduated could still learn from looking at other students’ e-portfolios.

4.3.5.5 Cautions about sharing

Three of the preservice teachers had concerns about sharing their e-portfolio with others because they were cautious about the quality and content of their e-portfolios.

Jane was concerned that the e-portfolio did not present her best works. As she finished her work in a rush, she did not feel the e-portfolio was the best quality work she could produce. She said:

It’s just a lot to do in a short amount of time. When you really truly take pride in something, you’ve spent your time on it. I want it to be my best quality, but
sometimes when you have three weeks you’re not turning out the best quality. I just worried about the quality.

Jane did not feel comfortable to sharing her e-portfolio with others. She declared “I am more than someone on my website.” The e-portfolio only presented one part of her. Moreover, she didn’t think that someone else would get to know her better through viewing her website. She declared that she is an open person and would rather talk to others than use the e-portfolio to present herself. She said:

I think there would have been many ways we could have presented our learning story. I don’t think anybody is going to know me better through my website… But I think anybody who knows me I’m pretty open. I will tell them my life story if they ask. So I think they can know me just by talking to me.

Another preservice teacher, Vinita, had another concern of sharing her e-portfolio with others. Vinita felt that her friends and family would not be interested in reading (viewing) her e-portfolio because it was all academic writing. She said:

I considered that only an educator would understand that. I don’t think anybody else would want to read it and I don’t know why I would want to show it to them. Besides I have shown it to my friends and they’re like “it’s great”, they look at it just for two seconds. They don’t want to sit there and read it…

From Vinita’ perspective, the preservice teachers viewed or shared their e-portfolios with others because it was requirement. She did not consider the e-portfolio would help her to understand her peers better. She said:

No [I would not understand peers better]. Because they are not only my educational colleagues, they are also my friends. Learning about their pedagogy did not help me to understand them better. I did not care about their pedagogy. It is not important to me. Because I am not evaluating them, hiring them, we are friends. Yeah! I am interested in what they did but it did not help me to know them better. I am not to judge them. I am just a peer. I put no value on that.

From Vinita’s point of view, the e-portfolio was just an assignment all the students did. She could learn about what they did for their course work but it was not helpful for her to
understand her peers better. Vinita also rejected the idea that the e-portfolio could be a sharing tool for a job interview and proposed:

When I was interviewing, I did not finish my e-portfolio yet. So I didn’t even want to mention in it because I would be embarrassed to show it to anybody… So, when I was interviewed by the principal I used a paper portfolio…I know even in some principals when you were interviewing the room does not have computer there that you can pull up your electronic portfolio. Even if they have a computer on the room, but not necessarily they’re going to sit there and want you to go the computer and let you pull up your website click, click and ask you questions.

Because the e-portfolio was not finished while she was interviewed, she did not feel comfortable sharing it with the interviewer. In addition, she did not believe job interviewers would have time to view it and allow her to present her e-portfolio.

Similar to Vinita, another preservice teacher, Katy, was also concerned about using the e-portfolio with potential employers. She said:

We had a bunch of principals come in and talk to us and we asked them if he had a website or e-portfolios to look at, would that be helpful if he was hiring us? And they said that they wouldn’t have time to look at it. So that kind of discouraged us. And we said “Well! Would you like a paper portfolio better? Would you prefer that?” And they’re like “Yeah! We would have loved to see the documentation, you working with students, pictures. Things like that.”

From Vinita and Katy’s point of views, they did not think using the e-portfolio during the job interview is not realistic since the e-portfolio content was too many to read with a short time.

4.4 Influences of sociocultural context for preservice teachers’ learning about e-portfolios

According to sociocultural theory, how we construct knowledge is interdependent between individuals and social process (Rogoff, 1995; Vygotsky, 1978; Wertsch, Rio, & Alvarez, 1995, Lave & Wenger, 1991). From this perspective, the preservice teachers’ learning of e-portfolio could be described as a socioculturally structured collective
activity (Rogoff, 1995) that involved a close interaction between people and the social environment. Based on the research data, peer learning, mentor teachers’ guided participation, and mutual engagement from the program influenced the preservice teachers’ learning while developing their e-portfolios as table 4.5 summarized.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Data</th>
<th>31 Survey</th>
<th>17 preservice teachers interviews</th>
<th>9 faculty interviews</th>
<th>6 follow-up interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers learning</td>
<td>Peers’ technology skills help</td>
<td>Q33</td>
<td>7 (+)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers’ websites</td>
<td></td>
<td>5 (+)</td>
<td>1 (+)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers’ idea sharing</td>
<td></td>
<td>6 (+) 1 (-)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers’ psychological support</td>
<td></td>
<td>7 (+)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentors’ guided participation</td>
<td>Q33</td>
<td></td>
<td>5 (+), 12 (-)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The mutual engagement from program</td>
<td>The instructors’ guided participation</td>
<td>Q14, Q29</td>
<td>7 (+)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>incorporated course assignments,</td>
<td>Q2, Q3, Q 6, Q13 Q29</td>
<td>17 (-)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>directed/clear expectation</td>
<td>Q18, Q28</td>
<td>9 (-)</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.5: Summary of sociocultural context influences for learning e-portfolios

In the survey data, table 4.6 shows how the preservice teachers perceived the social engagement that supported their development of the e-portfolios. In responding to question 29, the preservice teacher ranked the three most helpful resources that helped
them to develop their e-portfolio as these included: “relevant courses” “instructors’ assistance” and “help form technology assistants” (see figure 4.4).

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Strongly agree (%)</th>
<th>Agree (%)</th>
<th>Undecided (%)</th>
<th>disagree (%)</th>
<th>Strongly disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2. interested in developing e-portfolio in the beginning</td>
<td>29%</td>
<td>29%</td>
<td>23%</td>
<td>19%</td>
<td>0%</td>
</tr>
<tr>
<td>Q3. enjoyed the process of developing e-portfolio</td>
<td>13%</td>
<td>25%</td>
<td>19%</td>
<td>42%</td>
<td>3%</td>
</tr>
<tr>
<td>Q6. learned sufficient technological skills to develop e-portfolio</td>
<td>23%</td>
<td>45%</td>
<td>13%</td>
<td>13%</td>
<td>6%</td>
</tr>
<tr>
<td>Q13. e-portfolio was integrated into M.Ed. courses</td>
<td>10%</td>
<td>13%</td>
<td>10%</td>
<td>48%</td>
<td>19%</td>
</tr>
<tr>
<td>Q14. instructors were willing to help students to develop e-portfolios</td>
<td>13%</td>
<td>42%</td>
<td>32%</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td>Q17. received technical aid form technology assistants</td>
<td>19%</td>
<td>51%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Q18. was given directed instruction for doing my e-portfolio assignments</td>
<td>6%</td>
<td>44%</td>
<td>17%</td>
<td>27%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Table 4.6: Percentage of social engagement for e-portfolios

It is probable that the program provided sufficient human resources for helping the preservice teachers to develop the technology skills needed to develop their e-portfolios. Sixty eight percent of the preservice teachers strongly agreed and agreed that they learned sufficient technological skills from the introductory technology course to develop their e-portfolio (see table 4.6 Q6). This seems to indicate that the technology course was necessary to enhance the preservice teachers’ ability to construct the e-portfolio. In corresponding questions, number 6, 14, and 17 (see table 4.6), the data also indicates the
students’ perception that learning to develop their e-portfolio was situated in a social environment in which they had adequate resources of personnel and curriculum.

With program supports, the results indicate that 58% students strongly agreed and agreed that they were interested in developing their e-portfolio in the beginning (see table 4.6 Q2). It is possible to say that many students had a positive attitude as they took the technology introductory course to build the interface for their e-portfolios. However, there were 45% preservice teachers who disagreed and strongly disagreed that they enjoyed the process of developing their e-portfolios (see table 4.6, Q3). It seems that they were more interested in the doing e-portfolios in the beginning of program, however, during the school year their attitude about portfolio development changed.

Figure 4.4: The three most helpful resources for developing e-portfolio

A= rich technological equipment  B= relevant courses  C= technology course  D= instructors’ assistance  E= help from technology assistants  F= other
Why the preservice teachers attitudes toward the process of developing e-portfolio changed may be explained by reading the data shown in figure 4.5. In responding to question 28, preservice teachers ranked “time demands”, “lack of technological skills’ and “calcification of direction” as the three strongest disadvantages in developing the e-portfolio. Within a year long program, without clear directions, combined with a lot of course work and field experience, they felt overwhelmed and could not give much attention to e-portfolio development during the year. Sixty seven percent of the preservice teachers strongly disagreed and disagreed that the e-portfolio was integrated into each M.Ed. course (see table 4.6) indicating that the preservice teachers had a hard time seeing the connection between e-portfolio and the courses they took throughout the year.

Figure 4.5: The three most important disadvantages of developing an e-portfolio

A= time demands  B= lack of technology skills  C= inadequate equipments  D= server space limited E= privacy F= cyber plagiarism  G= other (clarification of direction)
The survey data indicated that the students perceived a lack of connection between the e-portfolio and courses which affected the development of their e-portfolio throughout the year. That is to say, the preservice teachers did not have to practice technological skills to develop their e-portfolios within their course assignments. They took the technology course (P&L 791) as the entry course for developing e-portfolio and were introduced to web design. The program’s goal was that the preservice teachers would practice technological skills frequently within their required methods course in the following two quarters. This would have supported the on-going development of their e-portfolios. In reality, the preservice teachers learned the technology skills during their first quarter and then did not really use those skills until the following summer, which was one year later. They likely forgot the skills they learned. Most preservice teachers had to refresh their technology skills within the five weeks in which they were also developing their e-portfolios. In this short period of time, the preservice teachers were in a rush to finish up their e-portfolio and because of their lack of technology skills, many did not enjoy the process.

In questions 4 and 5, preservice teachers responded that their development of the e-portfolio was situated in a social environment in which they had adequate resources of personnel and curriculum. Peers, instructors, mentor teachers, and the mutual engagement of program influence are described in the following.

4.4.1 Peers learning

In responding to interview question 4, seventeen preservice teachers responded that peers played an important role in the process of developing the e-portfolio. Based on their
response, the peers’ influence can be seen in four areas: peers’ technological skills help, peers’ websites, peers’ idea sharing, and peers’ psychological support.

4.4.1.1 Peers’ technological skills help

“We all kind of went through it all. Yeah, we helped each other, because many of us did not remember how to work FrontPage.”

Six preservice teachers stated that peers technological support was very helpful during the process of developing e-portfolio, especially for those who were not comfortable with using FrontPage. As Christina described:

Yeah, the beginning - I never have used FrontPage. I didn’t even know where to start it. It was really, really hard for me. I didn’t know anything about it so I had to look at my peers to really help me and guide me.

Another preservice teacher, Jane also agreed that her peers’ help with the technology was very supportive. She said:

I wasn’t very good at navigation or hyperlink or any of that so I had - luckily I had peers who could help me….I needed support. I needed technological support, yes.

For those preservice teachers who were novices in doing webpage design, such as Jane and Christina, they sometimes observed how peers used those skills and sometimes they directly asked for help or listened to their suggestions. As a result, based on the peers’ support, those with less technological skills were able to develop their e-portfolios finally.

In Kelly, Emily, and Mike’s opinion, they did not practice during the year what they learned in the first summer. Most of them forgot those technological skills. However, as they worked as a group, they refreshed their memory together. It was evident that these preservice teachers were not afraid to ask for help from their peers. They had worked and learned together as the community to help each other, as Mike described:
It definitely affected everybody cause everyone, no one really thought that they were in it by themselves, everyone felt like we were creating it together. So it was definitely a constant back and forth feedback of giving out ideas and people were learning how to make their own... We kind of learned what works and what doesn’t work on the website, you know, from other people’s mistakes, other people’s, you know, like, “that looks good”, “let’s try it online” or “I don’t think I like that, so I’m going to stay away from it” and also, we also learned just like… different technologies. Everybody kind of learned different stuff.

As Mike described, no one went through the process by themselves, he helped others or others helped him while developing the e-portfolio. From Mike’s point of view, no one was the expert in technological skills; they were all kind of learning by trial and error and helping each other. Peers viewed each other’s websites. He taught Chad how to insert the pictures. They stayed with the group and worked together to help each other. They were refreshing and practicing their technology skills together, helping each other because no one was proficient in developing websites (06/26/04 observation notes).

Other preservice teachers, Emily, Chad, and Christina, said that they always asked the person who sat beside them for help if they had a problem no matter who the person was. Christina declared:

Oh. People sit beside me. Like [inaudible], okay, well, how do I do better? How do I…if the picture is turned from the kids’ face? I’ve asked people how to insert pictures or how even to crop pictures.

Kelly reflected on how she and peers worked together in figuring out the problems they had:

Having people check the layout to see if I needed double spaces or stuff like that or is it hard to read. And we all kind of found out that if you put everything up into 12- Font in FrontPage it is big. But when you go to your browser it is tiny. So we all kind of went through it all. Yeah, we helped each other, because many of us did not remember how to work FrontPage.

Another example of peer assistance was described by Christina. She did not get three parents’ internet release permission. She could not show these three students faces
in her e-portfolio. As she wanted to insert a class picture into her website, she was concerned about how to cover these three children’s faces. A peer, Darcy, who sat behind Christina one day, helped her to blur the students’ faces by showing her how to use the Photoshop (observation notes, 7/07/04). Preservice teachers who had advanced technological skills, such as Darcy, were willing to help peers who had problems. Darcy and Ella declared that they felt comfortable with technology and that they helped their peers all the time. Darcy said that peers just “come and ask questions. I do not mind helping them if I know.” Ella had a similar response to help peers solve technology problems. She said:

I’m proficient on the computer so I helped a bunch of them in there [the computer lab]. So it was really - I’ve scanned pictures before. I’ve done it a lot. So that wasn’t a big deal. The technology part of it wasn’t hard for me at all.

That is, as preservice teachers worked together as a group, some were proficient with technology and some were not. Those who had more skills guided those who were less proficient. They worked as a community of practice to share their technological skills in different ways in order to develop their e-portfolios.

4.4.1.2 Peers’ websites

“I looked at two people’s websites and saw how they started out. It just gave me new ideas - how they set up pictures or how they began to write the statement.”

The preservice teachers shared their technology skills to develop their e-portfolio. They also shared their websites with peers. Five presevice teachers reported that they gained some ideas for designing their e-portfolios when they got the chance to view their peers’ websites. This provided different ideas for fulfilling the requirements of e-portfolio. One preservice teacher, Kelly, had difficult writing her final reflection. She decided to look at her peers’ websites to see what they were doing and how they made
the connection between the four themes and their learning. After she looked around
different people’s websites, she felt more relaxed and had clearer thoughts about her final
reflection. She said:

I wrote the first one [the final reflection] and it was awful and it was not creative at all. I had no clue where I was going with it until I got on a colleague’s website and kind of looked around different people to see what they are doing and something that ...it can be alternative. It can be whatever. Just, well, knowing their application of what we were supposed to do other than finding the instruction from syllabus.

As she found out that the peers used different ways of doing their final reflections, such as poems and quotes to present their learning journey, Kelly was inspired and chose to utilize children’s picture books to organize her final reflection (http://www.education.osu.edu/classes/hartleyk/final_reflection.htm#themes). She used Julie Danneberg’s book of “First Day Jitters” to illustrate the first day of student teaching, Lori Malone Elliott’s “Hunter’s Best Friend at School” for Learning and Development, Max Lucado’s “You Are Special” for Equity and Diversity, Janell Cannon’s “Stellaluna” for Family and Community, and Lori Numeroff’s “If You Give a Pig a Pancake” for Constructing Curriculum. The result was that her final reflection in the e-portfolio was very unique and creative.

Christina had a similar experience after viewing her peers’ websites. She believed that her peers’ websites stimulated her ideas about where to put pictures and how to tie lesson plan exemplars to the four themes. She demonstrated:

[Is it a help when you look out at other websites?] Yeah. It did. I looked at two people’s websites and saw how they started out. It just gave me new ideas - how they set up pictures or how they began to write the statement, like their philosophy statements and the things and examples to see how they tied it with their philosophies… or even just like what kind of examples to use based on like he [the instructor] said four philosophies because you had to have two examples on each of those.
The other preservice teacher, Mike, stated that viewing his peers’ websites facilitated his creativity because it demonstrated for him different ways of doing the e-portfolio assignment. From examining others’ works, it reminded him to keep on focus.

Uh, it [peers’ e-portfolios] definitely helps with your creativity, like sometimes I want to get really creative but my mind can’t really focus, my mind is thinking too big where as if I look at a couple different examples to see where they’re focusing I can save my creativity for that. It helps me focus a little bit better on it.

Emily also agreed that looking at peers’ websites gave her some ideas about doing the e-portfolio, such as the designs, and linking examples. She said:

   How did you link this together? Or how did you do that design? Not doing the same thing but take a look, they had and make something different with it or what examples they had. I had an example of something like that that I could use too.

Even if it just kept her from not doing the same thing, Emily concurred that she could learn from viewing other websites. Another preservice teacher, Vinita claimed:

   The technological part was not the hard part. The hard part was putting the content in. Because that is what we wanted to do . . . So when we look each other site we can get ideas for knowing how they do it.

For these five students, viewing other students’ websites and knowing how others did things in their e-portfolios provided ideas and perspectives which helped them develop their own e-portfolio.

4.4.1.3 Peers’ idea sharing

“We were kind of sharing with each other our thoughts of how we would put things together.”

Not only did the preservice teachers work together to solve technology problems and view each other’s websites to help develop their e-portfolio, six preservice teachers also acknowledged that they benefited from sharing their ideas with each other. While they met in the classroom, I observed how they contributed their ideas, such as how to create
the course examples to support their educational philosophy statements. They talked
together about what kinds of examples were good to use. As they talked with each other
they gained insights into how to select examples for their statement and how to connect
their practice and theory. In other words, they created a clearer vision of their work.

Emily stated:

We were sharing with each other what kind of examples do you have for that? So we
were kind of sharing with each other our thoughts of how we would put things
together. So definitely within the last few weeks we talked a lot to each other on
how did you do this and how do you incorporate that and explain that example.

Similar to Emily, Anna and Mike demonstrated that peers’ idea sharing could
provide different views to each other, whether it was a question, a suggestion, or an
appreciation of a peers’ e-portfolio work. It was the way they were learning from each
other. Anna said:

I think it’s kind of at the end of this process we’re kind of all - you know close to
each other. We can kind of get the feedback I think that is important, still. you know,
take what they have to say to get consideration and know, once again, she could take
that advice or she wouldn’t take the advice but I think it’s helpful to talk with others
and get their views on it.

Since preservice teachers studied together for a year and had built relationships with each
other, Anna believed they were not afraid to give their feedback to others. I observed
Anna suggest to Kelly that she should use more course examples to demonstrate her final
reflection while Kelly was presenting her e-portfolio to the small group (07/19/04
observation notes in computer lab). Anna also reported that it was very helpful in the
capstone classroom meeting when they did brainstorming together to share the idea of
course examples and how to write reflections under each themes. She said:

First or second classroom we did brainstorming, about things that we were going to
put on that. I think that was nice and then I thought like “oh” - someone says “oh,
I’m going to put a reflection in there” and I was like “gee, I reflected on that every...
day. That’s a place that I can put something in there.” So I guess that that was helpful to get feedback from them.

As I observed the big group discussion in the classroom, one preservice teacher gave an example that she went on a fieldtrip to the fire station with students during her student teaching. She planned to use this to illustrate “Community and Family”. Another preservice teacher said she would use what the students learned at the school cultural celebration as an example to illustrate her Diversity and Equity learning (classroom observation note 06/21/04). While the presevice teachers talked about their ideas, other preservice teachers’ thinking and work were guided and enhanced. Sandy gave her opinion of peers’ ideas’ sharing:

   The one girl said that she was going to - she had talked about reflecting on her teaching - She was going to use a few of her actual journal writings as examples for the final reflection. I wouldn’t have thought about that. And I didn’t end up using it but I thought it was a good idea. It made me look at it in a different way.

Ella emphasized that she learned from everyone that she got the chance to talk or listen to. She said:

   I think I learned from - everyone else like I get talking to them and it’s so helpful to get all their ideas and look up all of the websites. I think it was helpful to work with small groups, I would say cooperative learning and I’d say - sort of like scaffolding was going on just because some people were more aware of what was going on and how to do more things.

There were some preservice teachers who had more knowledge of the e-portfolio than her working in the small group had been helpful for Ella.

   In contrast to Ella, Lori didn’t like working in small group to share ideas. She identified herself is an independent person who wanted to do her own thing. She believed that reflection was very personal. She did not think other people’s ideas would make her reflection better or change what she decided to do in her portfolio. She said:
I mean because it was my own reflection. No one else can add to that or take away from it. So I just feel that working in small groups is not the way for me. When you get into a small group, it doesn’t really matter what anybody else says you just want to go with your information. I mean (inaudible) - that’s just the kind of person I am. I like to work independently. I also like to really work on my own.

From Lori’s point of view, she was the person who usually had plans in her mind ahead of her peers and so she preferred to work independently. However, she did admit that her group benefited from her sharing. She showed her group her portfolio structure design whereas her peers had not having anything on it. She said:

I think so [the peers got the benefit] because I remember I was like “well this is how I did it” and I was showing them. I was like ahead of the game because I wanted - over spring break because I knew we were going to have to do it and [inaudible]. So I came out with these basic things….I remember I told them how I did it.

Lori viewed herself as a giver not a receiver in a group. As a result, in her case, she did not see her peers’ ideas as helpful.

4.4.1.4 Peers’ psychological support

“When one of us started to get too frustrated we kind of came together and brought them back and said we’re going to get through this. We solved it together.”

The learning process did not always go smoothly. Sometimes the preservice teachers encountered technology skill problems and sometimes they had a concern about the content. Sometimes the process was quite emotional. Seven preservice teachers reported that they had mental support from peers. Rachel described it this way: “When one of us started to get too frustrated we kind of came together and brought them back and said we’re going to get through this. We solved it together.” Rachel said that they cried, laughed, and worked all together to get through the process. For example, Jane was with Rachel’s group. She was the one who got emotional easily because she struggled with computers. Rachel comforted her whenever Jane became very emotional. One day she
cried at the computer lab and kept saying “It is too much, I cannot finish this.” Rachel told her not to worry, just keep going, they will go through this together. (07/07/04 observation notes in the computer lab). Describing how she helped Jane, Rachel responded:

She [Jane] was someone that really - ahh - she came in one day very upset. But sometimes it’s my turn when I come in like that, I was really struggling to stay with it and without them, and then, we each kind of cycle into where we’re doing great. There’s always something that they are doing good and they balance us.

From Rachel’s point of view, peers gave emotional support when their peers were anxious, frustrated, and worried about their e-portfolio work. To deal with emotional reaction, Emily pointed out that talking with peers helped her feel calm and not overwhelmed. She said:

I think that first summer quarter it was extremely difficult because everyone is so afraid. And it did help to kind of talk with others. During that time I found that most other people didn’t know what was going on either. It was just kind of - like just talking, but it was generally helpful.

As preservice teachers talked with each other, they discovered that they were not the only ones who had problems with developing the e-portfolio. They became more secure asking for help because everyone was in the same situation. Anna agreed that peers shared a lot of emotional support even though most of time they got together to express negative feelings. She explained:

We [peers] talked about it [e-portfolio]. Sometimes it was negative things like the lack of structure and time and things like that. So it’s kind of nice to know that others were experiencing it too and they kind of gave each other support.

Kelly had a similar response, she pointed out: “We got frustrated here a lot and I think we just were yakking with each other and then maybe it just seemed like we are so out there and not very informed.” Talking with peers who understood their worries and problems
was a way to decrease their tension. If they did not feel informed enough to do the work, the way to clarify their questions was to talk with peers. By talking, preservice teachers got a common understanding of the requirements and expectations. Darcy had more advanced technological skills than her peers. As she observed that her peers were panicked in dealing with computers, she would try to calm them down. In responding the question of how she shared with peers, she said:

I was real interested in it [webpage design] but a lot of people were really frustrated with it because they got annoyed with it. It didn’t really bother me though.

