Using a Reflective Process to
Implement Electronic Portfolios

by

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(ABSTRACT)

This case study documents the stages, procedures, and interactions between a researcher and a public school teacher during the implementation of electronic portfolios. The primary topics highlighted are: general information regarding portfolios; reflection; and issues that arose during the study.

The classroom teacher in this particular study worked in Southwest Virginia at a modern vocational facility, and she had expressed a desire to master the various technologies necessary to implement electronic portfolios. The researcher was competent in these technologies; her objective was to ascertain the methods and materials, and other processes in which electronic portfolios could be implemented in a public school setting. The collaboration between the researcher and the teacher provided for an arrangement wherein the teacher often learned the technologies simultaneously, along with her students. The researcher's ongoing assistance also offered the teacher time to concentrate on the various management aspects of the project.

Reflection was developed as a critical component of the process. It was instrumental for the students, the teacher, and the researcher. Students were required to write "reflections" about the artifacts they had chosen for their electronic portfolios. The researcher and the teacher would meet regularly to reflect on the project's status; methods and materials; management issues; and even to reflect on reflection itself, and the methods to take the students deeper as it pertained to *their* reflections on any given artifact.

Three aspects of the process revealed themselves to be major components that would be inescapable considerations for any classroom teacher who wished to implement electronic portfolios: the technology; the reflective writing process; and management issues. The management issues generally pertained to time issues.

This study was successful because it proved to identify the essential components of an electronic portfolio project. And, lastly the collaboration between the teacher and the researcher proved to be successful because the two major objectives of the study were achieved: the teacher mastered the technology (and the process) necessary to implement electronic portfolios; and the researcher identified, correlated, and recorded this discovery so that it might be replicated.

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Chapter One

Introduction

Two purposes guided this research. One, to describe how one teacher implemented electronic portfolios in her classroom, and two, how a collaborative/reflective process with a university researcher was used in this implementation process. The idea of this study was borne out of the opportunity that I was given to be involved in a program to continue and expand on a developing school-university partnership. I was given a position as clinical faculty, where I would do outreach with K-12 schools, a job that I had been doing the past two summers as part of a state-wide technology training pilot project. In order to introduce and frame this study I want to share in this chapter my entrée into the setting and the development of my relationship with my collaborator, Teresa.

The opportunity to be a part of this program was quite unique. The funds were made available through the Dean's office for the College. Both the university and the school system were looking to bolster this relationship with new and innovative ideas. From what I could tell, the main focus of my sketchy job description was to go to Franklin County Public Schools (FCPS) and help the teachers use technology. It was my understanding that I would work with teachers on an individual basis and would "help" them use technology in their classrooms. The teacher would act as the content "expert;" I would be the technology "expert." I would work with a teacher for a length of time to help him/her implement technology into his/her instruction. As the teacher became increasingly familiar with the technology, I would ease my way out of the classroom.

Upon my first visit to FCPS, the FCPS Instructional Technology Coordinator, who would serve as my direct liaison, affirmed my understanding of my role. My role would be to work at the Center for Applied Technology and Career Exploration (CATCE), FCPS's new technology center, and help the teachers integrate technology into their instruction. What she did not tell me was that the teachers would not get into the building until the week before school started. This meant that they would have had no access until that week to the technology or to the software that they ordered for their individual modules. Needless to say these teachers were not prepared for the school year to begin. While they had been planning their curriculum for two years, had attended

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numerous training sessions, and had the autonomy to choose the software that they wanted for their modules, they did not have time to be in the new building and begin to think about how to integrate the technology into their instruction and practice using this software.

This technology center was like no other in the United States. The intention of this Center was to allow eighth graders an opportunity to develop the skills needed for successful entry into the workforce. The Center was divided into eight modules, each representing a different career. The curriculum was problem-based with many hands-on activities. Approximately 30 students, or "interns," were enrolled each semester in each module. There were two teachers in each module and the teachers were called "facilitators." The plan was that these "interns" and "facilitators" were to spend their day as if each module was a business with business meetings being held and individual and group meetings scattered throughout the day.

The Instructional Technology Coordinator and I decided that I would begin coming to the Center the third week of school. When I arrived, however, none of the teachers were interested in learning to integrate the technology. They were too busy learning how to cope with eighth graders. I must have heard "why do they poke at each other" at least eight times a day. My reply always was "they are eighth graders." I would then get the usual rolling of the eyes and the look of "what have I got myself into." I came to find out that only three of the 16 teachers had ever worked with middle schoolers. Moreover, this teaching experience involved working with the same group for 6 1/2 hours a day, all day. It was quite an eye opener to those who never had the experience of teaching a group of 13-and 14-year-olds.

As the first six-weeks progressed, the "curriculum" was disintegrating for many of the modules. The curriculum had never been field-tested so this initial implementation had problems that needed to be solved. The simulation of an office environment was just not working. The interns were not interested in working independently or sitting for an hour or more for a "business meeting." They needed activity and some of the modules had not planned for that. The facilitators for one module scrapped two years' worth of planning and went back to the traditional method of reading a book and answering the questions at the end of the chapter. Their problem-based learning reverted back to direct

instruction. The teachers wanted the students to experience real-life work through the problem-based learning but the students had never encountered real-life work and were unfamiliar with much of the vocabulary and concepts embedded in the hands-on experiences.

On the first day I observed at the Center I met with the faculty as a whole after school. I told them who I was and that I was there to help them with the technology that they had in their individual modules. The key here was "help them," not do for them. I thought that I had made this point clear to the faculty, but I received many "do for them" requests and few "help them" requests. Other teachers had minimal requests, which did not involve much participation from them or me. They were too concerned with the everyday running of their classroom. When it came to technology, they were satisfied if the students simply used Microsoft Word and PowerPoint™.

Out of all those who made requests, one teacher stood out. She truly wanted to incorporate some of the technology training that had been provided by the county in her classroom. Teresa wanted to make changes in her teaching by capitalizing on the technology. She had a room full of technology such as a scanner, digital camera, video conferencing software, and 15 Internet connections. She wanted to use these resources, but she knew she could not do it alone. She wanted someone who would help her and someone with whom she could brainstorm. She was just who I was looking for--someone who wanted to go beyond the minimum use of the technology and to have the students use the technology in a way that was going to benefit them in the future. I also need to say that Teresa had an advantage over some of the other teachers at the center. She had spent the past 11 years teaching eighth graders and had planned her curriculum accordingly. From talking with others, the Instructional Technology Coordinator and her fellow teachers, I learned that Teresa had a history of being the type of person who wanted to learn more, wanted to be a better teacher, and constantly strived to be a better teacher.