In continuing, Darcy explained the way she helped her peers in saying:

Yeah, I’d try to calm them down, because the computer is not going to hurt you, I promise. But see I’m a computer person so it doesn’t - nothing on a computer really scares me. Just trying to help them so they calm down about it because they were like so worried and I’m like it’s not that big a deal, you’ll get it done.

Another preservice teacher Vinita revealed, “Yes. In the past three weeks. Yeah, and there’s a level of mental support. You need to finish it [e-portfolio] and to offer each other that.” From these seven preservice teachers’ point of view, the emotional support from peers was necessary for them to do the work. The psychological support could be talking, listening, or comforting. As preservice teachers offered or were offered those supports, they would become less overwhelmed with the work and could then concentrate on doing their work with less worry and stress.

4.4.2 Mentors teachers’ guided participation

“She [mentor teacher] knew I needed to take pictures and she helped me out with that by taking pictures for me and tried to remind me that I needed to take pictures. She did know that I needed to document certain units and do reflection on certain units. I discussed that with her.”

The preservice teachers had their student teaching during 2004 spring quarter, which meant that they were with their mentor teachers while they were documenting their
teaching for their portfolio. If the preservice teachers could get help from their mentor teachers, this facilitated collecting artifacts for documentation. In responding to how their mentor supported their e-portfolio (interview question #4), 17 of the preservice teachers responded that mentor teachers knew that the preservice teachers needed to do the e-portfolio. Five preservice teachers, Lori, Miki, Betty, Rachel, and Anna indicated that they got help from the mentor teachers such as collecting students’ work, sharing lesson plan, or taking pictures. Lori stated that she told her mentor teacher that she needed to do the e-portfolio work during the student teaching.

She [the mentor teacher] was helping me by saying “I have this and this about the student work.” For the case study she said, “If you have some questions about that, come to me.”

She felt that she was supported by the mentor teacher not only in substance but also mental support. She said:

She thought it was ridiculous that we had to do all this stuff on top of student teaching. She was saying, “You have a case study and documentation at same time. That’s a lot to do while you’re trying to plan to teach.” I said, “I know.” - She thought it was too much.

From Lori’s point of view, the mentor teacher understood her struggles.

Another preservice teacher, Miki, said she talked about her e-portfolio with her mentor teacher and the mentor teacher was helpful with taking pictures and xeroxing students’ work. The artifacts she collected during her student teaching were effective in her portfolio. As Miki believed classroom experience provided the foundation of her website, she wanted to share her e-portfolio with her mentor because the mentor teacher deserved to see what she had done. Miki said:

As soon as I am done I’m going to e-mail her and say check it out because there are pictures of the class and things that we did together. I think that she will feel proud.
Betty also stated that her mentor teacher helped her to take pictures. Betty described the mentor teacher’s support in this way:

She had other student teachers from this program so she was aware of it. I don’t know how much she knew about it....She [mentor teacher] knew I needed to take pictures and she helped me out with that by taking pictures for me and tried to remind me that I needed to take pictures. She did know that I needed to document certain units and do reflection on certain units. I discussed that with her.

Since the mentor teacher had prior experience working with student teachers who were required to do e-portfolio, she was willing to help Betty. Betty believed that she learned about documentation from the mentor teacher.

Similar to Betty and Miki, Anna had a close relationship with her mentor. She and the mentor teacher discussed her work for the e-portfolio. Anna’s mentor was interested in technology and impressed by Anna’s work. Anna said:

At that time it wasn’t finished so I didn’t really share that with her but that’s something that we’re still - keep in touch with her, so definitely- you know- I will tell her to look at it. She’s very technological and she was very impressed that I was doing it myself and thought that was a great…Because she was an important part of my growth throughout the year, so she can kind of see my thoughts … I have a close relationship with her. I think that she’s interested in looking at it. She should share it.

Rachel also had a good relationship with her mentor. She confessed that the e-portfolio wasn’t on the top of her list for student teaching because there were so many things she needed to do. Despite this, she said her mentor helped her a lot in doing her e-portfolio:

She did. Yeah, my mentor teacher helped me a lot. She knew I have to do it… For the electronic portfolio, she knew I need pictures she took pictures for me. She saved all of documents she helped me with that. So I downloaded all that …. She burned me a CD of document so that help me. She did not need the pictures that she gave me. She took pictures for that reason [for my e-portfolio]. So she definitely helped. But we had a good connection.

Although five preservice teachers stated that they received the mentor teachers’ guided participation in developing their student teaching documentation, twelve
preservice teachers reported that they hardly discussed their e-portfolios with their mentor teachers so the mentor teachers did not support their e-portfolio very much. It maybe due to the fact that the mentor teachers did not have experience with e-portfolio and did not know how to help, or it could be that their focus was on supervising the preservice teachers’ student teaching; and as the program did not communicate with the mentor teachers about the e-portfolio project, they did not see the e-portfolio as their responsibility or did not see connections between the e-portfolio and supporting the preservice teachers learning to teach. As a result, these preservice teachers did not receive much help from their mentor teachers.

4.4.2.1 No shared interest and value of e-portfolios

“She [mentor teacher] didn’t really quite understand the concept, so it never really was brought up, especially when I was teaching.”

Mike reported that his mentor teacher did not give him much help for developing e-portfolios because he did not think the mentor teachers had much experience with e-portfolios. Hence, documenting student teaching never became a central focus while he was teaching. He explained:

She [mentor teacher] knew that I needed time for portfolio. She didn’t give me much help with the e-portfolio. I think mostly because she looked at it as…so she didn’t really quite understand the concept, so it never really was brought up, especially when I was teaching.

Darcy showed her website to her mentor teacher but she didn’t get much response to it. She said:

She didn’t really say much about it. She went to Ohio State too for her master but she did a thesis so it was totally different for her. She didn’t say it was bad but she didn’t say it was good. She didn’t really say anything about it.
Based on the mentors’ own educational experience, they seemed unprepared to help and unappreciative of the value of the e-portfolio. Consequently, these preservice teachers felt that the mentors did not care much about their e-portfolio work. The result was that they could not share the interest and value of e-portfolio with the mentor teachers, and they did not receive the mentor teachers’ help with documentation.

4.4.2.2 No mentor teacher’s help with taking photos

“That would have helped if my mentor teacher could have been in the room taking more pictures.”

Twelve presevice teachers reported they had to take pictures by themselves mostly while they were doing the student teaching. For example, Kelly wished her mentor teacher would have been more supportive in helping to take pictures of her with her students. She said:

I would have preferred that I had more pictures of me working with the kids. I wish she would have been more supportive in that role. Most of my pictures I took of the kids, … So I think that could have been something that would have helped if my mentor teacher could have been in the room taking more pictures. I did talk to her about it. I said listen, I need this but - there were a few pictures that I ended up getting and I think if there was more collaboration in that room when I was developing the portfolio I would have had more unique pictures showing me working with kids.

Kelly did not think she and her mentor shared a common goal to document student teaching. That’s why she requested help several times but the result turned out to be disappointing. Jane also complained that without the mentor teacher’s help to take pictures, she had a difficult time documenting her student teaching. She said:

I wish I would have had more pictures. I think pictures tell a whole lot. I didn’t take pictures you know it was hard for me to back up what I’m saying….It was hard to take pictures because when you’re in the middle of lesson your teaching, you’re in there by yourself. You’re so involved with the kids, with what you are doing, it’s hard for you to step back and say let me grab my camera.
From Jane’s point of view, if the mentor teacher helped to take pictures while she was teaching, she could present her student teaching in her e-portfolios with a visual way. Similar to Jane’s experience, Christina only uploaded two pictures of herself working with her students into her e-portfolios. She wished that she would have more pictures that showed she was working with children. She said:

*I am in, like, two pictures. My teacher knew what it was for but she didn’t give me any help. A lot of time she wasn’t in the room. She just left me to have the classroom kind of – it [developing the e-portfolios] wasn’t why we were there.*

From these twelve preservice teachers’ responses, it seems that the mentor teachers did not see helping preservice teachers to develop their e-portfolios as part of their obligation. Consequently, these preservice teachers did not have sufficient artifacts to upload into their e-portfolios when they had their capstone course later.

**4.4.3 The mutual engagement of program**

As the project of e-portfolio was the essential requirement for completing the M.Ed. program, the preservice teachers needed to have guidance from the program’s faculty in order to develop their e-portfolios. This section describes how the program’s mutual engagement provided collective activities which facilitated preservice teachers’ work of their e-portfolios. There were also ways in which a lack of mutual engagement limited the preservice teachers’ development of their e-portfolios. The data for this section is drawn from survey data as well as faculty and preservice teachers’ interview data. The categories include: 1) guided participation from the faculty, 2) incorporating the e-portfolio into course assignments, 3) directions (expectations) for the e-portfolio, and 4) the preservice teachers’ suggestions to the program.

**4.4.3.1 The instructors’ guided participation**
“I think that they gave us help but I think that they are not all technology savvy. They did not know much technology either and they mostly just wanted to sit down and try to help us.”

In the survey data showing, 13% preservice teachers strongly agreed and 42% agreed that “Instructors in the program were willing to help me in developing my e-portfoli0” (see table 4.6 Q14) and “Instructors’ assistance” was ranked as the second most helpful resource for developing e-portfolio in survey question 29 (see figure 4.4).

Interview responses about how the program faculty members were helpful in facilitating the preservice teachers’ works of e-portfolio were mixed. Six preservice teachers stated that faculty members were willing to help them to develop their e-portfolios, especially the faculty who taught the technology course and capstone courses.

As Anna and Vinita recalled their learning in the technology course, Anna said:

I think last summer I learned a lot from the instructor - it was more like in the lab. Actually hands-on, so we all had an opportunity to do that. So I definitely learned a lot form the instructor last year.

Similar to Anna, Beth, Ella and Christina also declared that the instructors helped them to figure out technology problems. Christina described:

We [peers] tried to help each other and if we couldn’t, we came to the professors. They would be able to help us through it. And I think this really helped us build relationships with our teachers and we could talk with them about our work… They [instructors] have been really helpful. Julie helps clarify any issues at all and her feedback was very helpful too, so we know we were on the right track, and Dr. Scott helped me by setting it up because I hadn’t used FrontPage in such a long time that I was having trouble even setting it up. He showed me how to do the Hyperlinks. He helped me a lot.

Another preservice teacher, Darcy, also agreed that the feedback from the instructor was helpful. She gave an example:

Actually Dr. Scott told me to use a color change so people can see the difference because he knew I wrote a lot more but - it was hard to tell where I changed without looking at each section.
From Anna, Ella, Christina, and Darcy’s point of view, the instructors were helpful either providing technological skill support or giving feedback to their works. Slightly different from those preservice teachers, Vinita had a different opinion on the feedback and technological support. She said:

They [the instructors] are so concerned about giving us feedback which we like. But maybe if we put time into doing technology, then we would not need so much feedback …I learned - I learned a lot from Dr. Brown. I learned a lot from him…Julie and Dr. Scott were great. But when it came to the technological stuff, they weren’t always able to carry it out. I think we helped each other.

From Vinita’s point of view, some faculty tried to help them but yet some were not very skillful with technology. Emily agreed:

I think that they gave us help but I think that they are not all technology savvy. They did not know much technology either and they mostly just wanted to sit down and try to help us. ..Yeah, I think Dr. Scott really was talking about attitude and not getting angry at us if we came out with like the same question over again. So I think that kind of helps us just be comfortable and feel okay to make mistakes.

Even though some of the faculty did not have many technology skills, Emily believed that they taught her a good attitude about learning with technology. They sat with the preservice teachers and tried to figure out problems together. Darcy had a similar respond. She said:

Dr. Scott kind of didn’t know some of the stuff on how to use it so that was frustrating some times. But he tried to help as much as possible. He’s always trying to do everything, no matter whether he could do it or not.

As Darcy and Emily described, Dr. Scott was a positive model for the preservice teachers about learning with technology. Based on my observation in the capstone computer lab, most of the preservice teachers panicked when they encountered a technological problem such as inserting pictures files, saving the scanning images. They asked the instructor to help as noted in my observation notes:
Some preservice teachers worked on how to scan the pictures and students’ writing and drawings. Dr. Scott worked with one student to save the pictures. They figured out picture files need to be saved as JPG file. Students also asked him how to publish their work to the internet. Dr. Scott tried to sit with them and go through the process to work out. One preservice teacher freaked out about everything in the computer lab, he stopped her and told her” Computers are your friends; There is no reason to be frightened” (06/30/04 observation notes in the computer lab).

During the faculty interview, Dr. Scott explained his belief in saying:

You [as the capstone instructor] have to have some technological savvy. What I mean by that is your ability to take what you know from Word and incorporate it into FrontPage. The ideas are very similar quite frequently. I have a lot I do not know in FrontPage, but I can figure it out between us and between the students….I think, yeah, you have to build a certain attitude toward it and take it on. Yeah, they’re gonna to be teachers and they have to have a different attitude toward learning. I mean they do not need to have all of skills but they have to have at least positive disposition toward technology.

From Dr. Scott’s perspective, it was unnecessary and impossible for teachers to be experts in each aspect. However, he tried to teach the preservice teachers to have a positive learning attitude toward technology.

4.4.3.2 Incorporated the e-portfolio into course assignments

“If they [professors] tried to integrate their assignments with what we needed to do for the portfolio I think that would have been a little more helpful.”

In the survey data, 68% of the preservice teachers strongly agreed and agreed that they learned sufficient technological skills to develop their e-portfolios (see table 4.6). These preservice teachers had ranked the technology course as the most helpful resource for them in developing the e-portfolio (see figure 4.4). However, there were 67% preservice teachers who disagreed and strongly disagreed that “the e-portfolio was integrated into each of my M.Ed. courses” (see table 4.6).

During the preservice teacher interviews, seventeen preservice teachers explained that the faculty all mentioned the e-portfolio throughout the year during their classes. The
e-portfolio was incorporated into the first quarter technology course and the last quarter capstone course. However, some of the faculty did not discuss it specifically. The result was that the preservice teachers did not make connections between their course assignments and the e-portfolios throughout the year.

Seventeen preservice teachers admitted that the P&L 791 technology course integrated with the e-portfolio project that helped them learn a lot of technology skills in developing their e-portfolio. These preservice teachers reported they had a lot of hands-on experiences to learn technology in order to create e-portfolio which was very helpful as Miki described:

I think that last summer when we had our technology class. If we wouldn’t have had that I think this would have been a disaster. Having the lab then and learning how to do things last summer was a good idea because we weren’t very technologically advanced.

and Anna reported:

I think last summer [P&L 791 course] was good. It taught me a lot but definitely this summer I had to review a little bit. I took notes from last year so I was able to - it kind of quickly came back to me.

Although the preservice teachers did not practice those skills much during the year, for Anna it came back somehow when she began to work on her e-portfolios. Sandy agreed that the technology class provided the chance for her to learn technology in doing the e-portfolio. She was not familiar with technology and afraid of it before the course. However, after taking the technology course, she overcame her fear of using technology. She said:

The technology part was very frustrating for me because I’m not very computer literate. So it was really, really hard to know what to do, how to do it. But the class that I had in last summer was very helpful for that. And just from doing it, apparently I’ve gotten over my fears of the technology part now.
The preservice teachers had a chance to learn all kind of technology skills such as FrontPage, Excel, and PowerPoint. Not only did they learn educational software programs, but they learned about educational websites and software and how to evaluate them and to create a web-based lesson. As a result, many of the preservice teachers seemed to have learned sufficient skills for developing their e-portfolio and had the knowledge of educational technology through the technology course’s assignments.

Even though the e-portfolio was incorporated into the technology course well, sixty-seven percentage of preservice teachers disagreed and strongly disagreed that the e-portfolio was integrated into each the M.Ed. courses throughout the year. Some of the method courses did not address the e-portfolio specifically. One preservice teacher, Sandy, thought that most of the instructors valued the e-portfolios but they did not have a clear understanding of the e-portfolio either. Therefore, the faculty could not give the preservice teachers concrete directions to help them in developing their e-portfolios.

Sandy said:

During the year they talked about that [e-portfolio]. I think the only ones that didn’t talk about it were the X course. I think everybody had mentioned it in their courses, like Dr. Taylor, Dr. Smith and Dr. Scott, Dr. Oliver. They didn’t say specific things earlier in the year but they were all mentioned it. They all said to keep this [e-portfolio] in mind. I think, like I said earlier if we knew specific things of what was expected, we could have maybe, when we did our assignments, we could have focused them more on how they would fit into the final theme.

Similar to Sandy’s notion, Lori did not think the course professors were really helpful related to the e-portfolio work. She explained:

I don’t think they knew enough about what was going on to help us. Because every time they would say that they will be able to read our work, they were also saying - they didn’t understand what we needed to do and I think that was a problem. They would say “I think you’ll need two paragraphs for your philosophy.” But I mean really, we did not understand what that meant. I don’t think they understood that [the e-portfolio]. They were like, you know, “Turn in something to me, I’ll be reading it
and give it back to you then you can work it into your website.” We didn’t know how to do that.

Sandy and Lori felt like the professors did not show them enough specifically about examples, documentation, or references to back up their statements. They did not feel the course assignments were connected to the e-portfolio specifically. Miki agreed: “If they [professors] tried to integrate their assignments with what we needed to do for the portfolio I think that would have been a little more helpful.” Vinita and Katy concurred that even though the professors had good intentions to incorporate the e-portfolio into their assignments, the course assignments did not always fit with the e-portfolio’s requirements. Katy asserted:

I think everybody [the professors] has good intentions of incorporating the portfolio in their course work so we could use it in course work and in our portfolio later on although I think the professor and us were kind of not quite clear on what the expectations were. Therefore they were assigning us things that could potentially be used on the portfolio, yet it wasn’t until the summer when we found out the actual requirements and that some things weren’t going to work.

From Katy’s point of view, if the professors knew exactly what was required in saying like “Oh, this could be an example for your Equity and Diversity section.” the preservice teachers definitively could have done a lot better incorporating assignments in the e-portfolio later. However, without a clear version of the requirements of that e-portfolio, the professors could not assign appropriate assignments to facilitate their work for the e-portfolio.

Katy gave an example to illustrate how the course assignments did not get incorporated into the e-portfolio assignment:

Like we did an X theoretical statement last summer but the course requirements were under two pages and you didn’t need any references. It would have been really useful if we could have written a paper with 3-5 pages with references and then I could have used it and developed it more.
Katy made this suggestion because the preservice teachers were required to have 3-5 pages of theoretical statements with references under each theme for the e-portfolio. Katy thought it would be more helpful if the professors could have assigned their requirement in ways that coordinated with the e-portfolio requirements. Similar to Katy, Jane was frustrated by the need to revise the assignments that she had done before. She said:

We didn’t really talk a whole lot about portfolios. Every once in a while we’d have a professor say that they’d be willing to read a rough draft for us, to give us feedback, and that was helpful. They would say “turn in a first draft, a second draft and a final draft and we’ll give you feedback and you can make all these changes.” So we did that and then this summer we needed a new, revised everything and in some instances, they changed everything from what the professors had already given us.

Anna also suggested that the professors should have explained more about how to use course assignment papers to fit into the e-portfolio. She said:

They [faculty] said, “Oh, put this paper up there [e-portfolio], “but no one really knew where to put it, where it was going or what it was for. You know, that would be better if every professor had a clear understanding, then I think it would have been a little more meaningful and a lot less stressful.

Based on these preservice teachers’ opinion, the professors did not have a clear vision of the e-portfolio. The preservice teachers would like the professors (of the methods courses) to tell them directly where the assignments fit into the e-portfolio, as Anna suggested. Another preservice teacher Ella expressed:

Yeah, there was a lot of miscommunication I think. Like some would say oh do this, others say do that. You kind of had to pick apart what was actually what you were supposed to be doing. But they helped as much as possible.

These preservice teachers were disappointed that the professors could not say, “Okay, you’re going to need this piece which you’ll get from this classroom and can be used for this section.” rather than just saying, “Well, you might be able to use this later” (from Sandy’s interview).
One of the program coordinators said that the program faculty had intended to incorporate their course assignments with the e-portfolio project. The faculty agreed at the beginning of the year to do this. However, they had different understandings about how to use the course assignments and how to facilitate the e-portfolio project. This created some confusion and frustration among the preservice teachers as well as the faculty. Dr. Rodger said:

We tried to lay it out in every class that there would be a paper or a project that would be designed and given a lot more feedback and care and that it would become a part of the electronic portfolio. So at the beginning, I would have said to you, “Oh yeah, I know how other instructors are using it because everyone agreed to do this.” But that all seemed to fall apart. So I don’t think that everyone did do it. I think they carefully designed it, but in the end, yes, I would say that I know Dr. Scott really worked on it. Dr. Smith worked on it. I think Dr. Taylor understood at least in the first class that she communicated part of that. I know Dr. Hart did and so I know all of us did. How we managed to mediate that or facilitate it into the electronic portfolio really fell apart. We all were trying to create this opportunity for them to reflect on a certain project and give them more feedback but the way that we understood how to communicate how this would be a part of the electronic portfolio or, here’s what it’s designed for, or, here’s the process. All of that was last year a little bit confusing and people were doing slightly different things and then just like all people, we become frustrated.

Another method course instructor, Dr. Taylor explained:

I can’t say that I was really all that engaged. My focus was really not on helping develop the portfolio. I’m much more interested in do they understand X [content of the methods course], do they have a sort of conceptual map for that, what does X look like for early childhood folks, can they begin to see how X could be a space for social action and social justice and the culturally engaged pedagogy to be there.

Dr. Taylor was concerned more about the course content that preservice teachers were learning. She did not have the e-portfolio in her syllabus as part of course requirements she said:

Actually I didn’t do a lot to make the criteria explicit for the portfolio. My job in my mind was to be teaching X and to do it well and so students’ work was assessed using a rubric or other sorts of assessment that I have but not with the e-portfolio in mind.
Dr. Taylor also emphasized that the preservice teachers needed to reflect on their course papers and should have been able to make the connection to the sections of their portfolio—Learning and Development, Diversity and Equity, Family and Community, and Constructing Curriculum. She felt students should make the connection by themselves. She said:

The assignment [e-portfolios] was that they needed to integrate all four of those themes into this sort of philosophical statement about X and so they [the themes] were already there. Now, how the students used those assignments.....I think what we’re doing, were preparing students to become independent thinkers and teachers who will have to do those types of things on their own. For me it doesn’t serve them well for us to tell them where things [assignments] belong. They, as professionals, have to make those kinds of decisions. This is how I think I will conceptualize family and community. This is how I conceptualize learning and development, whatever it might be. I don’t think we would be well-served to say put this here.

Dr. Taylor argued that the preservice teachers should conceptualize, analyze, and synthesize their learning. Similarly, Dr. Smith claimed:

My main job is to teach them how to teach X and how to plan and teach X. I encouraged them to think about how to use that, the electronic portfolio, but my goal was not to teach them that [the e-portfolio]. That was not an outcome for me. The outcome was to plan more effective lessons.

Dr. Smith did not give any suggestion for how their assignments could be uploaded into their e-portfolio. It was not a course requirement for the preservice to connect and upload course assignments into their e-portfolio. But she did mention it on the course syllabus. She said:

Some of them used their lessons plans for documentation of curriculum development; some of them used it for looking at involvement of communities and family, and some of them used it for documentation of student teaching.... They could choose whatever they wanted to upload. But I recommended. It was a recommendation, not a requirement.
From both professors’ point of view, they mentioned and suggested that work from their courses could be used in e-portfolio, but they were more concerned about how the preservice teachers learned the content in their course. Different from these two faculty members, another professor, Dr. Scott, had a course requirement in his syllabus that related to the e-portfolio. Dr. Scott explained:

We [faculty] had decided at the retreat the year before that everyone would contribute to it [the portfolio]. But no one did it. You know, so I was only doing what I agreed to do with the group. What I wanted them to do was to add their final exam sort of. They [the preservice teachers] were supported to take one of their assignments and write a reflection around it and they never did that in my class because it became so confusing. There was so much confusion and I thought they had been told different things by different people, so I stopped and I said, “Okay we gonna drop the assignment.”

Dr. Scott recognized that there were differences in how faculty members were dealing with the portfolio assignments so he eventually gave up on the assignment he had planned. In another course example, Dr. Oliver did incorporate the e-portfolio with the course assignment successfully, as one preservice teacher, Sandy, described:

Like our X classes, she [the instructor] actually changed her syllabus. So that she said “this would be a good example that you can use with your statement.” She made that up the assignment instead of what she was originally going to require. So I think that was very helpful in that area.

Dr. Oliver explained her course plan during the faculty interview in saying:

I did have the internet and web assignments and had them post the work and research particular things….. I had them research all of places where they were teaching, where they can find services for their students who might be trouble or be academically fragile. They learned about homelessness, health care, child care, or different things like that. I had them to find all of the particular places in those areas so that when they wrote the paper, they would integrate those websites into the paper. So I could actually see that they had found the sources. That was very helpful. They also were able to do some virtue kinds of things in term of a chart. For the portfolio, they included websites; they included emails they got from the places where they emailed requesting information. That was the most recent thing I did.
As Dr. Oliver used technology as a tool to help preservice teachers learn course content, she did not think that incorporating the-portfolio would conflict with her teaching because she would not use technology for anything that wouldn’t enhance her course objectives. She said “I always spent the first 10 or 15 minutes in my class to answer questions about the e-portfolio, even though sometimes it did not relate to the course content.” However, she helped the preservice teachers through the learning process. In assessing preservice teachers’ learning, she continued to explain:

I gave them pretty much, in the course rubric, all the kinds of things I was looking for. And they decided what they wanted to include. So like I said they have the websites and the place they went to…And I told them that I wanted to see the websites. I wanted to see the contact information. I wanted them to write a synopsis paper on that. I went to all of websites because their papers were there. They all gave me URL. I went to their websites.

Dr. Oliver felt the e-portfolio took a lot of time away from the course. However, she believed that “You have to try to figure it out. Our goal is trying to help them all to become a better community of learners and try to be supportive and to help everybody.”

In the data there were clear differences in how the faculty approached portfolio requirements. Two faculty put requirements in their syllabus related to the portfolio, although one of them cancelled the assignment when it appeared that there was confusion among the faculty that was confusing to the students. One faculty wanted students to do the portfolio work independently because she thought this supported the development of their professional development, so she did not include portfolio requirements in her class. However, the lack of agreement among the faculty for incorporating the e-portfolio into the course caused some levels confusion and made the work of e-portfolio difficult.

4.4.3.3 The expectation for directions and requirements for the e-portfolio
“At the beginning we had no clue what it entailed. We knew we had to do it but we didn’t know each section of it. So once we found out what the sections were, it made it easier.”

In the survey data, “unclear directions” was ranked as the third highest disadvantage of developing the e-portfolio (see figure 4.5). There were 50% of the preservice teachers who strongly agreed and agreed but 33% strongly disagreed and disagreed with the statement, “I was given direct instructions for doing my e-portfolio assignments” (see table 4.6).

During the interview, nine preservice teachers declared that they did not receive enough information in order to develop their e-portfolio throughout the year. That is, in the process of developing e-portfolio, the expectation of the e-portfolio was not clearly revealed for these students. As the preservice teachers did not get direct instructions for the e-portfolio’s structure until the last quarter, nine preservice teachers felt “clueless” about doing the work of the e-portfolio during the year.

Sandy said: “I didn’t feel that we were given enough information ahead of time to be able to really work on that stuff before we got the information in the first week of class this quarter [last summer quarter].” Similar notions of insufficient information for developing e-portfolios were described by Christina:

I think it [e-portfolio] would be better if it [the e-portfolio structure] was explained a little earlier. Like professors didn’t know what was going on with it. They just told us put the four domains in there and later we’d get to that. It just really wasn’t explained. It was very confusing. If I had known what was the expectation I could have worked on it and I think that would have been a little bit easier, instead of creating everything at the end.

Christina created the navigational structure in the first quarter technology course. It included Learning and Development, Equity and Diversity, Family and Community, and Constructing Curriculum as the four themes. However, she was confused and did not
know what she needed to do with these four themes. Therefore, she waited until the last
quarter to finish up everything, which made things more difficult and rushed at the end.

Darcy had a similar complaint:

Well, at the beginning we had no clue what it entailed. We knew we had to do it but
we didn’t know each section of it. So once we found out what the sections were it
made it easier but at the beginning we didn’t know the sections so I had - we kind of
didn’t have a clue what we were going to have to do eventually.

Another preservice teacher, Ella, described she was excited to do the e-portfolio.
However, Ella noted “we never got an example of that…we didn’t start talking about that
until a lot later in the program” and therefore she could not do much with it until the
spring 04. If she had followed the M.Ed. students’ handout (see Appendix E) to put each
quarter’s e-portfolio requirements in her e-portfolio, she would have had to take them all
off again because she didn’t understand where things should go. She explained:

I had a better understanding of it spring quarter 04. So I really think over the year I
couldn’t have done anything with it. As I say, the program they had clear
expectations at the beginning of the program saying this is essentially what it is
going to look like. I had no idea of what this was going to look like so I didn’t know
where to put stuff…. Had I known “you are going to have to upload a unit of study;
you need to have documentation”, I would have saved my kids’ works. Like I didn’t
save everything, when we found out, oh, we’re going to need a setting, a study. I’m
like, oh, I’m already done…the expectations haven’t been clear until the end of
spring quarter and I went, oh, now that I’m done it’s kind of late to go back and get
documentation stuff.

Ella’s example indicated she didn’t have rich documentation for her unit study because
she did not have a clear understanding of the requirements as she was in her student
teaching. It was hard for her to get the students’ works and pictures after the fact.

Four preservice teachers, Anna, Jane, Miki, and Vinita, also complained that they
did not have a clear understanding of the e-portfolio structure. Vinita said:

If I know that I was supposed to document it I would have a lot to put on it. And
maybe that would have been meaningful in my teaching. But as it stands right now,
the memories that I have now are much more vivid than what is represented on the portfolio…I gave all my kids’ work back to them. I didn’t think about scanning the works, and keeping them.

Anna did not have students’ works such as writing or drawing after her student teaching either. She did not feel the e-portfolio had the best documentation to demonstrate her student teaching. Miki suggested “if there was just a clearer expectation- maybe at the beginning of the year - for example, at the beginning of the year, if they would have given us that framework sheet that would have been helpful.”

While the preservice teachers felt confused and had difficulties in doing the e-portfolio works throughout the year, at the same time, the program faculty also recognized preservice teachers’ struggles. The professor who taught technology course in the first quarter described the problem during the faculty interview:

I think that at the beginning of the program they [the preservice teachers] are not sure what to expect. They hear me telling them that they will be adding this throughout their program. So they anticipate it…… So I think in one sense the students didn’t really understand, like telling them about it and showing them examples; they don’t really understand what a portfolio is right away and I think after taking my class that they have some sense but it’s not really clear yet to them.

After taking the technology course, the preservice teachers had a vague notion of the e-portfolio but not a solid understanding. In order to solve the problem, the program faculty tried to provide different ways to give the preservice teachers a clear understanding of e-portfolio. One of the program coordinators, during the faculty interview, responded:

Students seem to demand a lot of communication from us in terms of exactly what it is that we want. They are very concerned and so in an effort to reduce their fear and their confusion and around it; we tried to give them more, more, more structure. Well, we initial tried, remember that first meeting that we had? At the beginning of last year [2003 autumn quarter] where we tried to lay out that in every class there would be a paper or a project that would be designed [for the e-portfolio] and given a lot more feedback and care, and that would become a part of the electronic portfolio.
In 2003 autumn quarter, the coordinators of the group provided a handout in terms of each quarter’s assignments for the e-portfolio to illustrate what they needed to do. However, not many preservice teachers came to the computer clinics to complete the autumn quarter assignments. It was a concern that was raised often during the M.Ed. coordinators’ meetings throughout the year. As the faculty realized that the expectations for the e-portfolio were not clear, one of the coordinators sent out an email to the preservice teachers. She wrote:

Dear gray and scarlet students:
I am sending you the addresses of several portfolios for last year. The ones named diversity 1 and 2 are group portfolios accomplished by the Mt Oliver group and the sexuality group that worked with xx (a special project not repeated this year, but thought you would find it interesting). The Cordes portfolio is an example of an individual one…
The portfolios are your capstone project. A capstone project of some kind is required by the Graduate School at OSU for all Masters Students. We favor the e-portfolio over other capstones we have tried over the years (action research projects, long research papers) because in the doing, you also develop or strengthen your tech skills.
I hope too that you will see this project as a chance to really individualize your experience here and to reflect in a meaningful way on your student teaching. You will have lots of time in the capstone course to polish and finish your portfolios…however, you will have less access (maybe none) to your tech GAs. So we encourage you strongly to make sure you have the necessary skills for scanning, digital photos, and file management before Spring quarter.
I hope that you found Bob’s workshop [using digital to document student teaching] helpful. We hope that you will take lots of photos while you student teach. However, when you pick a few for your portfolio, they should be images that really support the story you are trying to tell about your classroom--not just a scrapbook of pictures. We will talk more about all this….just wanted you to remember to finish the skills piece this quarter so that you do not panic in the spring/summer over project…it is a major piece and you cannot graduate without a successful capstone!

Best,
Dr. Hart
ecdiversity1- http://www.coe.ohio-state.edu/rkantor/ePortfolios/ecdiversity1/
ecdiversity2- http://www.coe.ohio-state.edu/rkantor/ePortfolios/ecdiversity2/
cordes.9-http://www.coe.ohio-state.edu/rkantor/ePortfolios/cordes.9/
(Email message 02/11/04)
From Dr. Hart’s email, the preservice teachers were given some level of understanding regarding the e-portfolio work. In the end of 2004 winter quarter, another faculty, Dr. Scott, suggested that the coordinators develop a map of the e-portfolio structure. Dr. Scott described this in his interview:

I got into this last winter and students were very confused about what the e-portfolio was. And I was tried to explain it to them. And finally I said we needed to give them something so that they have something to work from.

As the result, the group of M.Ed. faculty developed an interface for the e-portfolio structure (04/02/04 see Appendix F), and explained it to the preservice teacher in the very beginning 2004 spring seminar. One preservice teacher, Kelly, reflected upon her reaction to it by saying:

Once we got the example, I remember Dr. Hart emailed us the links from the last year. I'm like “fine, let’s go. That is all I need.” The example that Dr. Scott gave us with the layout like have your theoretical statement, your linking paragraphs, your examples. That is fine. We all very briefly did see the web examples. That helped a lot.

From Kelly’s perspective, the clarification/expectation of the e-portfolio from Dr. Hart’s email and Dr. Scott’s demonstration was helpful. In sum, it seemed that the program made efforts to support the preservice teachers along the way. The preservice teachers were assumed to have had a clear understanding about doing their work gradually. However, as preservice teachers had so many things to do during the year, they did not pay too much attention to the e-portfolios development since, in fact, it was not required for each course. Their work for developing the e-portfolio was, as one preservice teacher Mike described:

I went on a little pendulum, if they, last summer [the first quarter] said it [the e-portfolio] was very important and so we felt like, “oh, okay, we really got to get busy; we really have got to get this done.” During the fall it went a little down in importance but in the winter really far down, unimportant. We started to realize we
had to work on it so it kind of went up in importance and then back [on campus] in the summer it was really important and now its kind of that feeling for everybody, just because none of our classes are really focused on it…. so we kind of felt like, you know, the class was the important thing. Getting a good grade in the class, the portfolio just kind of got put on the back burner.

As the e-portfolio was not addressed seriously in all the classes, taking courses was a priority for the preservice teachers, and consequently, they did not work on the e-portfolio throughout the year as the faculty expected.

4.4.3.4 The preservice teachers’ suggestion to the program

“I believe it would be more beneficial if the e-portfolio were an ongoing process that had deadlines throughout the entire program.”

In responding open-ended survey question 36, the preservice provided some suggestions to the teacher education program (see table 4.7).

<table>
<thead>
<tr>
<th>Coding for students’ responses</th>
<th>Students Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide concrete direction and requirements of e-portfolio</td>
<td>S1, S2, S3, S4, S5, S7, S8, S9, S11, S12, S16, S17, S20, S21, S22, S27 (16/27=59%)</td>
</tr>
<tr>
<td>Integrate/incorporate the e-portfolio throughout the M.Ed. program</td>
<td>S1, S2, S3, S4, S7, S11, S14, S15, S17, S19, S23, S27 (12/27=44%)</td>
</tr>
<tr>
<td>Need more instructors to give feedback on the work of e-portfolio</td>
<td>S1, S26 (2/7=8%)</td>
</tr>
<tr>
<td>Extend capstone time</td>
<td>S1, S13 (2/7=7%)</td>
</tr>
<tr>
<td>Have technology course every quarter</td>
<td>S5, S10 (2/27=7%)</td>
</tr>
<tr>
<td>The capstone class should be the only class in the last quarter</td>
<td>S6</td>
</tr>
</tbody>
</table>

Table 4.7: Suggestions for the M.Ed. program (N=27) (S1=student 1)
As revealed in table 4.7, there were two major suggestions to the teacher education program. One was to give concrete direction about the goals of e-portfolio in the beginning of year (59%).

Convey objective/goals of e-portfolios and its requirements clearly and specifically to cohort students early on. We kept getting different instructions throughout the year, it was impossible to get anything done before the last quarter and the capstone seminar (S12).

There was too much confusion during the year about what we were to be doing with our e-portfolios (S1).

Give students the requirements and specifics of project earlier in the year-and don’t change them (S3).

From the M.Ed. students’ point of view, it was possible that having a joint goal was an important element to creating a successful e-portfolio project. They suggested making the objective clear and setting up the rubric at the beginning so that everyone would have the same standards to work on their e-portfolios without confusion.

Another suggestion to the teacher education program was that the e-portfolios needed to be more integrated into the M.Ed. courses (44%). Integrating the e-portfolios into each course would have helped them to develop their e-portfolios in a more meaningful and easier way.

Integrate the e-portfolios throughout the M.Ed. program. We wrote so many papers during our M.Ed. courses, but it would have been nice to really be able to use them (S1).

Having seminar classes support the portfolio by keeping M.Ed. students on track and helping them complete portfolio assignment throughout the program. This way, it is not so overwhelming during summer capstone (S14).

While the preservice teachers suggested that e-portfolios should be integrated into each of the method courses, they acknowledged that if they received different information from different instructors that might cause some problems. Therefore, the
communication among instructors would be an important factor to help everyone stay on track.

Set requirements when program begins and stay with them. Make sure all professors know what they can do and what assignments they can assign that will be helpful to students. Everyone needs to be on the same page (S4)!

Integrating time within courses to go to the lab to upload assignments, write introductions, etc. Having more communication among instructors about [e-portfolio] purpose and layout (S2).

During the interview, while seventeen preservice teachers declared that e-portfolio was not be incorporated into the courses assignments throughout the year, and nine preservice teachers stated that they did not receive concrete directions for developing the e-portfolio, seven preservice teachers provided their suggestions for those limitations, such as only having the capstone course in the last summer, ongoing process of developing e-portfolio, and coherence of curriculum.

Rachel and Lori suggested that the program should arrange curriculum so that they only took the capstone course in the last quarter rather than multiple classes; then they could focus on the e-portfolio project with less stress and produce better work. Rachel said:

It [take the other courses before spring quarter] would be hard but I think it would be a lot easier and more time would be focused in on it [capstone] and it would not be so stressful…. You could put more into it. I’d like to put so much more. In fact I wanted to put extra pages because just things that I wanted to remember and that was really a key part of my learning and there just wasn’t enough time.

In addition to finishing the capstone e-portfolio project, Rachel had other two courses.

Betty also articulated the same struggles:

I think that’s what really made things stressful because sometimes there are other professors who want to give us other work to do. But then again, like we can’t do all this at the same time.
Kelly, Jane, and Emily suggested that the e-portfolio learning should be an on-going process within a coherent plan. Kelly said:

I felt that we learned a lot about technology in the first quarter but were not required to re-visit that knowledge until the following summer. I believe it would be more beneficial if the e-portfolio were an ongoing process that had deadlines throughout the entire program.

Emily suggested:

I didn’t feel that we had enough support……I think we needed either a class throughout or one of our classes needed to talk through the process of what I can put in it and what we needed to start working on already ..I think it would also be helpful maybe to have lab time during the class time to perhaps make that arrangement.

Jane wanted the program to provide a coherent way to integrate the e-portfolio into the curriculum, doing a little bit each quarter. In building a coherent way for developing the e-portfolio in the program, one preservice teacher, Mike, suggested:

I would say is it would take a lot of collaboration from all the professors but what they would need to do is get all the professors together. It would be better that the professors need to get together and kind of brainstorm and figure out which class has a project that they could use the e-portfolio and then for those projects, say for our equities and diversities class, obviously there’s two good examples that I used, or like say, there’s one good example for that example. Instead of asking it to be like printed out and handed in to them so they could grade it have them make the students do it on the website.

Based on those preservice teachers’ points of view, if the e-portfolio were integrated into the curriculum, then the time demands during the last quarter wouldn’t have been such a problem. As one faculty, Dr. Brown, reflected in his interview:

Well one of the problems that we had is these individual classes--technology class, a discipline class, a diversity class…We have math class. There are all these separate things that needed to be integrated, but yeah, we can be talking about diversity while we’re talking about classroom discipline, while we’re talking about technology….so in terms of time we don’t teach holistically. We teach little separate things. Yeah, there is some integration across, but that doesn’t maximize learning.
From the faculty’s perspective, the e-portfolio should not have been an add-on part as one more thing in the course. It should have been a part of teaching and thinking across all the courses, but in reality this was difficult to accomplish.

4.5 The preservice teachers’ learning from developing the e-portfolio process

This section discusses what the preservice teachers learned about technology while in the program and, further, how they transferred their learning from the e-portfolios into the first year teaching. Based on sociocultural theory, learning involves development, change, and transformation. That is, after learning from the e-portfolio process, the preservice teachers’ learning should not stay with a fixed activity such as a created e-portfolio. They had learned specific skills and knowledge about technology integration in education. For this study, follow-up interviews assessed whether these preservice teachers carried out what they learned in developing e-portfolio into their teaching.

Table 4.8 summarizes the data analysis about preservice teachers’ development in terms of their technology competency and the application of their learning of e-portfolios.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Data</th>
<th>31 Survey</th>
<th>17 preservice teachers interviews</th>
<th>9 faculties interviews</th>
<th>6 first year teachers follow-up interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning of technological skills</td>
<td>Q 4, Q 26 Q30, Q 31</td>
<td>16 (+)</td>
<td>1 (−)</td>
<td></td>
<td>3 (+) 1 (−)</td>
</tr>
<tr>
<td>Learning of technology integration</td>
<td>Q7, Q8 Q26</td>
<td>15 (+)</td>
<td>2 (−)</td>
<td></td>
<td>3 (+) 2 (−)</td>
</tr>
<tr>
<td>Learning of creating classroom websites</td>
<td>Q11, Q 34</td>
<td>17 (+)</td>
<td></td>
<td></td>
<td>3 (+) 3 (−)</td>
</tr>
<tr>
<td>Learning of implementing the e-portfolio</td>
<td>Q9, Q 34</td>
<td>6 (+)</td>
<td></td>
<td></td>
<td>5 (+) 1 (−)</td>
</tr>
</tbody>
</table>

Table 4.8: Summary of the preservice teachers’ development of learning e-portfolio
The survey data results in table 4.9 reveal that 68% of preservice teachers responded that they were comfortable with uploading files into their e-portfolios (Q.4), 68% of preservice teachers agreed and strongly agreed that they “acquired sufficient technical skills to help their teaching” (Q.7), and 26% of preservice teachers strongly agreed and 42% agreed with the statement: “I learned using technology to enhance my teaching and learning” (Q8). A majority of the preservice teacher (84%) agreed and strongly agreed that they “know how to create an e-portfolio in the future,” 16% (strongly agree) and 32% (agree) of the preservice teachers understood e-portfolios as a cultural tool to mediate teaching and learning. As all of the students reported that they did not have previous experience with e-portfolio before entering the program (see table 4.2), these data demonstrate a significant amount of learning for these students.

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Strongly agree (%)</th>
<th>Agree (%)</th>
<th>Undecided (%)</th>
<th>disagree (%)</th>
<th>Strongly disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4. I was comfortable to upload works into the e-portfolio</td>
<td>23%</td>
<td>45%</td>
<td>19%</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td>Q7. I acquired sufficient technical skills to help my teaching.</td>
<td>19%</td>
<td>49%</td>
<td>26%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Q8. I learned about using technology to enhance teaching and learning</td>
<td>26%</td>
<td>42%</td>
<td>26%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Q9. I understand e-portfolio as a cultural tool to mediate teaching and learning</td>
<td>16%</td>
<td>32%</td>
<td>35%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>Q11. I know how create a e-portfolio in the future</td>
<td>36%</td>
<td>48%</td>
<td>13%</td>
<td>3%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 4.9: Percentage of preservice teachers’ development of e-portfolios
In responding to survey questions 30 and 31, preservice teachers compared the skills they had before and the skills they had after developing e-portfolios. As can be seen from figure 4.6, preservice teachers’ technology skills developed a lot as a result of doing their e-portfolios. Especially in the items of learning to use FrontPage to design webpage, publishing web on the Internet, and creating a web-based lesson show significant difference between before and after. As these preservice teachers did not have prior experience with developing e-portfolios, they considered learning about technology while developing an e-portfolio as a significant advantage of their portfolio process (see table 4.2), Developing the e-portfolio provided the preservice teachers a chance to practice technology skills.

![Figure 4.6: Percentage of technological skills preservice teachers developed](image)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>upload/download file and pictures</td>
<td>scanning/ saving images</td>
<td>using digital camera</td>
<td>PowerPoint presentation</td>
<td>FrontPage</td>
<td>Excel</td>
<td>designing webpage</td>
<td>publishing web on the Internet</td>
<td>creating a web-based lesson</td>
<td>integrating technology into lesson plans</td>
<td>other</td>
</tr>
</tbody>
</table>

Figure 4.6: Percentage of technological skills preservice teachers developed

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Figure 4.7 shows responses to survey question 26 about what they learned from developing e-portfolios. The level of acquisition of specific technological skills (35%), knowledge of e-portfolios (30%), and knowledge of technology integration (23%) were ranked as the three most important things that preservice teachers learned from developing e-portfolios.

Figure 4.7: The three most important things learned from e-portfolios

The results shown in figure 4.7 support the contention that the preservice teachers valued the learning that resulted from working on their e-portfolio and that it enhanced their technology skills and knowledge of technology integration. In other words, the
preservice teachers developed some level of technology competency by developing their e-portfolios.

When responding to the first open-ended survey question of how they would apply or adapt the e-portfolio in their future teaching careers, table 4.10, their responses were coded in four categories of responses: 1) not continuing to use e-portfolios (40%), 2) use the e-portfolio as a tool to share with others (30%), 3) keep using the e-portfolio as documentation of their teaching experience (30%), and 4) apply the technology skills they had learned to build class website (22%).

<table>
<thead>
<tr>
<th>Coding for students’ responses</th>
<th>Students Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Will not continue to use my e-portfolio.</td>
<td>S1, S3, S4, S5, S8, S10, S20, S21, S22, S23, S27 (11/27=40%)</td>
</tr>
<tr>
<td>2. Link it to class website for parents to view to understand my teaching philosophy. Resource for others (principals, parents, co-teachers,), job interview.</td>
<td>S6, S7, S11, S12, S14, S15, S16, S19 (8/27=30%)</td>
</tr>
<tr>
<td>3. Continue to add lesson plans, experience, and resume. Use it to reflect on my on-going growth and change in teaching.</td>
<td>S2, S6, S9, S13, S14, S17, S18, S19 (8/27=30%)</td>
</tr>
<tr>
<td>4. Will use my new technology skills to build a classroom website.</td>
<td>S1, S5, S15, S16, S24, S26 (6/27=22%)</td>
</tr>
</tbody>
</table>

Table 4.10: Plans of using/adapt the e-portfolios in future (N=27) (S1=student 1)

Table 4.10 shows that 16 of the M.Ed. students planned to use the e-portfolio they created in the M.Ed. program in the future, and 11 responded that they will not.