I also learned that Teresa had previously worked in the middle school where she worked with a team of three other teachers. These teachers worked closely with each other and met daily to talk about students, planning, sharing philosophies, and instructional and personal wants and needs. At the new technology center, however, life

was different. There was no time to converse with other teachers. Teresa missed this time to talk, share, and reflect. Because of this lack of socialization and collaboration, Teresa was excited about having someone to share things with on an academic level. She had so many interests; most important was her desire to use technology productively in her classroom. Her initial request to me was open and inviting. She just wanted someone to come in and to show her anything that she could use in her classroom.

A week later the Instructional Technology Coordinator and I met and discussed some of the technology goals that she had envisioned for the Center. One of the main goals was to have students leave with an electronic portfolio of their work that had been done during the students' stay at the Center. These electronic portfolios could be something that the students could use to showcase what they had done at the center and to share with their parents, relatives, and maybe future employers.

Consequently, I went back to the Center and asked Teresa if she would be willing to do electronic portfolios in her classroom. She was overjoyed. She had finally connected with someone with whom she could collaborate, and on a challenge that she knew she could not do alone. We agreed to meet weekly or biweekly to discus developing portfolios.

So began what is the present dissertation study--a case study describing the reflective collaboration between a teacher and a researcher in the process of implementing electronic portfolios in a classroom. The resulting narrative also includes how Teresa went about helping the students develop their electronic portfolios, especially how she focused on engaging the students with written reflections of their own work.

This study described herein took place over a 15-week period (see Appendix A for Calendar). The following two research questions guided this 15-week investigation:

- How can reflection/collaboration be used between a public school teacher and a researcher in implementing electronic portfolios in a classroom?
- What steps are involved in implementing electronic portfolios in a classroom?

This study took place over three phases. Across these phases our respective roles switched as I began the implementation process in Phase One, with Teresa being an observer. As we progressed through the second phase of the study, Teresa gradually became familiar with teaching students about portfolios, reflection and the technology, so

that in the third phase of the study, Teresa took over the implementation process and I observed her.

This document is organized in the following manner: Chapter One is an introduction to the study; Chapter Two is a review of the literature that helped the researcher guide the research process; Chapter Three is the methodology which describes a case study approach; Chapter Four is the discussion, reflections, and recommendations, on two major issues that came to the forefront; Chapter Five is the realities of the study. The dissertation ends with the references and appendices, which include a chronology of the events that took place over the 15-week period; organizational charts and handouts that Teresa and I used during the implementation process; and an epilogue from Teresa showing how she was using electronic portfolios a year after the study concluded.

Chapter Two

Literature Review

The purpose of this literature review was to provide a scholarly context for the this research. The review begins with a look at innovation: what it is, and the process by which an innovation is diffused. The second component of this literature review is to review the literature on reflection; how it is has been defined and how it has been used. A review of portfolios is included next: the types, their components, the process by which a portfolio is developed, and the advantages and disadvantages of portfolios as it pertains to this study. The chapter concludes with a synthesis of topics used to develop the research questions.

Innovation

As with any new endeavor one has to think and reflect on what is to be accomplished and how this accomplishment is going to come to fruition. This literature review sheds light on the nature of innovations, how they are diffused, and why they are accepted or rejected. In the literature on educational innovation this roadmap is referred to as steps, stages, plan, and/or adoption for innovation (Ely, 1990; Fullan, 1991; Hall & Loucks, 1979; Havelock, 1973; Marris, 1975; Rogers, 1995). Fullan (1991) states that "the more factors supporting implementation, the more change in practice will be accomplished" (p. 67). Ghaith and Yaghi (1997) state, "Teachers' willingness to implement new instructional practices is a key factor influencing educational improvement" (p. 451).

Ely's (1990) research lists eight conditions that must exist for an innovation to be successful. These are:

1. dissatisfaction with the status quo
2. existence of knowledge and skills
3. availability of resources
4. availability of time
5. existence of rewards or incentives
6. expectation and encouragement of participation
7. commitment by those who are involved, and
8. evidence of leadership.

Fullan (1991) has done extensive research on the idea of educational change and innovation. He believes that "innovation is multidimensional" (p. 37). He lists three factors involved in innovation. These are:

1. the possible use of new or revised *materials*

2. the possible use of new *teaching strategies*, and

3. the possible alteration of *beliefs* (p. 37).

According to Fullan (1991) all or none of these factors may be implemented. New materials may be used without altering the teaching approach or change the beliefs underlying the change. This type of implementation without changes in all three, Fullan argues, only takes place when there is change in all three. Furthermore, Fullan agrees with Marris (1975) that unless shared meaning is developed in relation to all three factors the innovation will not succeed. Marris (1975) believes that people must attach personal meaning to their experiences regardless of how meaningful they might be to others. "Any innovation cannot be assimilated unless its meaning is shared" (p. 121).

Factors involved in the process of implementation of an innovation should help practitioners and planners "make sense of planning, implementation strategies, and monitoring" (Fullan, 1991, p. 47). Fullan presents a simplified overview of the change process by the following figure:

| Initiation | ⟷ | Implementation | ⟷ | Continuation |
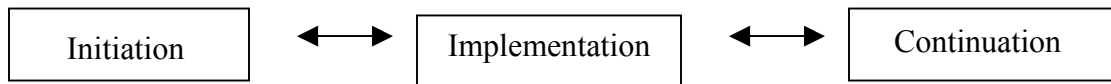
Figure 1. Simplified overview of the change process

In this overview, an idea is initiated, the ideas is accepted or rejected, if accepted one goes forward with the implementation, reviews the process, and accepts or rejects or modifies the process, and continues with the implementation once the changes are made. There are numerous factors at each phase and as the two-way arrows imply adopting an innovation is not a linear process but one that goes back and forth between phases as decisions made in each phase are either accepted or disregarded (Fullan, 1991).

Teachers must be advocates for the innovation and Fullan (1991) feels:

That teachers are willing to adopt change at the individual classroom level and will do so under the right conditions (e.g., an innovation that is clear and practical, a supportive district administration and principal, opportunity to interact with other teachers, and outside resource help) (p. 55-56).