Five preservice teachers explained that they did not plan to continue to use their e-portfolios because the server space would only be available for one year after graduation.
Due to this reason, some of preservice teachers did not feel it was worth it to keep working on it.

I will probably not use the e-portfolio in the future, especially since it will only be kept on the server for a year (S3).

I will be unable to because it will be deleted from the server (S4).

Two preservice teachers did not plan to use their e-portfolio because they viewed the e-portfolio as primarily an assignment that they were forced to do. Therefore, when the project was over, they did not have an interest of continuing it.

I don’t think I will use it at all. I already have a job. It doesn’t reflect what I want it to. I was forced to put certain things on it (S8).

I don’t plan on using it because I primarily did it because it was a course requirement (S27).

However, there were 16 preservice teachers who planned to use the e-portfolio they created in different ways. As indicated in table 4.9, 30% of 27 preservice teachers valued the e-portfolio as a tool for sharing their learning with others, for future job interviewing, or as a resource tool for others to understand their education experiences and educational philosophy.

I may refer parents, supervisors, and/or co-teachers to my site for more information about me, my education, and my educational philosophies (A12).

I hope to be able to link it to my personal class website for parents to view at anytime to better understanding my pedagogy (A7).

In my future career I plan to use my electronic portfolio at job interviews and to share my M.Ed. experience with others (S15).

Thirty percent out of 27 preservice teachers planned to update their e-portfolios, including their lesson plans, their teaching experiences, and to document their on-going growth.
I plan to find an available space after the 1 year time period. Then I will update it with lesson ideas and belief statements (S9).

For right now I am leaving it as it is. However, documenting my future work as a teacher with photographs and written descriptions is a nice idea that I could carry out if I decide to (S13).

And there were 22% of 27 preservice teachers who wanted to apply the technology skills that they learned to build a classroom website.

I will probably use my new technology skills to build a classroom website depending on where I will teach (S5).

I may use the design to help me create a weekly newsletter format (S24).

I will be updating it as my career progresses. I will use it as a resume (S18).

The survey data related to the preservice teachers’ development of developing e-portfolio indicated they had future plans for using it. The development of their confidence in integrating technology into their future teaching was discussed more in depth in the interviews.

4.5.1 The preservice teachers’ learning of technological skills

During the interviews, the technical skills that they learned were discussed. Except for Darcy reporting she did not learn anything new, sixteen preservice teachers responded that they had learned a lot of specific technology skills such as using PowerPoint and Excel for an educational purpose, taking and downloading digital pictures, inserting pictures, and creating web pages.

4.5.1.1 Using PowerPoint, Excel, and FrontPage for educational purpose

“I believe my experiences creating the e-portfolio helped me to feel confident in creating an informational website.”

Emily pointed out that before walking in the program she only had a little knowledge of technology. However, after she finished the e-portfolio, she knew how to
use PowerPoint and Excel. She could create a website and upload pictures. She felt she
learned a lot about technology. She said:

I learned how to use Microsoft Excel. I have learned how to use the Power Point, how
to make website, how to make links to certain graphics, download pictures
from a camera onto a website. I have learned a great deal about it because coming in
the very first week, I knew only about the internet - and that was basically all I had.

From Emily’s point of view, she acquired technology skills from developing her e-
portfolio. She reported that she had used PowerPoint to create a rainforest game for K-3
students

(http://www.education.osu.edu/classes/hartleyk/presentation_software_project.htm) and
used Excel for a first grade “Money Value Activity” spreadsheet

(http://www.education.osu.edu/classes/hartleyk/spreadsheet_project.htm). Kelly
demonstrated that she had integrated her learning into assignments for her courses. She
said:

Ah, I learned a lot. I didn't know anything about the Excel. I had no clue. The only
time I used it before was in the high school. At that time I had no clue about any
kind of calculation, tables, or those kinds of things. So I learned further content here.
PowerPoint, you know I had seen it before. I did work it once in an undergrad
presentation, you know. In P&L 791 I made it into a game, PowerPoint, a rainforest
game and made it more fun and I thought I integrated that.

For Kelly, the learning of e-portfolio not only gained knowledge of different programs
but also how to handle various problems related to technology. She stated:

I think so [became comfortable with computers] because I knew a little bit more
about how to run a computer. Having like… I have to enter a classroom website. I
feel like I have to deal with server problems. Yeah. I feel a lot more confident
integrating the internet and a little bit more about “how” various experiences should
work because you just don't want one technology experience. Cause, like, use it with
Excel and I think lots of that kind of knowing, all that broad range stuff like that.
Kelly valued many different things she had learned. She indicated her learning included more than just one activity. Similar to Kelly, Christina reflected on her learning of FrontPage. She said:

Yeah, in the beginning - I never have used FrontPage. I didn’t even know where to start it. It was really, really hard for me… [after finishing the e-portfolio] I definitely have learned a lot about technology. I knew how to use the Internet and Microsoft Word, something like PowerPoint and Excel, and I learned how to do a lot of those things. I never had done FrontPage and never ever had done anything like that, even shooting a digital camera and uploading pictures from the Internet. And it was all new to me, like cropping pictures, I never knew that. It was all new.

Through developing the e-portfolio, Christina and other preservice teachers obviously gained a greater knowledge of webpage design than they had before.

4.5.1.2 Using digital camera for documenting learning

“I never used digital pictures before the e-portfolio at all and we have the digital camera at my school. One thing I have done is I have taken pictures of students with the digital camera and printed them all.”

In the interview at the end of the program, Beth indicated that she valued not only learning about FrontPage but also learning to use a digital camera. She said:

I really learned how to use FrontPage a lot. I learned how to use my digital camera, and add pictures and post pictures and scan things. I learned a lot about it because I didn’t have basic knowledge of it and basic programs. Just like downloading pictures from a camera and into my computer and burn CDs of my pictures and stuff.

Beth noted that she learned a lot of technological skills and identified herself as a visual person while she developed her e-portfolio. She liked to use photos to illustrate her statements. She felt that photos made her learning story vivid. She said:

I think it [photos] would definitely make it different. You can write words and you can flop them up there but they don’t mean anything to me unless you can see pictures. Because I felt like when I read a word like “community church”, I want to see that church. If I read about the elementary school, I want to see pictures of that school.
Beth practiced a lot with the digital camera and uploaded many pictures to her e-portfolios. In the follow-up interview, she responded how the learning experience of e-portfolio facilitated her first year teaching:

I learned all of those programs. I have learned how to update website and upload pictures properly. I think my parents can go to get pictures from there. They can view what their kids are doing and they do not have to come to school to see the pictures.

As Beth created the classroom website, she applied the skills she learned to upload the class pictures into the website.

Similar to Beth’s experience, Sandy and Miki indicated that they had not done things like hyperlink, digital picture before developing their e-portfolios. They were only familiar with e-mail, and Microsoft Word. Miki described:

At the beginning I didn’t really know - I mean I knew enough to get by through college and e-mail, writing papers, but as far as anything digital or web pages, I had no idea. So yeah, I feel like I have learned a lot about that.

From Miki’s experience, the designing webpage and taking digital pictures were total new things to her. By developing the e-portfolio, she stated that she had learned a lot of those skills. In the follow-up interview, Miki, who got a job teaching in a nearby district, talked about how she used digital camera in her teaching to demonstrate the skills she learned from developing the e-portfolio while she was in the program. She said:

I never used digital pictures before the e-portfolio at all and we have the digital camera at my school. One thing I have done is I have taken pictures of students with the digital camera and printed them all. At the beginning of year I did this kind of self portrait thing. On a piece of construction paper, I put the digital pictures and underneath that with paper they wrote about themselves. So I got them to hang them up in the hall. It looked really nice. So I would say that since I never have done anything with digital camera until my e-portfolio. I felt comfortable with it.
Because on her e-portfolio experience, she walked out the program with new technology skills. Once she got into a teaching job, she applied the skills in her teaching. She felt comfortable using the technology and proud of her work.

4.5.2 The Preservice teachers’ learning of confidence in technology integrating

In the survey data, 63% preservice teacher strongly agreed and agreed with “I acquired sufficient technological skills to help my teaching.” These preservice teachers also strongly agreed (26%) and agreed (42%) with the statement: “I learned how to use technology to enhance my teaching and learning” (see table 4.9). “Knowledge of technology integration” was chosen as one of three most important things they learned through developing the e-portfolio (see figure 4.7).

During the interviews, the preservice teachers demonstrated that they had learned specific technology skills, fifteen of seventeen reported that they felt more confident in using technology for future teaching. For example, Christina stated that the experience of developing the e-portfolio helped her to understand how to integrate technology into her teaching and learning. As technology is valued in education currently, she thought she was prepared to teach with technology. She responded to my asking the question “Did the experience of the e-portfolio contribute to your teaching and learning?”

Yeah! Because I think the technology is so big now in the schools. I think I need those skills going into an elementary school so I can teach kids. You always want to get bigger and better so I think it has helped me understand the basics and things like that that I can integrate in the class.

4.5.2.1 Using technology to enhance teaching

“I think that maybe work with my e-portfolio helped me to be comfortable with thing in my jobs. You know just things related to technology.”
Anna stated that since children are excited about and like computers, she planned to apply what she had learned in developing e-portfolio into her future teaching. Different from those teachers that she observed in the student teaching who did not have experience with technology and were shy about using the computers, Anna believed the e-portfolio experience provided her chances to learn various things about computers. She was confident about using computers in her future teaching. She said:

I learned about PowerPoint and things that I wasn’t familiar with before. So I feel more comfortable in helping the students with technology as well as branching out further…some teachers shy away from that because they are not familiar with computers or it is something that they are nervous about because they do not have that experience. Now I feel more confident in this generally, you know, how to operate a computer. Just seeing the different things, I learned something that I didn’t know about before.

As Anna had a hand-on experience in developing e-portfolio, she was not afraid to work with computers in general; furthermore, she wanted to help students to learn with technology.

In the follow-up interview with first year teacher Katy, she pointed out that technology is part of her school life. The teachers in her school could not work without using technology. She said:

Yes, we must use technology to be a teacher at this school. We use the computer everyday to fill out time sheets for our working hours. We use computer programs to create classroom web pages. We use FileMaker to create conference reports and to store important data about each student. Overall, you must be technologically savvy to be a staff member here.

From Katy’s point of view, the teachers in her school are expected to be confident using technology: “I have used overhead projectors, lap top computers and other technology resources as teaching tools to enhance the students’ experiences.” Katy felt prepared to use technology.
Another first year teacher, Miki expressed how the experience of developing e-portfolio helped her to be more confident with technology as she began her first year teaching. She said:

I think it [the experience of developing the e-portfolio] gave me a lot of confidence for using technology. … You know when you start a job and you felt you are so busy teaching and you do not know how you can do so much work. I think being comfortable with technology is an aspect of the job that kind of gives you help. You know, there is a lot with technology that they have in my school. But you don't always get trained well with it, like you start with new job, like the email system, every classroom has a website; you know there is kind of a lot to learn. I think when you are felt comfortable with it, that you can begin with more confidence. I felt comfortable kind of getting on the computer just experimenting, kind of teaching myself because no one teaches you how to use all software and all the programs. So I think just having the background with technology can help the first year teachers in general.

Miki felt confident about technology. She gave an example of how her confidence with technology helped her in her first year of teaching. She said:

I made the report card, I think that is related to my learning of e-portfolio, I did report cards online, it is the first year that my district did report cards electronically. You could do it through the on-line or you can do it using paper and pencils. I choose to do it electronically because I felt so comfortable with technology and those sorts of things. I think it will be easier for me to do that. I am the only teacher from my grade level to do that. I think that maybe work with my e-portfolio helped me to be comfortable with things in my jobs. You know just things related to technology.

4.5.2.2 Teaching students to learn with technology

“We have computers in the classroom but some people just put kids in front of computers. Kids have contact with it. I try to make it more meaningful.”

Based on the learning experience of e-portfolio, the preservice teachers no only used computers to enhance teaching; Betty asserted she would like to teach her student to learn about technology itself. She said:

I will use it to teach students with new PowerPoint presentations, to teach subjects to the kids and also how to use computers, how to do their own presentations and how to apply things from the web themselves. I want them to learn, like, daily use of
computer systems for them to do, like, typing their papers, frequent use of computers to do their writing as a normal thing, as writing a paper, and other thing to teach.

Betty wanted students to be able to learn with technology and had a strong concept of technology integration. She declared that her learning from the e-portfolio had helped her learn but would also help her students learn. She said:

Like I said, I learned that I definitely knew how to integrate technology in the classroom but not only teaching through technology. Not only me presenting a PowerPoint presentation to my class and representing something on a website or - It’s more like I actually understood how the students can be involved in it. How they - I can do lesson plans where they will be able to get on the internet and create their own presentations. I understood how that could happen.

From Betty’s point of view, technology could be used for students’ involvement and students could construct their own learning and make more learning meaningful through technology.

Mike pointed out that teaching kids to use the internet to search for information was something he would like to do in his future teaching. He said:

If I have a class that had a computer and internet and things I could definitely use that to my advantage. I’d use the computer as a tool just like I’d use an encyclopedia or dictionary or book, you know, definitely something the kids could look at. You’d look through the web and find some information and read there and stuff. It’s just another tool that we could bring into the classroom.

In follow-up interviews, one first year teacher, Miki, explained how she taught her first grade students to use computers to learn such things as drawing and typing things in her classroom. She wanted students to begin to be comfortable with technology (computers). She said:

Right now, every day I have a computer center, I just have kids kind of experimenting with things on the computer… I have them go on the computer and have them to go to Kid Pix. They can just do the illustrations. You know I want them to get comfortable with using the mouse and using the keyboard. Then, I have them play around with the font and the size and try to type a sentence. You know
first graders are kind of developing their skills. I have them write the story "Goldilocks with Three Bears" and all of them use Kid Pix to do the illustrations for the cover.

Similar to Miki, Beth, another first-year teacher, taught her students to do PowerPoint presentations. She believed the experience of developing the e-portfolio encouraged her to use technology in different ways. She described:

I use everything that I learned. I use it one way and another…For the project we did about creation or the project about a book we read, instead of doing regular book reports, they made PowerPoint book reports…We do a lot more social than science like research using different websites that have different information. We have done spelling games, writing letters to the President. I also have them to save their work on a disc. Each student has one disc to save their work. I am teaching them to use technology to collect their work and they know when they type things they will save them. Then we can keep track of them and kind of be watching their progress and changes.

Beth had learned a lot from developing her e-portfolio and wanted her students to learn with technology in meaningful ways. She continued to say:

We have computers in the classroom but some people just put kids in front of computers. Kids have contact with it. I try to make it more meaningful. I feel like I have a lot more ideas about to how to integrate technology.

Beth appreciated the teacher education program for preparing her well. She stated:

With changing times you have to know how to use technology. Now the districts try to improve education a lot and they have computers. They will not to hire you if you do not know how to do that. If I did not learn it there, where could I learn? How can I get along without that? I think if we want to have teachers prepared for changing times, we should do that [the e-portfolio] even if we work with little kids. I mean I work with fourth graders, but they are more proficient than I am, in fact they are getting better younger and younger. They’re goanna to be ahead us.

Miki, Katy, and Beth’s’ examples demonstrate that these preservice teachers’ learning from developing their e-portfolio was transferred into consequent activities in their first year of teaching. It demonstrates that the learning of e-portfolio in the teacher education program was an effective way to develop their technology competency.
4.5.2.3 Disagreement on developing technology competency

“They taught us how to teach reading. They taught us how to teach social studies. But they did not teach us how to teach technology.”

The data from these particular preservice teachers showed that they had skills and knowledge of technology to use it in their teaching. However, another preservice teacher, Jane, claimed she still did not feel comfortable with using technology in her future teaching even though she had the experience of developing an e-portfolio. She argued that she could not apply her skills in her future teaching because she practiced the skills only once for finishing her “assignment.” She was not sure if she could do it again. She said:

In terms of technology integration I don’t see how it’s helped. I’m sorry. I think that the PowerPoint presentation and the spread sheet helped directly for the classroom and we had that at the beginning of summer last year. But quite honestly I don’t even know if I could do it again…. you do it once and you forget it quickly…I don’t know if I can [apply those skills in future teaching] - again, it’s not something I could not do over night. I don’t feel uncomfortable with it.

Vinita also believed that learning from developing the e-portfolio did not help her to know how to integrate technology into her teaching. Instead of learning technical skills for herself, she would rather have liked to learn how to teach technology. She said:

Asking us to do the e-portfolio did not teach us how to teach technology. In our program, they taught us how to teach math. They taught us how to teach social studies. But they did not teach us how to teach technology. Especially if you think – yes, you have a computer lab sometimes, but a lot of time you are with the kids, like you have three computers in your room. Not all the teacher knows how to incorporate it and tie it in with curriculum.

Vinita was disappointed that she did not learn directly about technology integration. She felt that what she had learned were technical skills that did not help her to teach with technology. Therefore, during her follow-up interview, she claimed that she did not
implement any part of her learning from the e-portfolio process into her first year teaching. She said:

We [the schools teachers] only have to update the protocol and then everyday my kids come in and look at PowerPoint presentation. It is just one slide; it is not a continuing presentation on the TV screen. And sometime they take a turn to do the school computer program.

She declared that her school does not require the teachers to integrate technology into teaching. Therefore she did not use technology in her teaching very much. She said:

In our school we have two computer assistants to help us and high school students who are learning how to be very good at computer software. Over the summer, they actually came to work in the district. I have every resource, if I want it. We have digital cameras and scanners and all of that stuff, but not technology integration. They expect us [teachers] to keep up the protocol. And I think they want the kids to have computer skills. But the classroom teachers do not…it is really up to their choice. No one brings this over to you and says you need to put the kids in front of the computers.

Even with sufficient technology resources in her school; the teachers were not expected to use it very much. Vinita, as she described before, did not incorporate her three class computers into her curriculum. Mostly, her students took turns to use them for short time periods. The students were familiar with technology because of once a week computer class. Vinita claimed that she had not learned how to integrate technology into her teaching through the experience of developing the e-portfolio in the teacher education program.

4.5.3 The preservice teachers’ development of creating classroom websites

The results from the survey indicated that 84% preservice teachers strongly agreed and agreed that they “know how to create an e-portfolio in the future.” During the interviews, the preservice teachers declared they had learned specific technological skills in developing their e-portfolios. Seventeen presevice teachers most valued the skills
related to web page design because they did not have any prior experiences with it.

Except Jane who said “I do not know if I can do it again or not. I finished everything so quickly. I even don’t know I remember it [the process of creating the e-portfolio]”, the other 16 preservice teachers reported they would like to create a class website in the future. For example, Darcy reported that she was proficient in designing websites after finishing her e-portfolio. She stated she could build a class website and even help her future colleagues or the school to build a website. She said:

Just again, I will do the web site for my classroom and maybe help out teachers in my school so that like some of the classes - I was in Columbus Public and hardly any of the web pages were put together for the schools. They were just blank. So just being able to maybe teach the teachers at my school and the administration like how to put things on the web site, so that the school’s web site can be more detailed.

Another first year teacher, Katy, who teaches in a private elementary school in California, agreed that the learning experience from the e-portfolio helped her to create a class website. She said:

It [learning experience of e-portfolio] helped my knowledge of creating web pages. Currently, I have a webpage for my classroom and I believed that my experiences creating the e-portfolio helped me to feel confident in creating an informational website. I have used my web page creating skills to create an informational website for the students, parents, family and friends to look at. I have created conference reports about my students for parent-teacher conferences on the computer.

4.5.3.1 Creating a class website for communicating with parents

“They can view what their kids are doing. They did not have to come to school to see the pictures. They also can email me through it. We use it as a communication tool.”

In the interview, Anna declared that creating a website was not difficult because of her own experience in creating the e-portfolio. She planned to create a classroom website either for parents or children to use. She said:
I think that - once again, developing that [her e-portfolio] I realized “Oh, It’s not that hard. It can easily be done.” So therefore I feel a little more confident in creating one of these for my family to look at or having children to work up theirs or, you know.

Anna realized that a website could be used for students’ learning. Mike also admitted that building a classroom website wasn’t a scary thing for him after he finished the e-portfolio. He said:

I’ve never built a website before so now I literally know, before, it was kind of like, a scary thing, but now I’m not afraid. You know,…I’m feeling I can create a website I can post updates on it so parents can look at the website and constantly see what’s going on in the class and use it like that, kind of, as a means of communication, not for my e-portfolio, per say, but developing the e-portfolio made me more proficient in building my website.

Mike’s future planning related to technology included thinking about a website to communicate with students and parents. From Mike’s point of view, a classroom website is a means of communication because parents can contact him conveniently. He explained his belief in saying:

The parent’s might be scared, you know, parent/teacher conferences, like a suspension or anything but when I put stuff on the website it might make them feel more at ease, you know, they can look at it without it being offensive. I can put my email address and they could just comment or send questions to me and I can edit them through the email, a little more laid back… the parents might be more personable with me, they might feel guarded a little bit.

In his future teaching, Mike believed that he could use the class website to build relationships with parents in order to help them become more involved.

Sandy, as a parent of three children, had had the experience of using a class website from her children’s school. She said:

My kids’ one teacher did have a website and it was so helpful because she would have assignments posted for the weekend and there was going to be a lot of math homework for Tuesday night, and discipline would be Wednesday night.
Based on her experience, she knew that a class website could keep parents involved and help the children learn. It is a very helpful tool for parents. She said:

[On a class website] I would just share like what’s going on in my classroom. Like what our assignments are, things that are happening, and units of study. Just to kind of keep parents inform.

In the follow-up interviews, Beth and Katy stated they used a class website to share class information and communicate with the parents. Beth said: “They can view what their kids are doing. They did not have to come to school to see the pictures. They also can email me through it. We use it as a communication tool.” These students and two graduates considered a class website as a place for the parents to connect to their children’s learning and the teacher.

4.5.3.2 Creating a class website for facilitating teaching and learning

“I have a classroom website but I make it useful and make it interactive where kids can go to find things.”

Beth believed that she could use a class website for professional purposes. A class website might include the calendar, the weekly assignments, and the homework.

I am going to try to make a classroom website and make it professional so that parents can use it. ..a website or skills for them to practice at home and have the calendar on there or maybe post the weekly assignments on there, and maybe the homework just for them to see them and maybe not just for them to copy but if something gets lost then that is where they can go online and check it.

Beth viewed the class website as not only a communication tool but also as a way to enhance students’ learning. She would create a class website both for communicating and learning purposes.

It appears from this data, that preservice teachers learned specific technological skills and felt comfortable to create a classroom website after they graduated from the
teacher education program. The preservice teachers had the capacity to carry their skills into information and activities for parents and students.

In the follow-up interviews, two out of six first year teachers applied what they had learned in the teacher education program in creating the classroom website. Katy and Beth asserted that the learning experience of e-portfolio facilitated their creation of a class website. Beth, who teaches in a private elementary school, claimed she is the only one in her school who knew how to create the website. Even though there was a person to help teachers make their websites, Beth decided to do it on her own because she had had hands-on experience with her e-portfolio. She believed she was capable enough to do it on her own. She said:

I actually learned more than any of my peers in my school. I am the only one who knows how to do the website. …There is a lady who helps us. They send their information to her and she makes their websites. I am the only one who started it form scratch to make my own website and I update it constantly.

Beth was proud of her ability to upload pictures to create her class website but also to make the class website a professional resource for parents and students. On the class website, she uploaded students’ pictures, lesson plans, and spelling word list. Her students could practice or study the lesson/test before and after class. Also parents could find helpful information for helping their kids to learn. She said:

We use it [class website] as a communication tool. I also have spelling word lists on there. I have a unit we did and the units we’re goanna be doing in the future. Students can look at it and their parents look at it before. So they start working on the work before we get to the test. It is always a place they can go to look at and find the test information.