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When planning, in the initiation phase, for adoption of an innovation Fullan (1991) believes the following should be taken considered: 1.) relevance, 2.) readiness, 3.) and resources. Innovators should ask themselves the following questions: Is there a need for the innovation? Is there a clear understanding of the innovation? Does the school have the capacity to initiate, develop, or adopt a given innovation? Is there a need for the innovation? Are facilities, equipment, materials, and supplies available? Is there accumulation and a provision of support for the innovation?

Fullan (1991) considers collegiality to be essential to make change work with or among teachers. The degree of change is strongly related to the extent to which teachers interact with each other and others providing technical help. Teachers need to participate in one-to-one and group opportunities to receive and give help and more simply to converse about the meaning of change. Because of this reflection teachers are in a better position to know whether they should accept, modify, or reject the change.

To be successful as innovators Fullan (1991) sees teachers as professional educators; ones that "simultaneously and seamlessly become inquiry-oriented, skilled, reflective, and collaborative professionals" (p. 326). Saye (1998) says that research stresses the "importance of involving teachers in defining needs and planning implementation" (p. 211). Edwyn, Eijkelhof, Gaskell, Olson, Raizen and Sáez (1997) conclude that "the teacher has to be seen as critically important within any innovation. They must, however, have grounds for confidence in the changes being sought, which implies some sense of shared ownership" (p. 482). Pierce and Hunsaker (1996) when researching sustaining change believed that "a necessary component to creating long-term, effective school changes is to establish a common vision in which the teachers have a vested interest in supporting" (p. 102). They further state, "teachers are more committed to changes that they have had a hand in designing" (p. 102).

Hall and Loucks (1979) research on adoption of an innovation focused on stages of concerns or their perceptions, feelings, and motivations as they experience an innovation. The stages are:

1. Awareness – where the innovator shows little concern or involvement
2. Informational – an interest develops in learning more detail about the innovation

3. Personal – uncertainty about the demands of the innovation is the concern at this level

4. Management – attention is focused on the processes and tasks of using the innovation and the best use of information and resources

5. Consequence – attention focuses on impact of the innovation on students in his/her immediate sphere of influence

6. Collaboration – the focus is on coordination with others regarding uses of the innovation

7. Refocusing – exploring of more universal benefits including the possibility of major changes or replacement with a more powerful alternative.

Havelock (1973) in his research sees innovation as a process where the educators are the "change agents." He defines change as "any significant alteration in the status quo, which means an alteration which is intended to benefit the people involved" (p. 4). He defines innovation as "any change which represents something new to the people being changed and benefits them" (p. 4). Havelock chose the term "stages" for his framework because he found that most change agents think about their innovation in terms of a specific project which have a defined beginning and an end, and a sequential history. The framework begins with how things are now in education and after the six stages are followed the change agent gets to what education should be in the future. The six stages are building a relationship, diagnosing the problem, acquiring relevant resources, choosing the solution, gaining acceptance and the final stage stabilizing the innovation and generating self-renewal. Through these six stages a relationship must be developed where a secure and helping role is started, where the change agent can identify the needs of the client, and where these needs can be articulated. Once the needs are articulated, resources must be obtained that will help the client derive implications, generate a range of alternatives, and settle upon a potential solution. The solution may need adaptation and reshaped. This can be done through describing, discussing and demonstrating which leads to awareness, interest, evaluation, and finally adoption of the innovation. In the final stage the change helps the client become self-sufficient and become his or her own change agents.

Rogers (1993) defines innovation as "an idea, practice, or object that is perceived as new" (p. 11) where Rogers (1995) believes that communication is at the heart of the adoption process. Rogers includes five factors that must be taken into account when adopting an innovation. These are relative advantage, observability, trialability, complexity, and compatibility. When thinking about relative advantage ideas to think about are: Is this innovation going to make a significant difference in the way a teacher teaches or a student learns? Is what the teacher is already doing the best way to get the job done?

Observability means to see the innovation in action. Compatibility relates to the first factor in that, does the innovation fit with the teacher's objectives and goals. Complexity refers to the innovator being able to explain what the innovation is and how it works in the classroom. Trainability relates to the second factor but takes it step beyond by asking can the innovation be tried out but what if only part of the innovation is used, will it work or can the innovation be implemented a step at a time?

The Rand study conducted back in the seventies was one of the most important studies done regarding educational change. Conclusions by Berman and McLaughlin (1978) on factors affecting implementation and continuation include:

1. Teachers must clearly understand their project's goals and percepts: such clarity comes during implementation. We doubt whether projects aimed at significant change can be effectively implemented across a whole school system at once.

2. Effective implementation strategies provided each teacher with necessary and timely feedback, allow project-level choices and encourage commitment to the project. These strategies were effective particularly when applied in concert with concrete, teacher-specific, and extended training. Classroom assistance from project or district staff, regular project meetings that focused on practical problems, teacher participation in project decisions, and local materials development.

3. Our observation and interview data leave little doubt as to the importance of constant and active support from LEA officials and specialized staff for the project's short-run outcomes and especially its long-run fate (p. vi-ix).

The literature review thus far has concentrated on looking at innovation strategies in general. The next portion will look at innovation strategies as they relate to teachers adopting the use of technology in the classroom.

Lowry's (1995) research can be used as suggestions for supporting and encouraging teachers in the adoption of technology in the classroom. The steps are:

Step 1: Recognize that the use of technology as an innovation.

Step 2: Promote initial and ongoing communication about the technology. Teachers must get initial information from colleagues, school administration, the grapevine, conferences, professional literature, and the mass media. Teachers must be included in the process of adopting technology by helping them, asking their advice, and answering their questions.

Step 3: Help teachers assess their readiness for the technology. Teachers must be ready to accept technology into their classroom.

Step 4: Encourage teachers to assess their students' readiness for the technology. This readiness refers to whether or not the students can function successfully with it.

Step 5: Help teachers prepare for the long haul. Adopting an innovation takes time in a process that makes sense to the innovator (p. 10-12).

In conclusion, this section of the literature review looked at how different researchers view the adoption of an innovation. They all described the following common threads: teachers must have an active part in the decision-making regarding the innovation which allows for commitment, there must be communication between all parties involved, and the resources must be available to implement the innovation. These resources include time for conversations among the stakeholders, support from inside and outside the school, and equipment.

Reflection

Reflection is a term, and a process that could be defined by anyone who might be called upon to do so. The answers would probably be wide and varied, yet, everyone would feel comfortable in their own understanding of what this thought process means to them as an individual.

Boud, Keog, and Walker (1985) state: "Reflection in the context of learning is a *generic* term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations" (p. 19). It is this *generic* conceptualization of reflection that education must refine in order to transform an often haphazardly applied practice into a more efficient and potentially beneficial education technique.

Already, we begin to grasp the meaning of the statement made by Clift, Houston, and Pugach (1990),

> There is no single appropriate definition of reflective practice and no single set of strategies that best exemplifies it ... reflective practice is as much a state of mind as it is a set of activities. This means that reflective practice must be internalized by those who are to practice it, and they must believe in its worth and utility for making things better (p. ix-x).

The myriad of reflective theories that abound only serve to further confound the matter. Clift et al., (1990) also state: "Reflective practice is now much like an underdeveloped land: its potential for growth will be determined by the diligence, rigor, and wisdom that comes from within the teacher." (p. xi).

Having not arrived at a concrete definition, perhaps it might serve best to explore how others look at reflective practice.

We know that from the earliest caveman drawings to time capsules sent into outer space, humans have always had the desire to record their history. Writing has always been used in human history to record events of all kinds, but we also find more personal uses of writing in which individuals recorded their insights into life. The most ancient document of this kind is the *Meditations* of Marcus Aurelius from the second century (Walker, 1985).

Holly (1989) states:

Personal documents or, as some people describe them, private chronicles are as old as written language. History is in many ways a journal--someone's impressions, thoughts, ideas, and not as obviously, his or her interpretations of events. There are many types of personal documents: letters, picture, film, logs,

diaries, and journals. Books, both historical and literary, are often reconstructed accounts from such documents (p. 20).

Boud, Keog, and Walker (1985) state that the most influential researcher into the field of reflective activity was John Dewey. Dewey (1933) believed that reflective thinking involved two limits: "A state of doubt, hesitation, perplexity, mental difficulty in which thinking originates" (p. 12) and then moves into "an act of searching, hunting, inquiring, to find material that will resolve the doubt, settle and dispose of the perplexity" (p. 12).

In between these two limits (Dewey, 1933) are states of thinking. The first being the suggestion phase where we think of ways to get us out of the situation that we are in. Intellectualization is the next phase where the conversation takes place in assessing the problem to be resolved, assessing the suggestions, and how the best way to use the suggestions to resolve the problem. During this phase we get a better idea of the problem and the kind of solution needed. The third phase leads to the hypothesis or guiding idea that leads to more facts which test the suggestion. Reasoning, the fourth phase, helps extend the knowledge known about the problem but it also depends on what is already known, thus, leading the mind to link intervening terms to a consistent whole. Finally, the testing of the hypothesis leads us to verification or rejection of the solution.

Dewey (1933), wants the reader to understand that if the solution is rejected that it still has been a learning experience because as he says, "nothing shows the trained thinker better than the use he makes of his errors and his mistakes" (p. 114).

Also the five phases do not always come in the above order. Each step leads to new knowledge and this new knowledge helps to make decisions about the course to take in solving the problem, thus stepping back and forth in the phases.

Reflection-in-action is how Schön (1983) describes the way skilled professionals think as they act. They have a sense, built up through experience, of why they are acting as they are at a particular moment. Conversely, reflection-on-action is a between events phenomenon. The practitioner reflects on previous actions taken and on possible actions to come.

A model Schön (1987) uses when speaking of reflection-on-action is the model of joint experimentation where the coach joins the student in the experiment of practice,

testing and assessing. The coach helps the student formulate the qualities he or she wants to achieve, then by demonstration or through description, they explore different ways of achieving a desired objective. "The coach works at creating and sustaining a process of collaborative inquiry and puts his superior knowledge to work by generating a variety of solutions to the problem, leaving the student free to choose and produce new possibilities for action" (p. 296). It must be emphasized here that Schön's reflective coaching is both a benefit for the coach as well as the learner where success is measured by what both parties take away from these reflective sessions.

Using Schön's model one can look at Garmston's (1985) work on challenge coaching. Challenge coaching helps develop solutions to persistent instructional problems within a group. This group may consist not only of teachers, but, the group may be made up aides, librarians or administrators for their special perceptions, expertise or potential role in a solution. The group develops, conducts and tests solution approaches. The major premise of this type of coaching is "problem-solving efforts by those responsible for carrying out instruction can produce insightful, practical improvements in instructional design and delivery" (p. 25).

Schön's (1987) model can be referred to as reflective practice, which is a challenging, demanding process best undertaken in collaboration with another practitioner. It is viewed as a means by which practitioners, according to Osterman and Kottkamp (1993) "can develop a greater level of self-awareness about the nature and impact of their performance, and awareness that creates opportunities for professional growth and development" (p. 19). It is a time when practitioners do not need to feel alone where the dialog is expanded and they can get more information and different perspectives without judgment.

Another model of reflective practice can be seen in the work of Kemmis (1987) who developed a staff development model where teachers could reflect on their teaching practices with support from university consultants. His suggestions included the following: 1) if you plan to initiate research participate in the research yourself, 2) start small -- don't try to work with an entire school faculty or even grade level--look for the enthusiasts, 3) set a realistic period which allows for the collection of data, reflection, and reporting, 4) arrange supportive work-in-progress discussions, and 5) work to involve all

who are participating in the research to share responsibility for the whole research process.

All of the above models show reflective practice in one form or another, most often with another person who can share in the shaping of the goals and procedures to overcome a problem and reflect together on shaping a solution or solutions to a problem. This paper started out with a discussion of what reflection is then showed how this reflection could be shared with others in developing a reflective practice to make changes in practice or even with a problem.

Portfolios

This portion of the literature review looks at portfolios. The different types of portfolios, their parts, the developmental process, the management process of the portfolio, advantages of the use of portfolios, and the disadvantages and challenges of using portfolios in the classroom.

Types. Although the use of portfolios for myriad purposes has been common practice for many years, Linda Polin has noted in Danielson and Abrutyn (1997) that as recently as the early 1990s the use of portfolios was largely rhetoric. She adds that since that time the use of portfolios have "burst onto the scene in a wide range of roles" (p. v).