Beth also incorporated her website into lesson planning. She explained:

Like when we go to the technology lab I want then to go to certain links, I can put these on the main page and they can get on the website and click on it to read or do some typing. We play games together and sometime do quiz we have found.
we emailed letters to the President and kids felt amazed and excited [about social study].

Beth used class websites in a meaningful way to facilitate the teaching and learning. She was proud to share that “I have a classroom website but I make it useful and make it interactive where kids can go to find things. . . . It has become useful good for parents, children and the teacher.” Her learning from the e-portfolio was transformed into consequent activities in her first year of teaching.

Similar to Beth, Katy explained that the experience of developing e-portfolio not only gave her the confidence of creating the classroom site, but also helped her to make the classroom website more meaningful. She said:

I use the classroom web page as a way to show them [the students] their work and pictures of themselves working in the classroom. The classroom website functions as a way for the children to take pride in what they do and as a tool for families and loved ones to be updated on the classroom’s current events.

Another first year teacher, Miki, did not create the class website by herself as Beth did. During the follow-up interview, she stated that in her school district, every classroom has a website. However, there is a special mediator who maintains the classroom websites for teachers. The school does not require teachers to make websites by themselves. Miki plans to build a better class website next year. Since there were so many things to do that she felt she could not pay the attention to the website in the first year teaching. She said:

I think my school only has three teachers who have done websites for their classroom because it is optional. I think I would like to do it eventually….I think I’d like do that next year because this year is just kind of put things on it. There are so many things to do this year.

Miki did not need to maintain it on her own, yet she did verify that she was capable of producing a website on her own and plans to do one in the future.
Ella and Emily also did not create a class website yet because Ella said “Teaching itself takes up all of my time with weekly planning and getting ready for daily activities and lessons.” However, she stated that she still remembered the skills she had learned through developing e-portfolio and she plans to create a class website next year. She said “I would like to set up a classroom website at some point, and have them use it as a resource.”

Among the six follow-up interviews, one of the first year teachers, Vinita, did not agree that the learning of developing the e-portfolio helped her to create the class website. Although she admitted that the experience of e-portfolio increased her confidence with using technology, she did not believe that it could be applied into the work of classroom website. In Vinita’s school, the teachers are required to maintain class websites. However, the class website is under a protocol in which webmasters set it up and teachers fill in the class information. Vinita did not view the class website as a challenge that requires confidence with technology because it is so easy for her. She asserted:

It [class website] is not something that I used my technology knowledge for. I do not need to use what I learned before. It is completely separate, they set it up and you fill in it. Just like Word documents. You can get it and create with it. But for me, I keep it very simple and very basic and that way it is easy for parents to visit and I do not have time to sit there and play with website…The class website uses such basic computer skills and is in a different webpage program. It is not FrontPage. So really, I do not think one really coincide with other. I mean, it gives me the confidence ...to know that I could create a website. But the actual thing I did on my website is different….I do not think it is necessary for me to feel comfortable to do that. There are teachers who are fifty in my school who don't have the technology skills and knowledge that I have and they are using the protocol just fine. And they didn’t do e-portfolio.

Because of the district’s format, Vinita could not use the skills she learned from developing e-portfolio. Vinita did not think her experience of developing the e-portfolio
made her work with the classroom website easier. As she observed in her school, even
the teachers who do not have any learning experience with e-portfolios can have a
website. Therefore, Vinita did not see it is necessary to have the e-portfolio experience in
order to create her class website.

4.5.4 The preservice teachers’ learning of implementing the e-portfolio

As preservice teachers perceived the e-portfolio as documentation, reflection, and a
sharing tool, the potential ways they would use it were explored. The survey data reveals
48% preservice teachers strongly agreed and agreed with the statement: “I understood
the e-portfolio is a cultural tool to mediate teaching and learning” (see table 4.9). There
were 40% preservice teachers who would not continue to use the e-portfolio they created.
However, there were 30% preservice teachers who planned to implement the e-portfolio
as a resource for others to understand them, and 30% preservice teachers would continue
to add lesson plans, experience, and resume their on-going growth and change (see table
4.10).

4.5.4.1 Implementing the e-portfolio as a teaching resource

“I have used it as a reference for lesson plans and I use it as a resource for my
philosophy of education.”

In responding to interview question 7, six preservice teachers talked about how they
would use their e-portfolio as a teaching reference in which they could look back and
remind themselves what they believed about teaching and learning. It was also a place
that they could get some ideas for lesson or unit plans. Furthermore, they could use it to
check their growth. Christina said:

I will look back at it [the e-portfolio] - my philosophy - things that I already believe
in. Like the learning and development two examples that I used for hands-on
experiences and cooperative learning. And I just think, I really think that I
emphasized that in my portfolio and it is something I will remember and will put in to my classroom very, very frequently.

At the time of the interview, Christina had a teaching job for next year already. She wanted to make sure she included hands-on experiences and cooperative learning in her every day practice. Another pre-service teacher, Anna, thought the portfolio “was a reflection of my growth over my masters program.” She did not plan to update it. However, Anna planned to use it for teaching and instruction. She stated:

I think just once again all those components that I talked about - I’ll use those in my teaching and instruction and some of the things that I believe and I can learn from them - make sure that that’s in there [her classroom]. If I wrote it and put it on my web page, especially the philosophy statement that is something that I believe. And it’s going to be in my everyday instruction.

In the follow-up interview, six first year teachers were asked how they maintained their e-portfolio or continued to use it as a tool for the professional growth. Except Beth, five of them responded that they had not had the chance to update it because they were very busy teaching. However, Ella and Katy replied that they used it as a teaching reference to reflect on their teaching. Ella said “I had all of my philosophies in one place in an organized fashion, which made it easy to go back and refer to my past year of learning.” Similar to Ella, Katy stated that “the e-portfolio has served as a reference in my teaching, which I use for lessons and to help me not lose sight of what teaching means to me.” Katy was teaching the same level of students (kindergarten) as her student teaching. She explained:

I have used it as a reference for lesson plans and I use it as a resource for my philosophy of education. For example, I completed a plant unit in my current classroom and I looked to my plant unit on the website to give me ideas.

Beth also utilized some units from her e-portfolio to teach the students. She said, “I cannot wait to teach the whole unit again. It is a reference place for teaching my kids.”
Unlike Ella, Beth, and Katy, Miki did not use her e-portfolio as a teaching reference because “my student teaching was the third grade last year, so, I think if I was teaching third grade this year [she was teaching first grade] maybe I would have to use it as a teaching resource.”

### 4.5.4.2 Implementing the e-portfolio to introduce herself

“That gives them a place to go to learn about me.”

Three first year teachers used the e-portfolio to introduce themselves. Emily put the e-portfolio URL on her business card. Katy said, “I have directed parents of students to my website so they can get to my educational philosophy better.” Beth made a link between her e-portfolio and the class website. Beth also updated her e-portfolio after she graduated from the program. She said:

> I have a school website and I made it as an attachment, a link, so that my parents can go to the link and can see what I have done and my kids can go and look and learn about kids I’ve had before and my parents can see what I have learned, my beliefs and everything. That gives them a place to go to learn about me.

For those three program graduates, they believed that their e-portfolios can make people know them better.

### 4.5.4.3 Not implementing with e-portfolio, it was finished

“To me, it is an assignment and I completed it because I had to graduate.”

While Beth, Ella, Emily, and Katy used their e-portfolios for their professional growth in the first year teaching, Vinita did not think she needed to use her e-portfolio again because she viewed it was an assignment that she did it just for the master program. As it was finished and she had graduated, her e-portfolio became a thing that only existed in the past. In the follow-up interview, Vinita stated:
It is finished. Yeah. I do not look at it as a something that developed number one in a few months. I do not know how we even did it….. And it was about my master program, it is not about what I am doing currently.

For Vinita, the e-portfolio was about academic writing related to her past learning. It contained too much information and did not fit with her current teaching content. She said:

I don't look at it as a teaching reference. To me, it is an assignment and I completed it because I had to graduate….What [introducing her e-portfolio to students and parents] is the point? They do not care. It [class website] is about the children, it is not about me…. I would not do it. It is too much information. I don’t see the point…I think they [the program faculty] want us to show our growth and knowledge through the master program. My e-portfolio did that but that meant it is done. I left the graduate school. I am done.

Vinita’s response corresponds to her view of the e-portfolio at the end of the program. Then and later she did not see the point of using it after she graduated.

Table 4.11 summarizes the data from the six follow-up interviews with graduates of the M.Ed. program. It provides insights into how the program graduates transformed their learning of developing e-portfolio into their first year teaching practice. Based on the summarized data, it shows that some of program graduates transformed their learning of developing e-portfolio into their first year teaching practice. However, some of them did not appropriate it into their teaching because of various circumstances such as limited resources, challenging/busy teaching schedule, or personal belief.
<table>
<thead>
<tr>
<th>Graduates</th>
<th>4.5.1 (+)</th>
<th>4.5.2 (+)</th>
<th>4.5.3 (+)</th>
<th>4.5.4 (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beth</td>
<td>– Using skills with digital camera to take pictures of class activities and upload to her class website.</td>
<td>-- Students used PowerPoint to do presentations—book reports, the “creation project.” Students sent e-mail to the President for social study assignment. Searches the internet for teaching/learning resources. Student saved their works on a disc as a collection.</td>
<td>-- Created a class website. Using it to enhance students’ learning, and parents’ involvement.</td>
<td>-- Used her e-portfolio for job interview. Made a link between class website and her e-portfolio—a place her students, colleagues, parents can learn about her. Using e-portfolio as teaching resource.</td>
</tr>
<tr>
<td>Katy</td>
<td>--using the knowledge/skills of e-portfolio to create an informational website.</td>
<td>-- Technology is part of her school life—using computers, filmmaking, overhead, laptop, and uses computer to file student report. Not teaching students to use computers yet because they are kindergartens.</td>
<td>-- Created a class website to share class information and show students their works. Kids take a pride in what they are doing.</td>
<td>-- Gave her e-portfolio URL to students’ parents so they can get to know her educational philosophy better. Using her e-portfolio (units study, lesson plan) as teaching reference.</td>
</tr>
<tr>
<td>Miki</td>
<td>-- Taking digital photos for students’ portraits.</td>
<td>-- Is confident with the school’s technology system. Doing students’ report cards electronically. Uses Kid Pix for students’ learning.</td>
<td>-- Has class website but one school mediator uploads files into the class website. Plans to do it by herself later.</td>
<td>--Using her e-portfolio for interview. Not using/updating her e-portfolio yet. But plans to do it later.</td>
</tr>
<tr>
<td>Ella</td>
<td>-- Tried to use computers/TV in classroom but not very much since limited resources (26 kid with two computers), students did not have many computer skills</td>
<td>-- Did not create a class website yet because first year teaching is very busy, but plan to have one eventually</td>
<td>-- Included her e-portfolio URL in job application. But not using the e-portfolio as teaching reference since the grade was different from her student teaching</td>
<td></td>
</tr>
<tr>
<td>Emily</td>
<td>-- Class has a website but she did not help to maintain it</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinita</td>
<td>--Using PowerPoint presentation but not with meaningful way</td>
<td>-- Not concerned about technology integration very much</td>
<td>-- Has a class website but using a protocol</td>
<td>-- Not using her e-portfolio at all. It was finished</td>
</tr>
</tbody>
</table>

Table 4.11: Summary of six program graduates’ development of learning about e-portfolio
CHAPTER 5

DISCUSSION/SUGGESTIONS/CONCLUSION

This chapter discusses the study’s major findings and provides suggestions to future teacher education programs and researchers. I first review the preservice teachers’ learning experience of e-portfolio in terms of their perceptions of e-portfolios, the social contextual influences, and their learning from developing the e-portfolio. Following these reviews, I discuss my perspective related to the preservice teachers’ learning about developing the e-portfolio. Taking it into the future, I provide suggestions for transforming learning through developing e-portfolios. In conclusion, I give suggestions to teacher education programs for implementing the e-portfolio project and for some future research needed.

5.1 Reviews of the study

This section summarizes the preservice teachers’ learning experiences of developing e-portfolio related to the research questions:

1. What were preservice teachers’ perceptions of developing electronic portfolios?
2. How did sociocultural context influence the preservice teachers’ e-portfolio development?
3. What did the preservice teachers learn from developing their e-portfolios that influenced their technology competency?
4. How did program graduates transform their learning from developing their e-portfolios into their first year of teaching?

The theoretical framework of this study is a sociocultural perspective. From this perspective, the preservice teachers’ learning experiences were understood to be happening within a community, between persons, and on personal three planes (Rogoff, 1995). To answer the first question, the study focused on describing the preservice teachers’ experience of developing e-portfolio as participation within in a community practice, and situated within a particular institutional context (Lave & Wenger, 1991). Answering the second question, this study emphasized the preservice teachers’ learning engagement as a social interaction that described their learning as situated within guided participation within the interpersonal plane (Rogoff, 1995). To answer question three and four, this study explored the preservice teachers’ changes and growth in their knowledge and skills about e-portfolios to examine their personal development of learning through the development of e-portfolios (Rogoff, 1995).

5.1.1 The preservice teachers’ perception of e-portfolio

The first research question aimed to describe how preservice teachers perceived their learning through developing the e-portfolio within the teacher education program and the advantages and disadvantages they identified in developing e-portfolios as an educational practice. Sociocultural theory argues that learning is not a process of acquiring, receiving, and memorizing, but rather it is a process of participating in experience where it is constructed (Dewey, 1938; Rogoff, 1995; Vygotsky, 1978; Wertsch, Rio, & Alvarez, 1995), and what we learn depends upon the quality of experience we have. Dewey (1938) emphasized that knowledge is not out there
somewhere but rather is embedded in the world in which we participate in. When we participate in an action, we experience what we are doing as we construct knowledge. As knowledge is in practice, thereby, the preservice teachers’ knowledge and value of e-portfolio was formed by their experience. At the same time, their experience was situated within the specific nature of the activity involved, as well as its relation to the community in which the practices occurred. Thus, their perception of the e-portfolio process was their experience in a social context; it was a community of practice. Based on participating in a “community of practice” (Wenger, 1998), these preservice teachers perceived the learning about developing the e-portfolio as a process of learning technology skills, doing assignments, providing documentation, thinking reflectively, and sharing their learning.

5.1.1.1 The perception of process in learning technology skills

Related to the process of learning technology skills, the preservice teachers described how they developed varied levels of proficiency with technology skills or knowledge in order to develop their e-portfolios. As most of them started with few skills and knowledge of technology, by creating their e-portfolios, they practiced various educational software as well as developed technology skills such as web page creating, hyperlink making, and digital pictures taking and uploading. As a result, twelve of them perceived their learning about developing e-portfolio as a process of learning technology.

5.1.1.2 The perception of assignments

Related to the perception of the e-portfolio as an assignment, most (87%) of preservice teachers were aware that the e-portfolio was a requirement for the completion of the teacher education program. From this study data, five preservice teachers viewed
the e-portfolio as only an assignment that they finished. These preservice teachers believed that it was too much work for them to develop a significant portfolio within a limited amount of time. They found it was difficult to learn the technology, develop the portfolios, and complete the course work at the same time. As a result, five of the preservice teachers concluded that it was not a meaningful experience. They identified their learning about the e-portfolio as primarily meeting the expectation of the teacher education program. Twelve of the preservice teachers identified varied ways in which this was a valuable experience even though the schedule to produce the portfolio at the end of the program was hurried.

5.1.1.3 The perception of documentation

Related to the e-portfolio as a strategy for documentation, fifty-five percent of the preservice teachers reported that the learning about developing e-portfolios helped them to see their growth and changes in the teacher education program. The e-portfolio contained a lot of work from their courses that the preservice teachers collected during the year. This course work documented the learning process that these preservice teachers went through in the teacher education program. From this documentation, the preservice teachers could understand where they started in the program, what they learned, and what they might be able to do in the future. The e-portfolio thus provided evidence of their changes and growth in teacher education program.

Most of preservice teachers accepted the e-portfolio as a good way to document their growth and change, yet two had concerns about the documentation. They proposed that the e-portfolios was more a showcase portfolio than a way to present their best works.
in the teacher education program. They did not show their change and growth in the four-theme statements and only talked about it in their final reflection.

5.1.1.4 The perception of reflection

Related to reflection, six of interviewed preservice teachers mentioned that the e-portfolio helped them to reflect upon their teaching and learning and become reflective thinkers. As the e-portfolio contained many artifacts such as pictures, writings, practical examples, the preservice teachers could revisit them in order to understand how much they had learned. Five of them re-examined and re-thought about their learning at a deeper level and recognized their growth and changes in the teacher education program. Two of them reflected on how they could do better in their teaching practice in future.

Three presevice teachers did not agree that the e-portfolios helped them to reflect more on their learning. They preferred to use other ways to reflect such as journal writing or writing a daily teaching journal. Two of them believed that reflection is inherently personal. Even without the e-portfolio, they would still reflect on their learning.

5.1.1.5 The perception of sharing learning

Related to sharing their learning through their e-portfolios, the study showed six of these preservice teachers believed that the e-portfolio helped them to be more open-minded by sharing their learning experience with others. Because an e-portfolio is accessible, portable, and easily distributed, these preservice teachers could show their e-portfolios to their parents, friends, and colleagues to share their learning in the teacher education program. Three of them believed the e-portfolio presented their best learning about teaching and represented them as qualified teacher education candidates, and they used the e-portfolios during job interviews. When the preservice teacher started to teach
in the schools, three of the six follow-up participants used the e-portfolio to introduce themselves to others, for example, their students’ parents.

Three of the preservice teachers, however, had different perspectives about sharing. These preservice teachers did not consider the e-portfolio was a suitable way to share information since the e-portfolio contained too much writing related to academic information. Due to finishing their portfolio in a short time, another concern for them was that they did not believe the e-portfolio presented their best works. Therefore, they did not think the idea of sharing the e-portfolio would help others to understand them better. Moreover, based on their personal preference, they wanted to talk with others about their learning rather than show their e-portfolios to others.

5.1.2 Influences of sociocultural context for the preservice teachers’ learning of e-portfolios

This section addresses the research question of what factors facilitated and limited the preservice teachers in developing their e-portfolios, and how the teacher education program engaged the preservice teachers in activities for learning from the e-portfolio process. The study data showed that peers, mentor teachers, and the mutual engagement from the program had an important impact on the preservice teachers’ learning. As suggested by many sociocultural theorists, learning is a social interaction formed and influenced by the environment where it happens (Dewey, 1938; Lave & Wenger, 1991; & Rogoff, 1995). The study confirmed that the preservice teachers’ learning experience of developing e-portfolio was situated with others with whom they interacted and within a particular environment in which they participated.

5.1.2.1 Peer learning
Both Vygotsky’s concept of a “ZPD” (1978), and Rogoff’s ideas about “guided participation” (1995) emphasize that capable peers can assist in the learning process and help learners solve problems. Lave and Wenger concept of “situated learning” (1991) and Wenger’s criteria for a “community of practice” (1998) highlight the idea that group members play different roles in the community. Group members (people) learn from each other’s difference. The study indicated that assistance from more capable peers helped with their skill development. Also, sharing their websites and ideas facilitated their learning, and psychological support played an important role in the preservice teachers’ learning about developing their e-portfolios.

In this study, some of preservice teachers who had better skills in technology helped more inexperienced peers to solve technology problems; some of them had a clear understanding about assignments that they could explain to others; and some of them felt comfortable with expectations for the e-portfolio. As they worked as a group, either in the lab or in the class, they talked, asked, and listened to each other’s questions and ideas. The data provide many examples of ways these students’ learning, throughout the e-portfolio development process, was guided and supported by peers.

5.1.2.2 Guided participation from mentor teachers

The mentor teachers’ help was considered as another factor that affected the preservice teachers’ learning of e-portfolio. The data for this study indicated that only five of the 17 preservice teachers received help from their mentor teachers while they were documenting their student teaching. The mentor teachers helped by taking pictures while the preservice teachers were teaching a lesson; sometimes they collected various artifacts such as lesson plans, or student work documentation. In addition, they shared an
interest and valued the e-portfolio process. As the result, these mentor teachers acted as guided participators in this shared interest (Rogoff, 1990) with these preservice teachers.

The study data, however, also showed that twelve of preservice teachers did not receive much help from their mentor teachers. These mentor teachers focused most of their attention on the preservice teachers’ student teaching and showed little concern for the e-portfolios. Without building a joint enterprise between the schools and the university, the mentor teachers could not participate in the e-portfolio as a joint activity and did not view the student teaching documentation as a shared repertoire (Wenger, 1998). As the result, these presevice teachers had less rich documentation of their student teaching.

5.1.2.3 The mutual engagement from the program

As the program faculty promised the e-portfolio project developed as a community of practice in which the preservice teachers’ learning with e-portfolio involved mutual engagement and arrangement of activities, this mutual engagement from the teacher education program seemed to have had a great impact on the preservice teachers’ learning during the process of developing their e-portfolios. This study showed that the instructors’ guided participation, incorporations of course assignments, directions and clear expectations, and integrations of curriculum were planned to increase the preservice teachers’ participation in developing their e-portfolios.

The data indicated that the instructors were willing to help the presevice teachers in developing their e-portfolios. They provided guidance with either technical skills or e-portfolio content. Four of instructors incorporated the e-portfolio into their course syllabus. The preservice teachers argued that earlier concrete directions would have
resulted in less confusion and frustration. However, the data also showed that the program faculty did provide communication and demonstration at critical points in the process. The pre-service teachers also suggested that integrating the e-portfolio development into each course would have helped them develop their e-portfolio throughout the year rather than leaving so much work for the final summer quarter. Some instructors, but not all, integrated the e-portfolio assessments into their course syllabi. As Wenger (1998) emphasizes, a shared repertoire is one of the elements within a community of practice. When people are engaged in community activities, they have to know the routines and ways of doing things in order to accomplish the joint goal. In this study, the program instructors had different ways of integrating the e-portfolio into their courses. From the pre-service teachers’ perspective, the mutual engagement within the program was not always consistent. As the result, the pre-service teachers and the faculty did not have common understandings to respond to the requirements and expectation of learning e-portfolio. Their understandings and expectations about the e-portfolio varied. These different understandings made the mutual engagement ambiguous. On the one hand, the ambiguity made coordination and communication difficult. On the other hand, it kept communication and negotiation among all the instructors and the pre-service teachers on-going throughout the program. As Rogoff (1995) emphasizes, communication and coordination are necessary to guided participation. In the process of developing e-portfolio, the study data showed that the pre-service teachers were confused about the routines and ways of doing e-portfolio even as the program endeavored to provide coordination and communication. However, as the e-portfolio project only had a two-year history in this teacher education program, it seems that the reification of
developing the e-portfolio project in the teacher education program had not yet been built. This lack of reification affected the participation, communication, negotiation, and coordination between faculty and the preservice teachers.

5.1.3 The preservice teachers’ development of learning e-portfolios

This section summarizes the research question related to the skills and knowledge of using technology that the preservice teachers learned, how preservice teachers planned to utilize their e-portfolio, and how some of the preservice teachers transformed their learning from the e-portfolio into their first year of teaching.

The interview study results demonstrated that these sixteen preservice teachers increased their technology competency during the process of completing the requirements for their e-portfolios. The preservice teachers not only learned technology skills such as creating web pages, taking digital photos, scanning images, but they also knew how to use technology to enhance teaching and learning such as using PowerPoint for lesson presentation, creating class website for sharing class information, and using digital cameras for classroom documentation. Most of the preservice teachers reported that they were confident with using technology in general for teaching and learning.

Sociocultural theory emphasizes the idea that learning leads development. From today’s learning, people are able to do tomorrow’s related activities (Dewey 1938, Vygotsky, Rogoff, 1995). Many of these preservice teachers, as the study showed, had little knowledge or skills of technology in the beginning of program. After finishing the e-portfolio, the preservice teachers’ skills and knowledge of technology increased. By the end of the program, these preservice teachers indicated capacity in using and integrating technology for teaching and learning.
The follow-up interview data with 6 program graduates in their first year of teaching, three of them transferred their learning from the e-portfolio into subsequent activities into their teaching. Two of first year teachers used the e-portfolio to introduce themselves to their students, parents, and colleagues. Both of them utilized the e-portfolio as a teaching reference in which they went back to look for lesson plans or units and to get teaching ideas.