It appears that the sudden popularity of portfolios has attracted a plethora of researchers and practitioners. It is quite understandable that the same people who often practice in isolation arrive at varying terminology for similar purposes and processes. For example, working portfolios, cross-discipline portfolios, and process portfolios all seem to be similar in that they serve as warehouses for students' work, although for different purposes.

The purpose for working portfolios is to serve as a holding tank for artifacts that may be selected for a more permanent portfolio (Danielson & Abrutyn, 1997). Cross-discipline portfolios (Seidel, Walters, Kirby, Olff, Powell, Scripp, & Veenema, 1997) are collections of work from subject areas, which are created over the course of a term, or perhaps, the year. They are especially effective at capturing developmental changes and showing children's interests or questions. The purpose of the process portfolio is to document the learning process a student engages in through various projects throughout the instruction year (Seely, 1994).

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From the above types of categories comes the display, showcase or best works portfolio. Danielson and Abrutyn (1997) describe the function of this type of portfolio by saying that this type of portfolios is probably the most rewarding use of student portfolios. It displays the students' best work, the work that makes them proud. "Students become most committed to the process when they experience the joy of exhibiting their best work and interpreting its meaning" (p. 3).

As the terms documentation, evaluation, graduation, and assessment imply, there are similarities among the following four types of portfolios, as well.

The documentation portfolio (Seely, 1994) entails observing and recording progress in the learning process. These portfolios are used to show student growth over a specified time for report cards and parent conference purposes. Seely describes the evaluation portfolio as an opportunity to evaluate students on preselected tasks using predetermined criteria. Graduation portfolios (Seidel et al., 1997) demonstrate the levels of mastery and creativity achieved by students during their school years, but they reflect much less of the educational process. High school seniors might use these portfolios for application to college, jobs, or other transitions. The assessment portfolios (Danielson & Abrutyn, 1997) serve primarily to document what a student has learned. "The content of the curriculum, then, will determine what students select for their portfolios. Their reflective comments will focus on the extent to which they believe the portfolio entries demonstrate their mastery of the curriculum objective" (p. 4).

Another type of portfolio is the electronic portfolio, which differs from its paper cousin primarily in that the portfolio materials are created in a digitized form (Hawisher & Selfe, 1997). An electronic compilation of works could be a working, display, assessment, cross-discipline, graduation, showcase, documentation, or evaluation portfolio; any type as previously defined. A significant difference is that electronic portfolios have the potential to entail many characteristics which pencil and paper portfolios do not. Electronic portfolios can store artifacts compactly, and they accommodate a variety of media such as student readings, music, videos of presentations and performances, 3-dimensional objects such as dioramas and models, ultimately creating multimedia portfolios (Farmer, 1997). In addition, Farmer believes "that the electronic portfolio can be made easily accessible to a number of audiences; work can be

duplicated to facilitate multiple assessments, it offers flexibility of arrangement and selection; and it fosters student ownership of personal effort" (p. 30).

When using electronic portfolios, McKinney's (1998) students expressed that the nonlinear attributes of electronic portfolios allowed them to show connections. They also felt that with the use of electronic portfolios they were on the "cutting edge" because "they would have electronic portfolios to use for interviewing and they had a greater understanding of how to help children in their future classrooms develop multimedia portfolios and projects" (p. 94).

Obviously, many types of portfolios exist. Whether a teacher chooses to use an electronic, or a more traditional paper format it should be understood that the similarities which exists are paramount. The various styles can be customized for student participation in a process that will allow the student to display their works in a more thorough fashion thereby making the requirement of documentation and evaluation more concrete for the teacher. Teachers will be able to collect samples of the student's work from multiple disciplines and showcase the portfolios for any stakeholder who desires, or needs, to review the portfolio.

Portfolio components. The parts of a portfolio are organized in a routine manner not unlike any book one would choose to take from a library shelf. A title, a table of contents, an introduction and the artifacts are common elements found in most portfolios. It is important to note, however, that portfolios entail ample opportunity for student reflection in the construction and organization of the portfolio.

The introduction provides an overview for the portfolios where the student must reflect on and critique an entire body of work. This introduction provides a rich opportunity for reflection where different pieces of the portfolio are compared and contrasted, patterns are recognized and the meaning of the whole collection is interpreted. Danielson and Abrutyn (1997) state: "Such an opportunity for meaningful synthesis is rare in school. Students will become more skilled as they have more chances to do such work" (p. 17).

Although the opportunity for student reflection might come at varying locations in the portfolio it is a quintessential part of the whole. Seidel et al. (1997) note: "A review section that includes student reflections and self-assessments, together with teacher

comments and peer comments can help provide important information about the expectations, standards and critical atmosphere in which the various projects were produced" (p. 33).

Another notes that portfolios should provide opportunity for reflection and that actual pieces or documents, should each be accompanied by an explanation of the assignment and a reflection sheet (Worcester, 1998).

Thus, it can be stated that although the organizational format of portfolios might differ slightly from classroom to classroom, teacher to teacher, or even, student to student, two things are apparent. One, there needs to be an organizational scheme so as to aid all stakeholders who wish to review the portfolio, and two, ample provision needs to be made for student reflection. For, as previously stated by Danielson and Abrutyn (1997) such opportunities for meaningful synthesis is rare in school. The opportunity for a student to collect their own work over an extended period of time, then weave it into a creation of personal style and taste does, indeed, seem to present a very meaningful opportunity for student self-evaluation and growth.

Developmental process. As is true with the organization and various parts of a portfolio, there seems to be no one golden rule for the developmental process. However, there are common threads which appear in the literature. The following five steps seem sufficient to cover the span of the developmental process from beginning to end, as well as, appear most frequently in the literature reviewed. The steps are: projection of purposes, collection, selection, reflection, and presentation.

Researchers (Danielson & Abrutyn, 1997; Melograno, 1996; Seidel, et. al., 1997) all agree there needs to be a reason for the development of the portfolio and the collection of the artifacts is based solely on the purpose and the instructional objectives to be addressed. Purposes may include: keeping track of student's progress; providing students with an opportunity to assess their own accomplishments; assisting the teacher in instructional planning; serving as a basis for program evaluation. Thus, it can be seen that mindful attention to the purpose of the portfolio must take place at the very outset of the developmental process.