Three of the first year teachers integrated technology into their teaching to create enhance teaching and learning such as creating class website, documenting students learning, or teaching students to learn technology. They used technology as a cultural tool in the classroom for enhancing students’ learning. For these program graduates, their learning was not fixed with accomplishing the e-portfolio but rather became a force to lead them into another level of learning (Dewey, 1938; Lave & Wenger, 1991; & Rogoff, 1995). Two of the program graduates did not implement what they had learned from developing e-portfolio into their teaching, either due to the perceptions of their learning experience with the e-portfolio in the program, or the expectation and procedures within their school district, or because of the dynamics of their school cultural. For these program graduates, their learning of developing e-portfolio in the teacher education program did not appear in subsequent activities within a new social context. In all fairness, however, the data were collected three months into these graduates first year of teaching. It is possible that the integration of technology might increase as they gained more security and were less busy than they were at the beginning. All three of the teachers who had not yet integrated technology indicated that they were planning to do more in the future.
5.2 My understanding of the study

From this study, I understand that the preservice teachers’ learning experience of developing the e-portfolio had two aspects: the product of the e-portfolio and process of developing e-portfolio. Both parts can be understood within two different learning periods during the program in the teacher education programs and after graduation when they were hired to teach. However, I do not intent to dichotomize their learning from developing the e-portfolio. These two parts are connected to each other. The figure 5.1 illustrates a conceptualization of the preservice teachers’ learning while developing their e-portfolio in teacher education programs.

Figure 5.1: Researcher perspective of the preservice teachers’ learning
5.2.1 The product of e-portfolio during the teacher education program

The product of an e-portfolio itself was finished by preservice teachers while they were in the teacher education program. The e-portfolio as a documentation was intended to show their change and growth throughout the program. Through this documentation, preservice teachers looked back to reflect upon their learning and link it to the future. The preservice teachers reflected on the e-portfolio documentation to understand what they have learned and were able to do, and how they could do more or better in the future. Ultimately the e-portfolio was an artifact for reflection.

Moreover, as the e-portfolio was portable and easily distributed, so preservice teachers could share their learning with others. For the teacher education program, instead of traditional ways of assessments such as testing or writing a thesis, this teacher education program evaluated their graduates by viewing the e-portfolios as an assessment covering the five-quarters of the students’ learning.

5.2.2 The product of e-portfolio after graduation

If the value of an e-portfolio ended when the preservice teachers graduated, it was just an assignment they finished and they would not utilize it ever again. Then the e-portfolio was not a valuable tool for learning. However, as the 6 program graduates interviewed for this study entered Per-K-3 schools to teach, the product of the e-portfolio became a reference for teaching, reflection, and sharing. Two of them used the e-portfolio to introduce themselves to others such as colleague, their students, and parents. From viewing it, their students, colleagues, and parents would know where they were coming from or what they believed. Or they used it to reflect on their professional growth and changes after they graduated. After teaching for three months, they could reflect back on
the e-portfolio to check if their educational philosophy changed or not. These two teachers used it as a reference to examine their professional progress.

The content of e-portfolio such as lesson plans and units studies was a good teaching resource for two of them. For these first year teachers who did not have much teaching experience, they could go back to look at the e-portfolio for examples and ideas.

5.2.3 The process of developing e-portfolio during the teacher education program

In the process of developing the e-portfolio, the preservice teachers were required to practice various technology skills. For example, they had to know how to make hyperlink and upload files and images. Their practice with various technology skills were integrated into meaningful activities such as using digital cameras to document student teaching and using scanners for collecting students’ piece of writing or art works. Thus, they employed technology to document significant aspects of their teacher education program. In the process of documentation, they collected and selected significant artifacts, reflected on the meaning of those artifacts and why they were important to them, and ways those artifacts had influenced their learning. Within this reflective process, they made connections between their written statements and examples and their theory and practice. The learning within the process of developing the e-portfolio was a social practice taking place within a learning community. The data indicated that sharing and confirming their ideas with others, pushed the preservice teachers’ beyond their own personal narrow views or biases. By sharing their ideas with others, they came to see possibilities and further clarify their thoughts. They consulted with peers and instructors. Through communicating with others in the reflective thinking process, preservice teachers affirmed the value of their experience and also came to see some things in a new light.
In the process of developing their e-portfolios, the preservice teachers had opportunities to practice technology skills in meaningful ways. By doing so, they acquired better skills and knowledge of using technology. The data indicated that they came to understand that documentation could make their learning visible to themselves and others. In addition, they recognized that reflection could bring their past, present, and future experience together (Dewey, 1933). It made a connection between theory and practice (Cochran-Smith & Lytle, 2001). Moreover, through the process of sharing, they learned that collective reflection can offer alternative meanings to broaden their learning (Cochran-Smith & Lytle, 2001; Lieberman & Miller, 1999; Rodgers, 2002; Zeichner & Liston, 1996). In sum, the process of practicing technology, the process of documentation, the process of reflection, and the process of sharing supported their learning through developing the e-portfolio in a meaningful way.

5.2.4 The process of e-portfolio after graduation

The assumption was that if preservice teachers developed meaningful learning through the process of developing their e-portfolio, they would be better prepared to teach in the classroom. When the preservice teachers graduated from the teacher education program, they were hired to teach in Pre-K-3 schools. The data from the six follow-up interviews indicated that three of them implemented the skills and knowledge of technology they learned from developing the e-portfolio into their teaching. They either created a class website to enhance teaching and learning or integrated technology into their teaching. Three used technology skills to practice with documenting their classrooms. Students’ work, pictures of class activities, and weekly teaching lessons were uploaded into the class website. As the documentation made both teaching and learning
visible, their students had a chance to know what they had learned. The teachers also had an opportunity to continue to reflect upon their own learning by developing a deeper understanding of the influence of their teaching on students’ learning. In addition, as this documentation was placed on a class website, two teachers were able to share what happened in their classrooms with the parents. As a result, the parents got to know and could be more involved in what their children learned at school.

From the process of developing an e-portfolio in the teacher education program to the process of implementing their learning into their classroom teaching, the learning of e-portfolio was transferred into their classroom. When this happened, the preservice teachers’ learning experience of developing e-portfolios became a participatory appropriation (Rogoff, 1995). They transferred their learning from the e-portfolio into their own practice.

5.3 My learning from the study

In this study the preservice teachers’ learning from developing their e-portfolios was situated in an environment in which they needed to participate in specific activities, and interact with peers, mentor teachers, and instructors in order to accomplish the goal. The preservice teachers grew in their technology proficiency; they used the e-portfolios as a cultural tool to mediate their learning about technology, documentation, reflection. They created their e-portfolios, they documented their growth and changes, and they shared their learning; most important, they reflected on what they had learned and what that would mean for their future teaching. However, cultural tools are culturally, historically, and institutionally situated (Wertsch, 1995). As these preservice teachers graduated and were hired to teach, they used what they learned from developing their e-portfolio to
create classroom websites as cultural tools to document and reflect on their teaching. That is, the form of the e-portfolio was transformed into another means of using technology. Their learning from the e-portfolio was transformed to enhance teaching and learning in their first year of teaching.

Based on my learning from this study, the transformation of preservice teachers’ learning from the e-portfolio process into their teaching involved two social contexts, one was the teacher education program and the other will be the schools in which they teach (see the red lines in figure 5.1). The possibility for transformation will more likely occur when these two social contexts are similar in ways that both support using technology as a cultural tool. The possibility that this transformation will occur can also be hindered by these contexts.

From my understanding of the follow-up data with first year teachers, the preservice teachers’ learning transformation of developing e-portfolio from one social context to another involved appropriating their learning to subsequent similar and dissimilar activities. The new contexts influenced how and if the preservice teachers transformed their learning of developing e-portfolio into their teaching. If the school culture has the same values and understandings of the value of e-portfolio, these first year teachers were more likely to appropriate their learning of developing e-portfolio into subsequent teaching activities.

Based on my learning from this study, there are several things that may facilitate preservice teachers learning from their teacher education program into their subsequent teaching. School district should provide a rich technology environment that requires and supports classroom teachers in creating class websites and integrating technology into
their teaching practice. If school principals and colleagues value their e-portfolio work, the first year of teachers may be more likely to transform their learning of developing the e-portfolio into their first year teaching. If the school districts do not have clear expectation for technology integration, if the schools have limited technology resources, and teachers do not need to maintain class websites, they are less likely to transform their technology learning from the e-portfolio into their teaching.

5.4 Suggestions to teacher education programs

From this study I learned that the influences of the sociocultural context within the teacher education program straightforwardly influenced the preservice teachers’ learning from the development of their e-portfolios. That is, individual (preservice teachers), groups (the teacher education program/schools), and communities (society) interrelated and constituted each other. Based on this point of view, I make three suggestions for teacher education programs. These suggestions are intended to provide a connection among community practice, the interpersonal, and the personal levels, providing interaction within three social contexts (see figure 5.2).
Figure 5.2: My concept of learning of developing e-portfolios

The first suggestion is to build coherence within the faculty in order to developing a joint enterprise (goal) related to the e-portfolio project. The teacher education program can have a significant effect on the preservice teachers’ learning if there is a shared repertoire for developing the e-portfolio. Without this, the program faculty and the preservice teachers could not build a common understanding of developing e-portfolios. In this study, this situation produced some levels of confusion and frustration in the process of developing the e-portfolio. Thus, both students and faculty experienced difficulties. It takes negotiation and communication to build coherence and agreement,
i.e., mutual engagement, to guide the preservice teachers’ participation in developing e-portfolios. That is, before engaging preservice teachers in learning activities to develop their e-portfolio, faculty have to build a common interest and commitment to integrating the e-portfolio into their courses. That is, teacher educators (faculty) must jointly value the e-portfolio as a cultural tool that can mediate the preservice teachers’ learning. There needs to communicate among the faculty about their course schedule arrangements, curriculum support, and course assignments related to the e-portfolio. A framework to explain how e-portfolios can contribute to each other course’s objectives and help for instructors to achieve these educational goals should be provided. Examples for each course assignments and activities to reveal how they could be situated in the e-portfolio should be demonstrated. As a result, the presevice teachers could learn to develop the e-portfolios in a meaningful way within a coherent teacher education programs.

The second suggestion is to build a joint goal for establishing a community of practice between the preservice teachers and faulty in teacher education. In order to avoid a gap between the preservice teachers’ perception of developing e-portfolio and the faculty’s expectations, I suggest that teacher educators have to guide preservice teachers to perceive the e-portfolio as a cultural tool to mediate their learning of technology, reflection, and documentation. Providing demonstrations and examples of e-portfolios project goals for concrete expectations in the beginning and throughout the program would help preservice teachers understand what, how, and why the e-portfolio should be done. As a result, preservice teachers would learn to document, reflect, and learning collaboratively through developing the e-portfolio as a joint goal and activity.
The third suggestion to teacher education programs is to bring the schools into participation with the e-portfolio project. Without the support and guidance from their mentor teachers, preservice teachers in this study had difficulty seeing the connection between the schools and the teacher education program in the development of the e-portfolio. Further, some of the graduates from this program could not appropriate their learning from the program in their first year teaching because of the schools’ limited resource and support and/or the challenges that come in the first year of teaching. Therefore, teacher education programs should not only focus on structuring mutual engagement within the teacher education program, but they also need to consider what happens in schools. Faculty in teacher education programs should recognize the potential ways for integrating the e-portfolio into the field experiences. Joining the schools’ perspective could connect preservice teachers’ learning of developing e-portfolios with practical experiences. Teacher education programs could work collaboratively with the teachers, or at the least hold workshops that invite mentors and school principals to learn about the e-portfolio project. Teacher education programs could demonstrate how e-portfolio learning could contribute to teaching and learning and how schools could support and guide preservice teachers’ learning of e-portfolio while student teaching. This closer connection of work at the university and work in the schools might support the preservice teachers’ to better integrate their learning of e-portfolio into their student teaching. In turn, this might support their future integration of technology in the schools as they begin to teach because they would have experience with appropriating their learning of e-portfolio into classroom activities.

5.5 Suggestions for future research
In this study, six follow-up interviews with graduates explored how the e-portfolio learning experience was integrated or not integrated into their first year teaching. It provided a beginning examination of how graduates might transform their learning in their future teaching. The study showed that some of the graduates did appropriate their learning of e-portfolio to various subsequent activities in their teaching. However, this study only did follow-up interviews with six graduates after they had been teaching three month after graduation. Future studies are needed to follow more graduates for longer periods of time into their teaching. In addition, follow-up classroom observations of their practice of integrating technology in the classroom is needed.

The results of this study indicated that the culture and environment of the Pre-K-3 schools had an impact on the first year teachers’ application of their learning of the e-portfolio into their teaching. However, this study did not deeply examine the school social context. There is a need for more research on how the school’s social and political contexts influence first year teachers in implementing their knowledge and skills from the e-portfolio process into their teaching. Such research should examine the school context related to the use of technology, the expectations about technology integration within the school district, and principal and the technology environment/resources/support in the classroom and school.

This study also showed that preservice teachers’ learning about developing e-portfolio contributed to their ability to create classroom web sites as they began to teach. For future study, I would investigate the use of class websites as a way of documenting how teachers can use to other forms of technology to enhance teaching and learning. This research could examine how classroom teachers create their class websites, how they
utilize these websites for teaching and learning, and how they use class website to document their own professional growth.

5.6 The conclusion for future hope

The use of e-portfolio in teacher education programs is providing one way of preparing pre-service teachers’ technology competency. The e-portfolio, as a cultural tool, can mediate pre-service teachers’ understandings of teaching and learning by integrating several different purposes (learning technology, reflection, documentation, sharing learning), involving different people (pre-service teachers, peers, faculty, and mentor teachers), and happening in different places (teacher education programs and schools). In my opinion, the learning from using an e-portfolio as a cultural tool to document learning can connect these differences. These differences, however, create complexity and tensions in the learning process. It is necessary that we, as teachers, recognize, respect, and acknowledge that differences exist in the nature of learning which we can use to engage students in productive learning activities. If we could negotiate and communicate across these social context differences, meaningful learning from an e-portfolio developmental process can happen.

From my understanding, the learning from e-portfolios works best when it is an on-going process. Yet, making this work well it is not an easy task for teacher educators. Teacher educators need to know how to bring the different groups to shared understandings of e-portfolios and how they can create a shared language about the e-portfolio throughout the teacher education. Participants in such a sociocultural activity of learning e-portfolios must have a common understanding in relation to expectations and requirements. Ultimately, my goal is that pre-service teacher, through learning from the
development of an e-portfolio in their teacher education programs, would be able to transform their learning into their teaching in the future.
REFERENCE


APPENDIX A

INFORMED CONSENT FORM

Protocol#2004E0290

CONSENT FOR PARTICIPATION IN RESEARCH

I consent to participating in research entitled: How Pre-service Teachers Perceive Their Professional Competency and Growth through Developing Electronic Portfolio in a Teacher Education Certification Program Perception.

Shwu-Meei Chen, Principal Investigator, has explained the purpose of the study, the procedures to be followed, and the expected duration of my participation. Possible benefits of the study have been described, as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw consent at any time and to discontinue participation in the study without prejudice to me.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily.

Date: ___________________________ Signed: _________________________

(Participant)
APPENDIX B

LETTERS FOR PARTICIPANTS

July 12, 2004
Dear Participant:

This letter is about to inform you the nature of my study. The purpose of my study is to investigate preservice teachers’ perception and learning experience of developing electronic portfolios. The outcome of this study will contribute to teacher education programs as to how electronic portfolios enhance preservice teachers’ technology competency and professional growth.

As you developed your electronic portfolio throughout the 2003-2004 school year, you have learned so much in the teacher education program. I plan to do survey, individual interviews, and look at your electronic portfolios. Your experience in developing electronic portfolio will help me explore in depth how electronic portfolio can facilitate preservice teachers’ learning, and how preservice teachers use technology in their future teaching.

I wish to thank you in advance for your input to my study. Your participation is voluntary. Your time and effort are greatly appreciated. Your response to this study is solely used for my dissertation and will be kept confidential. Please feel free to communicate with me about any concerns or questions you have during the process of this study. If you wish to learn about the research outcomes, you are welcome to contact me after the completion of this study.

Sincerely,

Shwu-Meei Chen
Ph.D. Candidate
Project Researcher
Oct 18, 2004

Dear Dr.______________:

This letter is about to inform you the nature of my study. The purpose of my study is to investigate preservice teachers’ perception and learning experience of developing electronic portfolios. The outcome of this study will contribute to teacher education programs as to how electronic portfolios enhance preservice teachers’ technology competency and professional growth.

As you have worked with the 2003-04 M.Ed. students to help them develop their e-portfolios, your teaching and course arrangements are crucial to M.Ed. students’ learning of e-portfolios. Your participation in this study will enrich my understanding of their learning context. I plan to interview you to learn about your perspective of students’ learning. I will like to learn about your theory of students’ learning related to e-portfolios, how your course design relates to e-portfolio, and your suggestions for future e-portfolio projects.

I wish to thank you in advance for your input to my study. Your time and effort are greatly appreciated. Your response to this study is solely used for my dissertation and will be kept confidential. Please feel free to contact me about concerns or questions regarding this study. If you wish to know about the research outcomes, you are welcome to contact me after the completion of this study.

Sincerely,

Shwu-meei Chen
Ph.D. Candidate
Project Researcher
Dear X:

How is your teaching going? I hope you have a wonderful school year with your students. I believe you must have learned a lot throughout these three months teaching experience. I wonder can I have the privilege to interview you again to learn from your teaching experience with technology.

As I finished the first interview with you in the July, I am transcribing the interview data and trying to analyze data now. I believe the follow-up interview with you will help me to understand how the learning experience of developing e-portfolio plays the role in your teaching. I like to know how you use (update, or maintain) your e-portfolio, how the e-portfolio learning experience influence (effect) your teaching. I understand you are very busy with teaching. However, your voice is very important for the study. However, your voice is very important for the study. I ask for if you can give me 30 minutes to talk with you. Please check your schedule and let me know when and where you like to meet. Your any response will be greatly appreciated.

Truly thank you again for all the input to my study. Without your help, my study will never be done. Best wish to your teaching and having a nice weekend!

Yours
Shwu-Meei
(Email message 11/20/04)
APPENDIX C

P&L 791 ASSIGNMENTS CRITERIA

Assignments > Initial Portfolio Project
This assignment will be the first step in the creation of your electronic portfolio. The assignment will include your home page which is the first page that visitors to your web site will see along with the other parts of your portfolio which you will complete during your program over the next 5 quarters. Your home page will include basic biographical information such as your name, e-mail address, etc and appropriate graphics. This assignment should also include a separate page to link to all your EDPL 791 assignments. On your EDPL 791 assignments page you should list all the assignments in the course including your teacher profile, web/software evaluations, presentation software project, spreadsheet project, and technology-based lesson plan. Please make certain that you take into consideration the following criteria.

Each page should include 4 links: Educational Philosophy, Student Teaching, MEd coursework, and Resume.
The "Educational Philosophy" section should include 4 links: Learning and Development, Families and Communities, Equity and Diversity, and Constructing Curriculum.
The "Student Teaching" section should include 2 sections: Lesson Plans and Journals.

HERE is an example of all the components that your portfolio should contain.
YOU DO *NOT* HAVE TO FILL IN ANY OF THE PAGES EXCEPT FOR THE 791 PROJECTS FOR THIS CLASS.

Your site should meet the following criteria:

Structural:

- At least 1 e-mail and 1 external link (i.e., a link to an external web site)
- Create a separate page that lists all your 791 projects (link to that page from your Summer, 2004 page in the "M.Ed. Coursework" section.)
- Two or more graphics. Make certain that all graphics have .alt tags. Also make certain that you have rights to use the images that you select.

Functional:

- Make sure all your links and images work
- Make certain that you have no dead-end pages
- Provide a descriptive title for each page
- Clearly identify external links
- Provide consistent navigation on each page. All navigation must be in the same place on each page and appear on the first screen of each page (i.e. without having to scroll to get to the navigation.)
- (optional) Include the modification date on each page

**Conceptual:**
- Logical relationship between text and images
- Design unity between pages
- Each page should have the same basic layout
- Adequate contrast between text and background

**Evaluation Rubric**

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web page meets all structural, functional, and conceptual requirements.</td>
<td>Web page meets some of the structural, functional, and conceptual requirements. Some of the graphics may not complement the visual or conceptual theme of your homepage. There is some design unity between the pages. There are some spelling or grammatical mistakes.</td>
<td>Web page meets few or none of the structural, functional, and conceptual requirements. The text is difficult to read on your pages. There is insufficient contrast between the text and background. The location of the navigation is not consistent. There is no design unity between the pages. There are many spelling or grammatical mistakes.</td>
</tr>
<tr>
<td>All your links work correctly, your page is visually consistent and appealing. There is design unity between your pages. The navigation appears on the first screen of a page. There is sufficient contrast between the text and background. There are no spelling or grammatical errors.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When you are finished, please email your TA to tell them that you are ready for your project to be evaluated. In your email include the URL of your site.

**Assignments > Teacher Profile**
**Due:** By midnight on the day of your first lab in week three.
**Teacher Profile:** (10 % of grade) – There are many factors that impact how we integrate technology into our classroom including institutional constraints and resources, student characteristics, personal philosophies about teaching, and technology skills. In this project you will develop a profile of the educational setting that you will address through
your course projects. Utilize the information provided in the community, district, school, classroom, teacher, and curriculum profiles as well as your own goals and background to create a context for your projects. You may wish to include information about your approach to teaching, technology and assessment. You are encouraged to refine this profile as you progress through the course. (1000 words)

Details
Your teacher profile provides you with a context to think about the following four assignments (Web/software Evaluation, PowerPoint Project, Excel Project, Media/Technology-based Lesson Plan). It should be written in the first person. Your profile should include 4 sections (1) District / Community, 2) School, 3) Classroom, and 4) Teaching philosophy.

Example:
You may wish to start each section with something like the following text: 1) District / Community- I will create my projects for a school in an urban/suburban/rural school district. 2) School - The school for which I am designing my projects is a(n) urban/suburban/rural school. 3) Classroom - The class for which I am developing my projects is a 1st grade class. 4) Teaching Philosophy - In my approach to teaching with technology I believe that...

Utilize the information provided in the community, district, school, classroom, teacher, and curriculum profiles, as well as your own goals and background to create a context for your assignments. Use the information/questions/issues/considerations provided in the "Teacher-Profiles" to help you to create your Teacher profile. Incorporate as much of your own experience, background and interests as possible to create your profile.

Your profile should include these considerations in the following sections:

- **District / Community** - Include information like the kind of district (urban, suburban, rural), the district's socio-economic makeup and technology resources. See the District considerations for more characteristics to consider. In this section you will also address the community makeup and resources available to you. See the Community considerations for more characteristics to consider about the community.

- **School** - In this section you will address the characteristics of the school including size, average class size, administration, scheduling, technology resources, infrastructure, etc. See the School considerations for more characteristics to consider.

- **Class** - In this section you will address the characteristics of the class for which you are creating your projects including the class size, racial and ethnic makeup, presence of special needs students, curriculum, technology resources, etc. See the Class considerations for more characteristics to consider.

- **Teacher** - In this section you will include the description of your attitudes, knowledge and philosophy in relation to technology, teaching and assessment. See the Teacher considerations for more characteristics to consider.
Include the Teacher Profile in your web site. When you are finished, please email your TA to tell them that you are ready for your project to be evaluated. In your email include the URL of your site.

**Assignments > Web / Software Evaluations**

**Due:** By midnight on the day of your second lab in week three.

**Web / Software Evaluations:** (10 % of grade) Identify and thoroughly explore 1-3 (one 1200 word evaluation or two 600 word evaluations or three 400 word evaluations) educational web sites and/or computer based educational programs to help you meet an Ohio Content Standard or Benchmark. You will complete an annotated list of web sites/educational programs, which will include a summary of the site/program, as well as, a critique of its content, structure, and educational value. You will post your evaluation to your portfolio and link to it from your 791 projects page.

When your project is complete email the url of your portfolio to your TA

**If you decide to evaluate educational web sites, look for the following criteria:**

**INCLUDE THE FOLLOWING INFORMATION:**

- What is the name of the site?
- What is the URL (i.e. http://www.nasa.gov/) of the site?
- Briefly describe the site.
- What seems to be the intended audience (stated or not) of the site?
- What can you tell about the author(s) of the site?
  - What are the author's reputation and qualifications in the subject covered?
  - Does he or she list his or her occupation, years of experience, position, or education?
  - Is the site sponsored or co-sponsored by an individual or group that has created other Web sites?
  - Is contact information for the author or producer included in the site?
  - What institution (company, government, university, etc.) or content provider supports the site?
  - If it is a commercial content provider, does the author appear to have any affiliation with a larger institution?
  - If it is an institution, is it a national institution?
  - Does the institution appear to filter the information appearing under its name?
  - Does the author's affiliation with this particular institution appear to bias the information?
TECHNICAL CONSIDERATIONS

- How long did it take to go through the whole site? What are the implications of its size in relation to how you would use the site for a class.
- Does the site (or parts of the site) take long to download?
- Does the site recommend any special software or hardware requirements (browsers version, plugin, etc.)
- Is appropriate interactivity available? What is the level of interactivity?
- How well is the site maintained?
- Did you have any technical problems accessing the site?

SITE CONTENT

- Is the site's information accurate and appropriate?
- Is the information presented in an objective, balanced manner?
- Is the material on the site covered adequately?
- How current is the information?
- Is the information well-written?
  - Does the text follow basic rules of grammar, spelling and literary composition?
- Is the reading level appropriate for your intended students?
- Is the difficulty level consistent and appropriate for your intended students?
- Does the site tell you when it was last updated?
- Does the site follow good graphic design principles?
  - Do the graphics and art serve a function or are they decorative?
  - Do the icons clearly represent what is intended?
  - Are the visual metaphors appropriate for the audience (i.e. your students)?
  - Is there an element of creativity?
- Is attention paid to the needs of the disabled -- e.g., large print and graphics options; audio; alternative text for graphics?
- In what ways is the site biased (racial, sexual, geographical, political, ethnic, class, etc.)?
• How does the site compare with other sites on the same subject?
• Is it easy to move around and locate information on the site?
• Are their external links provided on the site? If so,
  o What is the quality of the links provided?
  o Are there any bad links in the site?
  o What are the link selection criteria, if any?
  o Are the links relevant and appropriate for the site? Are the links comprehensive or do they just provide a sampler?
• Can visitors get the information they need within a reasonable number of links (preferably 3 or fewer clicks)?
• Is there a way to search the site for specific information (or a need for one)?
• If present, do video or audio add educational value to the site?

OVERALL RATING OF THE SITE:
• What is your overall assessment of the educational value of this site for your students?
• Is the site an appropriate use of the medium?
• Does the site contribute something unique on the subject?

If you decide to evaluate educational software, use the following criteria:
INCLUDE THE FOLLOWING INFORMATION:
• Program Title:
• Platform: (Mac/Windows):
• Minimum Hardware/Software Requirements:
• Prerequisite Skills (e.g. reading level, math level, etc.):
• Appropriate Grade Level(s) (Stated vs Actual):
• Type of Program (Drill & Practice, Tutorial, Classroom Management, etc.)
• Instructional Purpose (Remediation, Standard Instruction, Enrichment)
• Group Size: (Individual, Small Group, Class)
• What are the program’s objectives?
• Briefly describe the program.
EDUCATIONAL CONTENT:
- Is the program information accurate and appropriate?
- Is the reading level appropriate for your intended students?
- Is the content age appropriate?
- Does the program show realistic concepts?
- Is the difficulty level consistent and appropriate for your intended students?
- In what ways is the program biased (racial, sexual, political, geographical, ethnic, class, etc.)?
- Is the program free of violent characters?
- Is it an appropriate use of the computer?

PRESENTATION:
- Is the program free of technical problems?
- Are the instructions clear? Are the instructions verbal, written, graphical?
- Is there a help function available? If there is, how thorough is it? Is the curriculum material logically presented and organized?
- Do graphics, sound and color enhance the presentation?
- Is their mixed gender and role equity?
- Are their culturally diverse characters?
- How are characters abled?
- Are their diverse family styles represented?

INTERACTION:
- Are the objectives defined to the student?
- What is the level of Interaction?
- Can the student set the pace?
- Are students actors or reactors?
- Does the program allow for trial and error?
- Can the student end at any point they wish?
- Is feedback effective and appropriate?
• Can students control the pace and sequence of the program?
• How does the program respond to wrong input?
• How much typing is required to offer answers to questions?
• Can students save their work?

TEACHER USE:
• Is record keeping possible?
• Does teacher have to monitor student use?
• Can the teacher modify the program?
• Is the documentation clear?
• Are student materials provided?
• Are the program objectives appropriate for the teacher’s curriculum?
• Does it tell the teacher how to integrate the program in a larger curriculum?

LEARNING STRATEGY:
• What instructional strategy does the web site use? (e.g., discover, drill and practice, tutorial)
• Is the instructional strategy sound? Appropriate? Creative?
• Is learning sequence clear?
• What is the range of abilities supported by the program?

TECHNICAL CHARACTERISTICS:
• Does the program install easily?
• Does the program operate consistently?
• Does the program allow students to print?
• Does the program run at an expectable speed?

OVERALL RATING OF THE PROGRAM:
• What is your overall assessment of the educational value of the program?

Assignments > PowerPoint Project
POWERPOINT PROJECT

For this assignment, you will create an educational PowerPoint presentation with at least (10) screens. You will incorporate this assignment into your website. Include a one-page (250 word) description of how the presentation would be used to teach in the context
described in your teacher profile. In this description also state which Ohio Content Standard this PowerPoint presentation would help you to meet.

Your presentation should meet the following specific criteria:

**Structural:**
- At least ten (10) screens
- Include at least 5 graphics
- Change the background of one of your screens
- Use at least one sound
- Use at least one transition between slides
- Include at least one hyperlink within your presentation
- Animate at least one block of text
- Animate at least one graphic
- On the web page with your 250 word description create two links - one called "View Presentation" and one called "Download Presentation." You will create a link to the web compatible version of your web site for "View Presentation" and you will create a link to the actual presentation for "Download Presentation." In order for you to do this you will need to save your presentation to your web site in two forms, as a web page and as a presentation.

**Functional:**
- All links, animations, and graphics should work correctly
- Make certain that there is navigation on the page with your description

**Conceptual:**
- The content is appropriate for the learning context and the students
- Graphics and sound that complement the lesson
- Background and text complement each other
- Transitions and animations are selected with purpose
- The layout of each slide is well-balanced

If applicable, the sources of your content should be cited at the end of your presentation

Assignments > Spreadsheet Project
For this assignment you will develop a spreadsheet activity (including an accompanying spreadsheet) that you could use with students or create a spreadsheet that could assist you in your classroom practice. You will incorporate this assignment into your website. (All design requirements from your homepage assignment (e.g. consistent navigation and layout) apply to this assignment). Include a one page (250 words) description of how you will integrate your spreadsheet into a lesson or how it will support your teaching. If applicable, describe how students will acquire the numbers that they will input into the spreadsheet. If you create a spreadsheet that you could use to help you teach a lesson then address the Ohio Content Standard(s) that this spreadsheet would help you to meet.

Create a link on your Spreadsheet project description page called, "Download Spreadsheet." Save/upload your excel file to your web account and create a hyperlink to that file. The filename will end with .xls.

Your project should meet the following specific criteria:

**Structural:**

Include:

-At least 10 rows & 10 columns
-At least 2 functions
-At least 2 formulas
-Comments to identify your formulas and functions
-At least 2 meaningful charts
-Clearly marked axis (i.e. x,y axis) in your charts, if applicable
-Clearly marked headings and rows
-A title at the top of the worksheet
-Clearly labeled worksheet(s) and charts
-Use appropriate labels for the numbers (e.g. %,$, etc.)
-The use of color to organize your spreadsheet?
-If applicable, lock the appropriate panes of your spreadsheet to make scrolling easier.

**Functional:**

-All formulas, functions, charts should work correctly

**Conceptual:**

-Is this an appropriate use of a spreadsheet?
-Is this a creative use of a spreadsheet?
When you are finished, please email your TA to tell her/him that you are ready for your project to be evaluated. In your email include the URL of your site. (i.e. http://www.christa.coe.ohio-state.edu/voithofer.2/).

**Assignments > Technology/Media-based Lesson Plan**
To complete this assignment you will want to first look at the links for Web-based lessons, rubrics, and how to write a lesson plan.
For this assignment you will create a technology/media-based lesson for the class described in your teacher profile and that is aligned with one more Ohio Content Standard. The lesson should take 3-5 days for you to complete with a class. Integrate the lesson into your electronic portfolio. The lesson should complement the design that you have established in your homepage. Use appropriate graphics to complement your lesson. Draw upon the readings, lectures, labs, profiles, and your own experiences to build your lesson. Your lesson should be at least 1250 words (do not exceed 1500 words). This will count as 20% of your final grade.
When you are finished with the lesson e-mail your TA with the URL of your portfolio.
Your lesson should include the following components:

**Introduction**
Describe the problem with which you will present the students. How long will the lesson take? What Ohio Content Standard will this lesson help your students to meet? Show how your lesson is designed for the class described in your teacher profile. The following questions should be addressed in your introduction:

- Do the students have special needs? If so, how will you take into consideration those needs in the lesson?
- How will you take into consideration the racial/ethnic/class/academic/gender makeup of the class in your lesson?
- What are the attitudes of the students towards the topic, computers, the Internet and how will you address those attitudes? Consider issues related to race, class, ethnicity, learning style, ability, academic level and gender.
- What are the technical abilities of the students and how will you take those abilities into consideration?
- How will you accommodate your level of comfort/ability with technology?
- How will you take into consideration the technical resources at your disposal?
- Is there anything else about the class that is important to take into consideration in order for all the students to successfully complete the lesson?

**Tasks**
Describe what the end result of the learners' activities will be. The task could be a:

- problem or mystery to be solved;
- position to be formulated and defended;
• product to be designed;
• complexity to be analyzed;
• personal insight to be articulated;
• summary to be created;
• persuasive message or journalistic account to be crafted;
• a creative work, or
• anything that requires the learners to process and transform the information they've gathered.

If the final product involves using a technology tool (e.g., PowerPoint, Excel, the Web, video), mention it here. Some of the things to consider include a test, a template, a database, a spreadsheet, a presentation (electronic or not), a HyperStudio stack, a brochure, a web site/page, a slide show, an artistic piece, or a performance. Will you provide a template for them? Will they create their own? How will you make the tasks challenging, interesting, and doable for the intended students. How will you give them enough freedom to construct their own knowledge while keeping them on-task? What work, if any, will students be required to do outside of class?

**Process**
Describe the learning processes for the above tasks. The section should communicate how your lesson will flow. The processes should be broken down into clearly described steps.
Describe how you will guide the students to organize the information acquired and synthesize that information.
Will students work in groups or alone or both? Justify your choice(s). If they work in groups, describe the selection process and the makeup of the groups. Consider issues related to race, class, ethnicity, ability, learning style and gender.
Include descriptions of the role(s) to be played or perspectives to be taken by each student.

**Resources**
List the web/media/software/other sources needed to complete the task. If you are using web resources create links to those web sites. If the resource is within a web site, create a link as close as possible to the desired web page. Give a description of and justification for each resource. Describe any other resources that students will need in order to successfully complete the lesson. It's important to note that resources for the students are not restricted to those found on the web. Other resources may include textbooks, reference books, educational programs (e.g. CD-ROMs), audio cds, audio tapes, videos, etc.

It may make sense to divide the list of resources so that some are examined by everyone in the class, while others are read by subsets of learners who are playing a specific role or taking a particular perspective.

**Assessment**
Describe how you will assess student learning for this lesson. How will you communicate the lesson expectations to the students and how will you assess and communicate their progress? Specify whether there will be a common grade for group work vs. individual grades. For this section you will you create a rubric for the lesson. Will you use other ways to evaluate the students? If so, describe the other assessments that you will use? How would you communicate a student's performance to that student? To her/his parents? How is your assessment connected to an Ohio Content Standard? You may wish to use Howard Gardner's multiple intelligence theory as a guide to your approach to assessment. How would assess the following intelligences?

- **Visual-spatial** - Capacity to perceive the visual-spatial world accurately and to modify or manipulate one's initial perceptions
- **Bodily-kinesthetic** - Abilities to control one's body movements and to handle objects skillfully
- **Musical-rhythmic** - Abilities to produce and appreciate rhythm, pitch, and timbre, and appreciation of the forms of musical expressiveness
- **Interpersonal** - Capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people
- **Intrapersonal** - Knowledge of one's own feelings, strengths, weaknesses, desires, and the ability to draw upon this knowledge to guide behavior
- **Logical-mathematical** - The abilities to discern logical or numerical patterns and to handle long chains of reasoning.
- **Verbal-linguistic** - Sensitivity to the sounds, rhythms, and meanings of words; sensitivity to the different functions of language
- **Naturalistic** - The ability to understand, relate to, categorize, classify, comprehend, and explain the things encountered in the world of nature

**Conclusion**

Describe how you will bring closure to the lesson, remind the students about what they've learned, and encourages them to extend the experience into other domains and parts of the curriculum. Will student reflection factor into the conclusion? If so, how will you encourage them to reflect on the learning process? You might also include some rhetorical questions or additional links to encourage them to extend their thinking into other content areas beyond this lesson.

When you are finished, please email your TA to tell her/him that you are ready for your project to be evaluated. In your email include the URL of your site.

**Connection to your teacher profile**

Throughout your lesson you should state how your lesson takes into consideration your teacher profile. For example, you could mention how your choice of activities considers the number of computers in the classroom or you may wish to state how your choice of technology resources is age/curriculum appropriate for the learners described in your profile. Other connections to your teacher profile could include stating how your choice
of assessment complements your teaching philosophy or how the level of technology integration that you selected is consistent with your approach to technology integration. Your project will be evaluated using the following rubric:

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>• Well defined, concise, and clearly stated purpose of the lesson, lesson length and intended audience (i.e. student needs and abilities)</td>
<td>• More information needed for a clear purpose</td>
<td>• Intro / purpose of the lesson does not match your teacher-profile.</td>
</tr>
<tr>
<td></td>
<td>• Clear description of your teacher's resources and abilities</td>
<td>• Description of the target audience is stated but needs more elaboration</td>
<td>• No clear purpose, lesson length or audience</td>
</tr>
<tr>
<td></td>
<td>• Lesson clearly connected to an Ohio Content Standard</td>
<td>• Lesson connected to an Ohio Content Standard</td>
<td>• Lesson not connected to an Ohio Content Standard</td>
</tr>
<tr>
<td><strong>Task</strong></td>
<td>• Tasks clearly stated, focused, creative and attainable</td>
<td>• Follows a logical order</td>
<td>• Most tasks too vague or too easy</td>
</tr>
<tr>
<td></td>
<td>• Task allows for multiple kinds of learning</td>
<td>• Some tasks too vague or too easily attainable</td>
<td>• Tasks difficult to attain or judge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tasks relevant but not appropriate</td>
<td>• Tasks unordered</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>• Process should be broken down into clearly described / defined steps</td>
<td>• Steps are clearly sequenced but don’t anticipate</td>
<td>• Process not broken down into manageable and attainable</td>
</tr>
<tr>
<td>Resources</td>
<td>Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| - Conscious of diversity issues  
- Anticipates needs of learners  
- Lesson flows and has good transitions  
- Group choices, student roles and teacher roles well described  
- Lesson can be duplicated | - Assessment sets clear expectations for students and is clearly related to the lesson  
- Rubric does not take into account all needs of the students or their technical abilities  
- Assessment not aligned with lesson  
- Does not communicate expectations |
| needs of students or pay attention to grouping or student and teacher roles  
- Can be duplicated but with ambiguities | |
| - Resources appropriate (for students and lesson) and accessible  
- Evidence that resources have been review (clear justification of choices)  
- Uses multiple media (optional) | |
| - Resources somewhat appropriate and accessible  
- Unclear justification  
- Resources relevant but not appropriate | |
| - Resources not appropriate, sufficient, accessible, nor meets target audience.  
- No clear justification  
- Resources difficult to access. | |
| Rubric that fairly takes into account special needs and technical abilities of students | No specific details of group and student evaluation | Assessment too complex or too narrow |
| Details of group and student evaluation included | Some feedback but not specific enough | No feedback mechanisms |
| Uses more than one form of assessment | Self evaluation not encouraged | Assessment not connected to an Ohio Content Standard |
| Provides adequate feedback mechanisms | Assessment connected to an Ohio Content Standard |
| Assessment clearly connected to an Ohio Content Standard |

<table>
<thead>
<tr>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conclusion summarizes learning task and encourages further learning, exploration, and reflection in class, at home, and/or in the community.</td>
</tr>
<tr>
<td>Conclusion only summarizes learning tasks but doesn’t encourage further reflection and exploration or provide resources for closure</td>
</tr>
<tr>
<td>Conclusion does not align with lesson and does not encourage students to reflect on what they were to learn.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connection to Teacher-profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lesson makes consistent connections to</td>
</tr>
<tr>
<td>The lesson makes connections to the teacher-</td>
</tr>
<tr>
<td>The lesson makes few or no connections to</td>
</tr>
</tbody>
</table>
the teacher-profile. It adequately takes into consideration the class and teacher characteristics.

- The lesson includes all of the central aspects of the class and teacher including class size, technology resources, diversity, curriculum, and the teacher's level of technical knowledge/experience as well as teaching/assessment philosophy.

The lesson profile, but they are not all consistent. The lesson does not take into consideration one of the central aspects of the teacher-profile.

The lesson misses many of the central aspects of the teacher-profile.

Revised:
Contact: voithofer.2@osu.edu
APPENDIX D

E-PORTFOLIO HANDOUT

Portfolio Requirements

Your portfolio capstone has 5 main aspects: 1) the navigation structure itself; 2) your pedagogy statement developed in Ped I; 3) selected course assignments; 4) documentation of your student teaching; and 5) final reflective pieces.

1. Navigation Structure:
You began your navigation structure this summer with Dr. Brown. Before the end of Fall quarter, you should be sure that your webpage’s structure is fully drafted (you may change elements later), and that the links work. Make use of the tech GAs’ clinic times if you have “knots” to work out.

2. Your Pedagogy Statement:
Dr. Hartantor is returning the second drafts over the next few weeks. When you receive yours, you can upload and link it to your webpage. Email your tech GA so that she can look for it.

3. Course Assignments:
In each of your Fall and Winter Method courses (social studies, equity and diversity, mathematics, science, reading decision-making and guidance), you will complete a number of assignments. For each course, you need to select ONE of those assignments for your portfolio. Your instructor will indicate which among these assignments is appropriate for your portfolio. After receiving a round feedback from your professor on that assignment, you should polish it up and re-submit it to that professor, ideally within the final week of that quarter. Let him/her know that this is your portfolio choice for that course. Then, you will receive it back again, possibly with further suggestions for making it a terrific piece for your capstone portfolio. At this point, you can upload and link it to your webpage – choose one of the program themes as the “place” for that assignment.
Write a brief introduction to that assignment to provide context (a few paragraphs) and highlight the theme in that introduction. When you have uploaded your assignment, you should email your tech GA and let her know so that she can check it out. This should happen as close to the end of each quarter as possible. If you are waiting for that assignment to be returned from your professor, please let you tech GA know that.

4. Documentation of Student Teaching:
We will talk about this later when you are closer to it.

5. Final Reflective Pieces:
Final reflective pieces will be constructed during capstone seminar next summer.

**Timeline**

A. At the end of the Autumn Quarter you should have:
- Created a navigation structure
- Uploaded your Pedagogy Statement
- Uploaded one selected assignment from your Social Studies coursework *(or very early in the Winter Quarter)*
- Email Shwu-Meei (Gray Cohort) and Ilknur (Scarlet Cohort) to check your website.

B. At the end of the Winter Quarter you should have:
- Uploaded one selected assignment from your Science coursework *(or very early in the Spring Quarter)*
- Uploaded one selected assignment from your Mathematics coursework *(or very early in the Spring Quarter)*
- Uploaded one selected assignment from your Equity and Diversity coursework *(or very early in the Spring Quarter)*
- Uploaded one selected assignment from your Reading Decision-Making and Guidance coursework *(or very early in the Spring Quarter)*
- Practiced digital photo and scanning
- Polished your navigation structure
- Email Shwu-Meei (Gray Cohort) and Ilknur (Scarlet Cohort) to check your website.

C. At the end of the Spring Quarter you should have:
- Created documents for your student teaching
- Email Shwu-Meei (Gray Cohort) and Ilknur (Scarlet Cohort) to check your website.

D. At the end of the Summer Quarter you should have:
- Uploaded the content and documentation for your student teaching
- Uploaded your final reflective pieces
- Polished your portfolio
- Email Shwu-Meei (Gray Cohort) and Ilknur (Scarlet Cohort) to check your website.

**Computer Clinics Schedule**

This quarter computer clinics will be held in **Stillman Hall 235** for the following schedule:
You are welcomed to come to the computer lab. Ilknur and Shwu-Meei would be very happy to work with your questions! You can contact with Shwu-Meei by email (chen.802@osu.edu) or phone (688-xxxx), or with Ilknur by email (kelceoglu.1@osu.edu) or phone (247-xxxx / 459-xxxx).

**Digital Supplies Check Out Rules**

The digital supplies are available for checking out from now through Spring quarter (except for the quarter break).

**Follow these steps to check out the supplies:**

1. The digital supplies are stored in Edgar-Dale Media library (Ramseyer Hall 260). The available hours for checking and returning are from **Monday to Thursday 1:00–7:00pm, and Sunday 1:00-5:00pm**.

2. Bill (edgar-dale@osu.edu) will help with you for checking out the digital supplies. Call Bill (292-XXXx) ahead before you go to Edgar-Dale Media library.

3. For each check out, you have 2 weeks to use the digital supplies.

4. You will sign the Digital Supply Check Out Form and schedule a return day with Bill at the day of check out.

5. A reminder email of the due day will be sent to you.

**Important:**

※ **Students will take the responsibility to take care of the digital supply.**

※ **Students need to return the complete kit on time.**
<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Box # 1</strong></td>
<td>Complete Kit:</td>
</tr>
<tr>
<td></td>
<td>- Fuji digital camera</td>
</tr>
<tr>
<td></td>
<td>- battery re-charger</td>
</tr>
<tr>
<td></td>
<td>- media card</td>
</tr>
<tr>
<td></td>
<td>- zip driver</td>
</tr>
<tr>
<td></td>
<td>- reader writers</td>
</tr>
<tr>
<td><strong>Box # 2</strong></td>
<td>- Fuji digital camera</td>
</tr>
<tr>
<td></td>
<td>- battery re-charger</td>
</tr>
<tr>
<td></td>
<td>- media card</td>
</tr>
<tr>
<td></td>
<td>- reader writers</td>
</tr>
<tr>
<td><strong>Box # 3</strong></td>
<td>- Fuji digital camera</td>
</tr>
<tr>
<td></td>
<td>- battery re-charger</td>
</tr>
<tr>
<td></td>
<td>- media card</td>
</tr>
<tr>
<td></td>
<td>- reader-writer</td>
</tr>
<tr>
<td><strong>Box # 4</strong></td>
<td>- Fuji digital camera</td>
</tr>
<tr>
<td></td>
<td>- battery re-charger</td>
</tr>
<tr>
<td></td>
<td>- media card</td>
</tr>
<tr>
<td></td>
<td>- reader-writer</td>
</tr>
<tr>
<td><strong>Box # 5</strong></td>
<td>- Olympus digital camera</td>
</tr>
<tr>
<td></td>
<td>- battery re-charger</td>
</tr>
<tr>
<td><strong>Box # 6</strong></td>
<td>- Olympus digital camera</td>
</tr>
<tr>
<td></td>
<td>(you will need to supply 2 AA-size batteries)</td>
</tr>
<tr>
<td><strong>Box # 7</strong></td>
<td>- Fuji digital camera</td>
</tr>
<tr>
<td></td>
<td>(you will need to supply 2 AA-size batteries)</td>
</tr>
<tr>
<td><strong>Box # 8 - # 27</strong></td>
<td>Complete kits (refer to Box # 1)</td>
</tr>
</tbody>
</table>
APPENDIX E

E-PORTFOLIO STRUCTURE
Electronic Portfolio

Welcome to my homepage...