The collection phase follows projections on the purpose of the portfolio. Again, purposeful attention should be given to this aspect of the process. For teachers using

portfolios for the first time, the collection step requires planning because students produce a large number of papers. Students themselves will need an orientation to the portfolio development process along with learning to see the value in collecting their work.

So, what is to be collected? Black (1996) states: "Anything should be included: classroom assignments, finished or rough drafts, work students develop specifically for the portfolio to show their interests and abilities, self-reflections, and observations and comments by teachers or parents" (p. 52).

But others (Melograno, 1996; Seidel et al., 1997) use the words collecting and selecting synonymously. Webster's defines collecting as "bringing together into one body or place" (p. 259) and selecting as "judicious or restrictive in choice" (p. 1064). From this definition I will use the word selecting for the collection of the students' most meaningful and treasured artifacts.

When the student is ready for the selection process two compelling factors should be considered and these are the students' desires and the purpose for collecting each item (Melograno, 1996). Portfolio artifacts can be selected jointly by the students and teachers. The advantage of the joint approach is that it gives the students a sense of ownership while allowing the teacher to maintain some control over the contents (Seidel et al., 1997). Items that could be selected may include pre-instruction inventory, journals, student reflections, projects independent study contracts, videotapes, peer reviews, parental observations, and logs from experiments or long term projects.

Melograno (1996) notes that item selection should be based on a certain criteria whether they be formal or informal. This criteria could be that the artifact is something that makes the student feel really good, and/or something that the student sees as a work in progress with written plans for revision, or a best or most representative work, or samples organized chronologically according to a theme.

On a more formal note this criteria could be that the portfolio selection is based on the learning objectives of the curriculum. Melograno (1996) states:

> The more precisely the learning objectives are stated and the clearer the
> guidelines for evaluating student work, the more focused the criteria for portfolio
> selection can be. At the point the teacher may work to incorporate the selection

process into instruction, during which students alternate between collecting, selecting, and revising until they have assembled an acceptable number of satisfactory pieces (p. 14).

McKinney's (1998) research with preservice teachers indicates that when her students were asked about selecting artifacts for their portfolios, they felt, "that people viewing their portfolios might not have the patience or desire to see large quantities of text and multiple examples" (p. 93).

Obviously, collection requires reflection, and it would seem that selection would require an even more deliberate measure of reflection. Even though reflection might not be a distinct step in the developmental process of all the literature reviewed, reflection is an integral dynamic in this same literature. Grady (1992) says: "When students can ruminate about their work they are taking charge of their learning and becoming aware of what and how they learn. This awareness, or metacognition, helps students move from passive to active learning" (p. 24).

Reflection can be seen as a distinct stage in which students articulate their thinking about each piece in their portfolio. Teachers must teach students to reflect and identify the characteristics of high-quality work and recognizing it in their own and others' efforts (Danielson & Abrutyn, 1997).

Display, showcasing, or presentation are all terms associated with the manner in which the student's portfolio will be made public to an audience who is yet another consideration in the developmental process. Seidel, et. al. (1997) state:

Presentational issues are important to both the reader and to the student. The portfolios are not only a collection of the student's work, they are also reflections of the student's efforts and intentions. Simultaneously, the portfolios reflect the concerns of the teacher, and the resources that are available. Keep in mind the issue of display. These issues could range from where to store the portfolio to providing appropriate background material to make the portfolios readable by someone less familiar with the classroom. Still other issues may be aesthetic: Does the portfolio capture the true effort or intention of the student (p. 40)?

Certainly, teachers should bear in mind that mere collection alone will be void of purpose, and that collection without selection is bound to limit the opportunity for

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reflection. Then, even though the final portfolio has been assembled, the job is not over. The teacher should insure that all portfolios receive due attention, strategical and aesthetic arrangement, and ample opportunity for presentation in the highest and best possible setting. Students deserve the greatest degree of appropriate positive reward for a job well done.

Management of the portfolio. Perhaps it is a fair to state that managing all of the various developmental processes as discussed in the previous section would be, at best, difficult for one student but, the more students in the classroom, the more challenging the task becomes. Therefore, it would appear reasonable for teachers to develop managerial strategies germane to their individual demands.

Glazer, Rooman, and Luberto (1996) suggest guidelines that could benefit all teachers. These include:

1. Choose a convenient central location for the portfolios.
2. Select containers that work best for you.
3. Model portfolio instructions.
4. Schedule regular conferences with each student. When conferencing, have students spread out all materials so that they can see their progress.
5. Require each student to justify in writing the choices he or she has made.
6. Use Post-it notes for teacher observations and insights into the individual student (p. 80).

In conclusion, portfolios represent a huge undertaking for the teacher and the student, and a major change in the current practice for most classrooms. Danielson and Abrutyn (1997) caution teachers not to implement this change all at once. They suggest to start small, select a single class or subject and begin working with portfolios in that one setting. In this way the teacher can experiment with different approaches to the purpose, collection and selection of artifacts, the reflection, and presentation of the portfolios, as well as, experimenting with the development and management challenges while making adjustments along the way without confusing large numbers of students.

It might also be stated that by starting small the "confusion" the teacher is likely to encounter will be minimized, as well.

Advantages of the use of portfolios in the classroom. Portfolios have great value for the student. Because the collection of artifacts should be driven mainly by the student; it is bottom-up, reflective, intrinsic and meaningful, thus, self-motivational. Engel (1996) states: "Portfolios allow children to express themselves. Even if students are told what artifacts that are to be used, in the reflection portion the students can tell why they did the artifact as they did" (p. 25).

Portfolios also allow for individualization; the brightest and best students will still be allowed to express themselves fully, but portfolios will allow the more reserved students to come to the front of the class, as well. Engel (1996) notes:

> Many children are inexpressive in schools, portfolios allow them to be expressive. Characteristics and habits of mind, although not always acquired in school, can, nonetheless, be sustained there. Curiosity, confidence, and imagination must be recognized, valued, and given opportunity for expression. These are the sources of energy, not only for school learning, but for lifelong learning. . . . Portfolios can capture and reveal significant aspects of personal meaning. When reviewing portfolios with children, teachers find that they are indeed using 'new instruments and looking in new places'. The new instruments are the portfolios themselves. The new places are the products of the active, creative, energetic, imaginative, constructive, and meaning-making minds of children (p. 25).

Portfolios also have the advantage of maintaining a students' work for an extended period of time. This is a significant dynamic, which deserves emphasis. Without a systematic scheme for retaining students' work it can be rightfully assumed that once papers and assignments are returned to students this same work often fails to make its way out of the classroom. Instead, the work might be deposited in the trash, or even just left strewn about the classroom. Essential learning opportunities are wasted with this type of practice. Wolf (1996) states:

> The use of portfolios engages students in constructing a story--a long-term account--of what and how they learn. As they page through their collections in April or June, they are struck by what they have learned. But that in itself is a

story. With time, experience, and conversation, students' ability to read their own portfolios with depth and understanding also develops. Early on, students appraise their own work using only standard and flat-footed criteria: neatness, length, or the grade written at the top. As little as six months later, they notice and care about a widened range of characteristics. Their judgment is variegated; they know a piece of work can open with fireworks and fizzle in closing (p. 108).

Further, portfolios may: 1) represent a wide rage of student work in a given content area, 2) engage students in self-assessment and goal setting, 3) allow for student differences, 4) foster collaborative assessment, 5) focus on improvement, effort, and achievement, 6) link assessment and teaching to learning 7) focus on actual pieces of student work, not approximations supplied by a score on a standardized test, and, 8) present a learning history (Grady, 1996, Melograno 1996).

Danielson and Abrutyn (1997) believe that four areas come to the forefront when looking at the advantages of portfolios, these are clarity of expectations, student involvement, and the elements of the instructional process can become intertwined.

In selecting artifacts for a portfolio students must be able to recognize the components that went into the piece of work and be able to articulate the reasons a certain piece of work is better than another. Therefore, the teacher must provide clear expectations and standards. This will probably be new for students as well as teachers. In addition, knowing the expectations the analysis or reflection of the piece will almost certainly include more than neatness and correct spelling and correct answers.

By involving students in the portfolio process, students participate actively in assessing their own work and monitoring their progress toward instructional goals.

In a portfolio classroom the elements of the instructional process are intertwined. Curriculum outcomes are established with clear expectations where both instruction and assessment are oriented toward the types of activities where students can develop and demonstrate, through reflection, their understanding of the skills and knowledge represented by the curriculum. The process is highly iterative, with teacher and student moving forward and backward between instruction and assessment.

Disadvantages and challenges of the use of portfolios in the classroom. The management portion of this review alluded to the disadvantages a teacher might

encounter should they, either, presently use portfolios, or decide to employ them in the future. Perhaps as expected transition to a different educational practice and the apparent burden presented by time constraints are real issues to be considered. Other issues such as individualized grading can also be problematic. True assembly line education is convenient and time effective, but is it best? The scales of advantages versus disadvantages should always be tipped in favor of the students' achievement. Black (1996) supports this by stating:

> Time and grades are among the other concerns. Managing portfolios takes time. But, teachers who change from traditional assessment to portfolio assessment are more likely to manage their time without frustration if they change teaching styles at the same time. Grades are another sticky issue. How can teachers assign grades when they're assessing students' portfolios for effort, progress, and insight? High school students and their parents might object to portfolio assessment on the grounds that college admissions offices require grades and class rankings (p. 54).

> Granting college rankings, transition issues, logistics, and other concerns their fair measure, the availability of time appears to stand alone as the most often cited disadvantage for the use of portfolios in the classroom. Glazer, et. al. (1996) state: "A major concern was the amount of time and effort required to implement the use of portfolios in the daily classroom" (p. 78).

> Melograno (1996), when looking at the use of portfolios, adds "teachers may say, 'I have too many students and not enough time.' The reality for most teachers is to manage students first and deliver some kind of instruction second" (p. 154).

> Danielson and Abrutyn (1997) classify time, perhaps the most often cited disadvantage, as nothing more than a challenge. They state:

> Many educators think that their days are already full and they cannot possibly add another major initiative to their work with students. Practitioners most apprehensive about the time demands of portfolios tend to regard the processes of instruction, testing, and portfolio development as three discrete tasks. They point out that they are already pressed for sufficient time to cover all the content of the curriculum and doubt that they could add another element to the instructional process (p. 43).

It should be added that electronic portfolios need special consideration when considering the challenges versus the benefits of their use. As previously mentioned any of the types of portfolios described in this review can take the format of, either, a pencil and paper portfolio, or an electronic portfolio. Therefore, is the troubling time variable exacerbated, or aided by the use of electronic portfolios? Many managerial dynamics share in the answer to this question as does resources, experience, and the perspective of the classroom teacher. Hawisher and Selfe (1997) state: "The new technologies never stand still. They are constantly changing and as such require continuous learning on the part of teachers and students" (p. 312). Continuous learning is most definitely a time commitment.

Another challenge for the implementation of computers would be with the fact that technology is not evenly distributed across schools or even within given educational settings. This unevenness contributes to the creating among us those with easy access to innovative developments and those for whom access is difficult and sometimes nonexistent (Hawisher & Selfe, 1997).

Proderick (1998) continues in this vein by stating that other challenges in developing electronic portfolios are:

1. the limitations of software, hardware and staff training; and,

2. the biggest barrier to electronic portfolios is the lack of technical support for teachers. Support can help to alleviate the stress that will certainly come with change. The support needed will include advice on technology acquisition, technology maintenance and staff training. Ideally each school should have a technology specialist, but in schools today this is far from the case (p 4-5).

Considering the above variables electronic portfolios do seem to require special consideration. The crucial element of time would seem to be compounded by the continuous need for learning.

Conclusion. Diverse and flexible are two very good descriptors one might consider for portfolios. This is demonstrated by the broad range of types and purposes for creating a portfolio. There are, however, constants, as well. All portfolios are collections of artifacts, which have been collected with a particular purpose in mind, and have special meaning for the owner. The accumulation and selection of the most desired

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artifacts is geared at taking the owner on an inward journey into the self. Hopefully, such a journey will be reflective and allow the owner to control and discover much of their own path thereby enhancing motivation, understanding, and knowledge.

Assessment, display, working, process, graduation, electronic, and cross-discipline portfolios have all been discussed in this review. As stated previously similarities exist from one type of portfolio to another. Also, the broad range of nomenclature suggests that portfolios can be created for many different purposes; this also suggests that any classroom teacher should have the ability to customize portfolios for their own particular needs and purposes. This is a very attractive instructional feature.