Introduction to the electronic portfolio.

Educational Philosophy

Educational Philosophy Statement (Pedagogy Statement)....linked to four strands of the ITL MEd program.
Theoretical statement about Learning and Developing… 3-5 Pages.

Based on course readings. Substantive discussion of theory and practice.

Linking Paragraphs are explicit statements that provide the link between your theoretical statements and your examples of your work. These connections may also be embedded within theoretical statement.
APPENDIX F

SURVEY QUESTIONNAIRE

Electronic Portfolio Survey
Shwu-Meei Chen

This survey is for my dissertation study. Its purpose aims to collect a database regarding your overall learning experience and perception of electronic portfolio as a preservice teacher. The comments are voluntary. Your effort in providing as much as detail insight as you can will be greatly appreciated. Your response will help educators to implement electronic portfolio in the field of teacher education.

General Information:
1. Your age group is: (circle one)
   20s / 30s / 40s / Above

2. Your gender is:
   Female / Male

3. Your cohort is:
   Gray / Scarlet

4. Your last four social security number: _____________________

5. The hardware/software you have at home:
   PC computer / MAC computer / Scammer / Digital Camera / FrontPage software /
   Microsoft Word / Internet access / other:

6. Your any prior experience with electronic portfolios before the M.Ed. program:
   None / Yes. I had the experience when ________________________________.

7. Your teaching position for next year:
   None / Yes. I will teach in ________________________________
   (school/district).
Please respond to the following statements based on whether you Strongly Agree, Agree, Undecided, Disagree, or Strongly Disagree.

<table>
<thead>
<tr>
<th><strong>As a student developed the electronic portfolio in the M.Ed. Program,</strong></th>
<th><strong>Strongly Agree</strong></th>
<th><strong>Agree</strong></th>
<th><strong>Undecided</strong></th>
<th><strong>Disagree</strong></th>
<th><strong>Strongly Disagree</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was aware that the electronic portfolio was a requirement of program completion at the beginning of the school.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. I was interested in developing my e-portfolio in the beginning.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. I enjoyed the process of developing my electronic portfolio.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. I was comfortable to upload my work in my e-portfolio.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. I was proud of my work of e-portfolio.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. I learned sufficient technological skills to develop my e-portfolio in the technology course (P&amp;L 791).</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. I acquired sufficient technical skills to help my teaching.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8. I learned how to use technology to enhance my teaching and learning.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>9. I understood e-portfolio is a cultural tool to mediate teaching and learning.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>10. I feel ownership of my e-portfolio.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>11. I know how to create a portfolio in the future.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>12. I valued the e-portfolio is authentic assessment.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Statement</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Undecided</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
<td>-----------</td>
<td>----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>13. the e-portfolio was integrated into each of my M.Ed. course.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>14. instructors in the program were willing to help me in developing my e-portfolio.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>15. the e-portfolio was an important aspect of the M.Ed. program.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>16. the program provided enough support for me to develop my e-portfolio.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>17. I received technical aid from technology assistants.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>18. I was given directed instruction for doing my e-portfolio assignments.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>19. the e-portfolio helps me to reflect on my learning experiences in the M. Ed. program.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>20. the e-portfolio helped me to be aware of who I am as a beginning teacher.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>21. the e-portfolio helped me to see my change throughout the whole school year.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>22. the e-portfolio presents my best capabilities as a beginning teacher.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>23. the e-portfolio helped me open-minded to share my learning experience with others.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>24. the e-portfolio helped me to become a reflective thinker.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
In the following statement, please rank your 3 highest choice (1 is most important; 2 is next important; etc.)

25. The 3 most important purposes for developing my e-portfolio were:
   ___ show my growth and change.
   ___ document/collect my learning experience
   ___ self-reflect upon my teaching and learning
   ___ present in a job interview
   ___ complete the M.Ed. requirements
   ___ show my technology competency
   ___ other ______________

26. The 3 most important things I learned from developing my e-portfolio were:
   ___ acquisition of specific technological skills
   ___ knowledge of teaching and learning
   ___ knowledge of technology integration
   ___ Knowledge of e-portfolio
   ___ other ______________

27. The three most important advantages of developing an e-portfolio were:
   ___ learning about technology
   ___ showing the qualification of teaching and learning
   ___ presenting my learning through multiple paths
   ___ sharing my learning with others easily
   ___ portable and easy to update
   ___ more powerful and convenient than a traditional portfolio (paper-based)
   ___ convenient way to track learning, change, and growth
   ___ useful tool/assessment approach in my future teaching
   ___ helpful presentation in job interviews
   ___ other ______________

28. The three most important disadvantages of developing an e-portfolio were:
   ___ time demand
   ___ lack of technology skills
   ___ inadequate equipments
   ___ server space limited
   ___ privacy
   ___ cyber plagiarism
   ___ other ________________

29. The most three helpful resources for helping me to develop my e-portfolio are:
   ___ rich technological equipment
   ___ relevant courses
   ___ technology course
   ___ instructors’ assistance
   ___ help from technology assistants
   ___ other ___________________________
30. Check skills you had before developing e-portfolios.
   ___ upload/download file and pictures
   ___ scanning/ saving images
   ___ using digital camera
   ___ PowerPoint presentation
   ___ FrontPage
   ___ Excel
   ___ designing webpage
   ___ publishing web on the Internet
   ___ creating a web-based lesson
   ___ integrating technology into lesson
   plans
   ___ other____________________

31. Check skills you have after completing your e-portfolios.
   ___ upload/download file and pictures
   ___ scanning/ saving images
   ___ using digital camera
   ___ PowerPoint presentation
   ___ FrontPage
   ___ Excel
   ___ design webpage
   ___ publish web on the Internet
   ___ create a web-based lesson
   ___ integrating technology into lesson
   plans
   ___ other____________________

32. The courses that made connection to my e-portfolio were: (please check)
   ___ Media and Technology in Education
   ___ Student teaching
   ___ Social study
   ___ Math
   ___ Science
   ___ Diversity and Equity
   ___ Literacy
   ___ Capstone Course

33. I shared my e-portfolios with: (please check)
   ___ instructors
   ___ peers
   ___ friends
   ___ mentor teachers
   ___ supervisors
   ___ family

In the following question, please give your comment as detailed as you can.

34. In your future career, how do you plan to use or adapt the electronic portfolio that you create?

35. What suggestions would you will give future cohort students to develop a successful electronic portfolio?

36. Do you have any suggestions for improving the e-portfolio project in the M.Ed. program?

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APPENDIX G

E-PORTFOLIO FEEDBACK FORM

Integrated Teaching and Learning
Early Childhood Master’s Capstone
Portfolio Feedback SU 2004

<table>
<thead>
<tr>
<th>Categories of criteria</th>
<th>Feedback</th>
<th>Rating</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning and Development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philosophical Commitment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversity (Assumed in Equity &amp; Diversity statement)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linking Paragraphs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity and Diversity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philosophical Commitment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linking Paragraphs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name:
<table>
<thead>
<tr>
<th>Families and Community</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing</td>
<td></td>
</tr>
<tr>
<td>Philosophical Commitment</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td></td>
</tr>
<tr>
<td>Diversity (Assumed in Equity &amp; Diversity statement)</td>
<td></td>
</tr>
<tr>
<td>Linking Paragraphs</td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
</tr>
<tr>
<td>Constructing Curriculum</td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td></td>
</tr>
<tr>
<td>Philosophical Commitment</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td></td>
</tr>
<tr>
<td>Diversity (Assumed in Equity &amp; Diversity statement)</td>
<td></td>
</tr>
<tr>
<td>Linking Paragraphs</td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
</tr>
</tbody>
</table>

Documenting Student Teaching *See “Documenting Student Teaching” for components of individual sections.

<table>
<thead>
<tr>
<th>Categories of criteria</th>
<th>Feedback</th>
<th>Rating</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Feedback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Components</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflection on Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

235
| Document a Child | | |
|------------------|-----------------|
| General Feedback | | |
| Writing          | | |
| Components       | | |
| Documentation    | | |
| Family/Community Connection | | |
| General Feedback | | |
| Writing          | | |
| Components       | | |
| Documentation    | | |
| Final Reflection  | | |
| Writing          | | |
| Components       | | |
| Connection to four ITL strands | | |

<table>
<thead>
<tr>
<th>E-Portfolio Design- Navigation Structure, and Page Format</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Category of criteria</td>
<td>Feedback</td>
</tr>
<tr>
<td>Navigation structure; links; color/contrast; spacing and font readability</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overall</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Category of criteria</td>
<td>Feedback</td>
</tr>
<tr>
<td>Content</td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td></td>
</tr>
<tr>
<td>Creative use of Technology</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX H

### E-PORTFOLIO REBRIC

Integrated Teaching and Learning  
Early Childhood Master’s Capstone  
Portfolio Rubric SU 2004

Theoretical Statements

<table>
<thead>
<tr>
<th>Theoretical Statements</th>
<th>Exceptional (A)</th>
<th>Effective (A-)</th>
<th>Acceptable (B)</th>
<th>Unsatisfactory (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Writing</strong></td>
<td>Clear and concise – no grammatical or other errors</td>
<td>Clear and concise – few grammatical or other errors</td>
<td>Not clear or concise with some grammatical or other errors</td>
<td>Not clear or concise with many grammatical or other errors</td>
</tr>
<tr>
<td><strong>Philosophical Commitment</strong></td>
<td>Clearly articulated and well argued</td>
<td>Clearly articulated</td>
<td>Not clearly articulated</td>
<td>Not clearly articulated and not argued well</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td>Well supported through citations to course readings</td>
<td>Supported through citations to course readings</td>
<td>Some citations but not well supported through citations to course readings</td>
<td>Not supported sufficiently through citations to course readings</td>
</tr>
<tr>
<td><strong>Diversity</strong> (Assumed in Equity &amp; Diversity statement)</td>
<td>Connections to learners from diverse settings are clear and appropriately included within statement</td>
<td>Connections to learners from diverse settings are clear but not included appropriately (e.g., “add on” or after thought”) within statement (for all theoretical statements except Equity and Diversity)</td>
<td>Connections to learners from diverse settings is an “add on” &amp; not integral to overall discussion</td>
<td>Little or no relation to learners from diverse settings</td>
</tr>
</tbody>
</table>
| Linking Paragraphs | •Connections between statement and examples are clear and appropriate  
  •Effectively transitions the reader from your theoretical statement (research) to practice | •Connections between statement and examples is clear but lacks appropriateness in some way  
  •Transitions the reader from research to practice but is somewhat awkward | •Connections between statement and examples are not clear or appropriate  
  •The transition from research to practice is unclear. | *Connections between statement and examples are not developed clearly  
  *Linking paragraph(s) do(es) not show the transition from research to practice |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>Examples represent clear exemplars for theoretical stance</td>
<td>Examples are linked to the theoretical stance but not clear exemplar work</td>
<td>Examples are loosely connected to theoretical statement and not clearly exemplars</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Documenting Student Teaching</th>
<th>*See “Documenting Student Teaching” for components of individual sections.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing</td>
<td>Exceptional (A)</td>
</tr>
<tr>
<td>Components</td>
<td>All components included and documentation included for each</td>
</tr>
<tr>
<td>Documentation</td>
<td>Descriptions are well documented with photos, scanned documents, etc.</td>
</tr>
<tr>
<td>Description of Setting</td>
<td>Description provides reader with understanding of setting and students</td>
</tr>
<tr>
<td>Document a unit of study</td>
<td>Description provides reader with understanding of planning, unit activities, etc.</td>
</tr>
<tr>
<td>Reflection on Unit</td>
<td>Discussion includes indication of the following:</td>
</tr>
<tr>
<td>What went well?</td>
<td>What didn’t?</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Document a Child</td>
<td>Reader is provided a clear image of the child developmentally and academically. Goals are clearly defined.</td>
</tr>
<tr>
<td>Family/Community Connection</td>
<td>Description provides reader with understanding of connection to families/community</td>
</tr>
<tr>
<td>Final Reflection</td>
<td>Deep reflection on student teaching experience integrates all four strands of ITL program</td>
</tr>
</tbody>
</table>

E-Portfolio Design- Navigation Structure, Page Format, and Photos/graphics

<table>
<thead>
<tr>
<th>Exceptional (A)</th>
<th>Effective (A-)</th>
<th>Acceptable (B)</th>
<th>Unsatisfactory (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent navigation structure</td>
<td>Consistent navigation structure</td>
<td>Consistent navigation structure</td>
<td>Inconsistent navigation</td>
</tr>
<tr>
<td>All links work</td>
<td>All links work</td>
<td>Most links work</td>
<td>Some links work</td>
</tr>
<tr>
<td>Appropriate color/contrast, spacing and font for readability</td>
<td>All links work</td>
<td>Some readability</td>
<td>Minimal readability</td>
</tr>
<tr>
<td>Meaningful use of photos and scanned documents</td>
<td>Some readability</td>
<td>Not enough meaningful photos and scanned documents</td>
<td>Photos and scanned documents not meaningful</td>
</tr>
</tbody>
</table>

Overall

<table>
<thead>
<tr>
<th>Content</th>
<th>High level of original thought</th>
<th>Original Thought Considerable Effort</th>
<th>Limited original thought Some effort</th>
<th>Lacks original thought Limited effort, depth, and breadth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerable effort</td>
<td>Demonstrates some depth and breadth</td>
<td>Lacks depth and breadth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------</td>
<td>------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td>Well organized Easy to navigate</td>
<td>Organized Easy to Navigate</td>
<td>Somewhat organized Sometimes confusing to navigate</td>
<td>Poorly organized Difficult to navigate</td>
</tr>
<tr>
<td><strong>Creative use of Technology</strong></td>
<td>Polished AND Unique Design</td>
<td>Polished OR unique design</td>
<td>Somewhat polished and/or unique design</td>
<td>Lacks polish and unique design</td>
</tr>
</tbody>
</table>
APPENDIX I

EMAIL MESSAGE 1

Dear All:

Some students came in the computer lab to work on their e-portfolio today. I like to share some thoughts (which are most students asked and concerned) with you.

1.) Some students came in the lab and cannot do a change on their works because of a server problem. Please try to log in your website to make sure it runs okay. If you have any problem with your website, please email Jan (dow.3@osu.edu) as soon as possible.

2.) Most students asked where to upload the pedagogy statements and the social studies assignment. For the pedagogy statement, you can upload it to your educational philosophy page (either cut or paste to the page or hyperlink it). For your social study assignment, you need to decide which theme is more connected with it. I strongly suggest that you re-read the M.Ed. portfolio requirements handout. It will help you to understand the requirements more.

3.) Some students asked how to upload word files. There are some steps that you can try to follow:
   ---open your word document/file
   ---click on save as, when the window pop out, choose my network places
   ---click on your website address, then you will be asked to type your password and username, click on ok
   ---close your FrontPage and re-open it and the word file will be uploaded into your FrontPage.
   ---create a hyperlink to link your word file.

Hope the information will help you to do the work!

Yours
Shwu-Meei
(Email message 12/02/03)
Hi, Dear All:

The last computer clinic for this quarter will be at the Stillman Hall 235 from 1:00 to 3:00 pm on Dec 2nd (Tuesday). If you have any question to ask, please try to come in. And, also keep in mind to send me email when your website are ready be checked.

Look at the portfolio requirements for Autumn Quarter on the sheet again. And make sure you did the following things:

1. Created a navigation structure
2. Uploaded the Pedagogy Statement
3. Uploaded one selected assignment from your Social Studies coursework (or very early in the Winter Quarter)
4. Email Shwu Meei to check your website

I hope that I could have your email by Dec. 12th. If you have difficult to match the deadline, please inform me, I could make a note for checking you off later. Thanks.

Yours

Shuw-Meei

(email message 11/30/03)
Dear All:
We have an announcement and a reminder regarding your electronic portfolios:

We would like to announce you that the digital supplies now are stored in Arps Hall 015. If you like to check out the digital supplies for your student teaching, you need to contact with Brock Hertzfeld. Brock will help you for checking out the digital supplies. Please call (292-6830) or email (hertzfeld.7@osu.edu) him before you go there. We hope that this information helps!

We also would like to remind you that at the end of the Winter Quarter you should have:
* Uploaded one selected assignment from your Science coursework (or very early in the Spring Quarter)
* Uploaded one selected assignment from your Mathematics coursework (or very early in the Spring Quarter)
* Uploaded one selected assignment from your Equity and Diversity coursework (or very early in the Spring Quarter)
* Uploaded one selected assignment from your Reading Decision-Making and Guidance coursework (or very early in the Spring Quarter)
* Practiced digital photo and scanning
* Polished your navigation structure and
* Sent email Shwu-Meei (Gray Cohort) and Ilknur (Scarlet Cohort) to check your website.

We will be looking forward to see your uploaded electronic portfolios.
Have a great break!

Yours,
Shwu-Meei
(Email message 03/19/04)
APPENDIX L

HANDOUT OF DOCUMENTING STUDENT TEACHING

Description of the setting
Describe the context in which you are teaching including the community, school, classroom, teacher, children and curriculum. Make sure to address the social, cultural, class-based, political and community norms/values/behaviors. Possible documentation includes photos (be creative), scanned documents, selective writing, quotes from teachers, children, parents, or other community members.

Document the unit of study
Describe the planning process, the planned activities, the unplanned responses of the children, standards and objectives addressed, outcome of the unit, assessment processes, and your final thoughts/reflections on the unit of study. Possible documentation includes scanned lesson plans, children's work, digital photos, quotes taken from audiotapes of the events, scanned assessment pieces, etc.

Document a child (no photos or names here please)
Describe what you know about this child and their current academic performance in one content area. In addition, you may also choose to describe the student more broadly. Provide a summative description of his or her current level of performance and describe your goals for this child as well (You may build upon case studies done in your coursework).

Document a Significant Community/Family/School Connection
Describe an effort on your part to connect with the child's community and/or family. What were your goals and intentions in establishing this connection or creating this curriculum? Documentation might include scanning regular newsletters to parents, scanning notes from ongoing phone/in-person conversation with parent(s), documentation of home visits, the development of curriculum specifically designed with your children's experiences in mind, documentation of a community project (community garden), documentation of student-led parent teaching conferences, or documentation of projects oriented toward social justice.

Final Reflection: On Becoming a Beginning Teacher
This may take many forms and should be a culminating piece of writing that brings together many of the facets of the MEd program and your capstone. It will be developed during the capstone this summer.
### APPENDIX M

#### THE EXAMPLE OF FILD NOTES

**Location:** At R 235 Stillman Hall public computer lab  
**Date:** 1/28/04 **Time:** 4:00-4:30 P.M.  
**Purpose:** Observe M.Ed. students’ learning activities of doing e-portfolio. What are their most problems of computers? How they (M.Ed. students/ technology supervisor) approach to each other? How M.Ed. students react when they encounter technological problems?

<table>
<thead>
<tr>
<th>Setting</th>
<th>Observer comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was snowing; the weather forecast reported that this afternoon weather would be very bad caused by icy rain. I was afraid that students would not come into computer lab due to the weather situation.</td>
<td>I, as an observer and a tech assistant, expected to see many of students to be there. I still considered the amount of student will matter with the observation. Did I care the quality or quantity of the observation?</td>
</tr>
</tbody>
</table>

When I arrived the room, I saw the sign “this lab has been reserved for a class from 4:00-6:00 pm” posted in the door. I opened the door carefully to walk into the room. The lab has 30 PCs arranged within 5 rows, one printer, one scanner, and one projector set in front of the room. I saw that Ilknur was talking with one M.Ed. student. She could not log into her website and the supervisor tried to help. One white male and four white females worked on their works alone. They look pretty young (around 25). I said “hi” to them. I walked around the room for observing and work with them.

A pairs of student sat in the forth row and two pair of students sat in the third row. Sometime they talk with other for

I have my position in the computer lab. I feel I am more comfortable to be in the room. They sat with peer. It is convinced for them to ask for helping if they have problem.

Because the supervisor is an international Ph.D. student who is from the Turkey, I wonder those young students pay attention to talk with her.

It means to me that the M.Ed. students’ works are respected. And the program created a learning environment for them to learn. M.Ed. students get the support from the program for doing their e-portfolio.
asking question.

The students, who could not log in to website, tried several times still cannot make it. I suggested her to change another computer to try. But it did not work too. I told her that I cannot help with her. She must send e-mail to Georgia who take care the server. The student said: “I am sick of the machine. I could log into my website at my home. How come it happen this problem here?” Ilknur told her it is machine and it happens sometime. The students left.

One student raised her hand. I came to her. She had a problem of how to upload the assignment. I told her how to do and student do it following step by step. Another student sat beside her stopped her work to listen.

The student uploaded her assignment successfully. I told the student to write several paragraphs to reflect her learning. I explained what reflection is. The student looked confused. I explained it again. This time more students who around the students, all listened; some wrote down the notes.

An African-American male student did not pay attention to the conversation. I walked closely to look his works. He smiled at me. I asked him how his work was. Did he have any problem? He told me that he is very pretty good at the computer. He showed me his works proudly.

The student and tech assistants work together for solving the problem. The student seemed angry and frustrated about the machine. I am Ilknur tried to help. The student did not feel comfortable to work on the computer and did not pay patient to solve the problem. I demonstrated the knowledge that student should work with the computer patiently. I does not only help students’ technical problem but also need to teach students to have positive attitude toward technology.

Students know what to get helps. I valued student’s hands on experience.

She likes to learn also. Maybe she has same problem. By listening the tech assistant’s explanation, she can solve her problem. I begin to understand that students come to lab do not only for learning technical skills but also knowledge of technology. The learning in here became more like a lecture. The student did not quite understand my explanation. I guessed it is related the language issue. I assumed it because of my international student experience.

Maybe he did not feel comfortable to ask question. I decided to ask question. I realized that tech assistants cannot just wait for students to come to them. I need to put myself into a participant. If I step outside of content, I would never understand the thing I observed.
### APPENDIX N

#### SURVEY QUESTIONNAIRE RANKING EXAMPLE

Example of ranking three most important things learned from developing e-portfolio (question 26)

<table>
<thead>
<tr>
<th>Ranking Items</th>
<th>3 = ranking the first importance</th>
<th>2 = ranking the second importance</th>
<th>1 = ranking the third importance</th>
<th>Total points</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition of specific technological skills</td>
<td>9 (students ranked) (9x3=27)</td>
<td>17 (17x2=34)</td>
<td>4 (4x1)</td>
<td>27+34+4=65</td>
<td>65/186=35%</td>
</tr>
<tr>
<td>Knowledge of teaching and learning</td>
<td>1 (1x3=3)</td>
<td>2 (2x2=4)</td>
<td>11 (11x1=11)</td>
<td>3+4+11=18</td>
<td>18/186=10%</td>
</tr>
<tr>
<td>Knowledge of technology integration</td>
<td>6 (6x3=18)</td>
<td>8 (8x2=16)</td>
<td>9 (9x1=9)</td>
<td>18+16+9=43</td>
<td>43/186=23%</td>
</tr>
<tr>
<td>Knowledge of e-portfolio</td>
<td>14 (14x3=42)</td>
<td>4 (4x2=8)</td>
<td>6 (6x1=6)</td>
<td>42+8+6=56</td>
<td>56/186=30%</td>
</tr>
<tr>
<td>Other</td>
<td>1 (1x3=3)</td>
<td>0 (0x2=0)</td>
<td>1 (1x1=1)</td>
<td>3+0+1=4</td>
<td>4/186=2%</td>
</tr>
<tr>
<td>Total points</td>
<td>93</td>
<td>93</td>
<td>93</td>
<td>186</td>
<td>100%</td>
</tr>
</tbody>
</table>