The parts of a portfolio are somewhat standard; it has been noted that the parts of a portfolio are similar to any book one might choose to examine. Generally, portfolios include: a title page, a table of contents, an introduction, and the collected artifacts. A distinguishing feature of portfolios is that there should be ample opportunity for reflections throughout the portfolio. This is a purposeful tactic designed to enhance the meaning related to various artifacts and interweave this meaning into the owners' consciousness about themselves and their existence in their own particular environments and individual sets of life circumstances. Danielson and Abrutyn (1997) have stated that, "such an opportunity for meaningful synthesis is rare in school" (p. 17).

Again, various authors have used different terms to describe similar processes, however, the general consensus is that the developmental process includes:

a) Projection, or deciding on the portfolio's purpose. This is deemed to be a critical roadmap for the activity. It has also been stated that establishing the purpose does not always have to begin at the outset, and might evolve during the process.

b) Collection speaks for itself; it is, literally, the collection of the artifacts that are to be placed in the portfolio. Some authors have suggested that anything and everything can be a permissible artifact for collection while others have suggested that collections be focused about the purpose.

c) Selection is the process of elimination when the owner must decide which are the truly most treasured artifacts they would like to remain as part of the final

portfolio. The selection process should be designed so as to enhance reflection.

d) Reflection is part of the selection process, but it goes beyond that. Owners are required to reflect, most often in writing throughout the portfolio, on each and every artifact they have chosen to save.

e) Showcasing is also referred to as presentation, or display. This is the process of allowing all stakeholders the opportunity to view the portfolio. This process is emphasized as being a vital opportunity for the student to receive their due reward for their efforts. Further, it is a responsibility of the teacher to arrange times and settings that will allow the students the most advantageous circumstances possible.

The previously mentioned duties of the teacher regarding showcasing the portfolios are but part of the managerial responsibilities. Indeed, at first glance managerial duties seem overwhelming for the teacher, as noted, a portfolio classroom requires a unique perspective, an understanding of how things work best with such a methodology.

Lastly, to review the advantages and disadvantages of a portfolio classroom, a case has been made to dispute the concept of disadvantages. Foremost among the stumbling blocks has been the challenge to manage time so as to accommodate portfolios in addition to all other duties required of the classroom teacher. The remedy for this challenge has been stated to lie in the management of one's time and the understanding of the portfolio process which can be perceived as a time saver when viewed from the holistic standpoint.

If educators regard the instruction-assessment process as a single enterprise in terms of a cycle of teaching, formative assessment, and feedback, the use of portfolios does not subtract from teaching time. Instead, it becomes part of the time used for teaching, part of the instructional process. Moreover, because the practice tends to engage students in their own learning, the resulting increased motivation and commitment allows classroom time to be used far more productively than before portfolios were introduced. It is precisely this change in culture that characterizes the portfolio classroom.

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Research Questions

The information presented in this chapter has focused on innovation, reflective practice, and an overall look at portfolios. In summary I would like to point out several important topics in each area and how these points were used to support the development of the research questions.

Innovation. Ghaith and Yaghi (1997) state that, "Teachers' willingness to implement new instructional practices is a key factor influencing educational improvement" (p. 451). And, Marris (1975) adds, that people must attach personal meaning to their experiences regardless of how meaningful they might be to others. "Any innovation cannot be assimilated unless its meaning is shared" (p. 121). Fullan (1991) points out in his overview of change that there are numerous factors at each phase and that adopting an innovation is not a linear process but one that goes back and forth between phases as decisions made in each phase are either accepted or disregarded. Pierce and Hunsaker (1996) state that "teachers are more committed to changes that they have had a hand in designing" (p. 102). Havelock (1973) speaks of the six stages a relationship must be developed where a secure and helping role is started where the change agent can identify the needs of the client and where these needs can be articulated. Once the needs are articulated, resources must be obtained that will help the client derive implications, generate a range of alternatives, and settle upon a potential solution. The solution may need adaptation and reshaped. This can be done through describing, discussing and demonstrating which leads to awareness, interest, evaluation, and finally adoption of the innovation. In the final stage the change helps the client become self-sufficient and become his or her own change agents.

Berman and McLaughlin (1978) conclude that projects aimed at significant change cannot be implemented across a whole school system at once. They also believe that timely feedback must be given to the teacher. This feedback should be focused on practical problems, the teacher should have a say in any changes, and materials developed locally. In this study reflection was used to implement the innovation, electronic portfolios.

Reflection. Clift, Houston, and Pugach (1990) tell the reader that "reflective practice must be internalized by those who are to practice it, and they must believe in its

worth and utility for making things better" (p. ix-x). Dewey (1933) stated that reflective practice thinking moves from one limit where thinking originates into "an act of searching, hunting, inquiring, to find material that will resolve the doubt, settle and dispose of the perplexity" (p. 12). Dewey also writes of phases where in each phase decisions are made to solve problems and therefore is the stepping back and forth in the phases. In Schön's (1987) model of reflective practice he speaks of joint experimentation where the coach helps the student formulate the qualities he or she wants to achieve but "leaves the student free to choose new possibilities for action" (p. 296). Kemmis (1987) suggests the following: 1) if you plan to initiate research participate in the research yourself; 2) start small -- don't try to work with an entire school faculty or even grade level--look for the enthusiasts; 3) set a realistic period which allows for the collection of data, reflection, and reporting; 4) arrange supportive work-in-progress discussions; and 5) work to involve all who are participating in the research to share responsibility for the whole research process.

These ideas led me to the first research question:

- How can reflection/collaboration be used between a public school teacher and a researcher in implementing electronic portfolios in a classroom?

Portfolios. An ever increasing amount of literature that has been written regarding portfolios. The following points were used to guide this research. The most rewarding type of portfolios as stated by Danielson and Abrutyn (1997) is the showcase portfolio. "Students become most committed to the process when they experience the joy of exhibiting their best work and interpreting its meaning" (p. 3). This showcase portfolio can be done with paper or pencil or in a digitized format known as an electronic portfolio. Farmer (1997) believes, "that the electronic portfolio can be made easily accessible to a number of audiences; work can be duplicated to facilitate multiple assessments, it offer flexibility of arrangement and selection; and it fosters student ownership of personal effort" (p. 30).

Additionally, there was much information regarding the process of developing a portfolio (Black, 1996; Danielson & Abrutyn, 1997; Grady, 1992; Melograno, 1996; Siedel et al., 1997; Worcester, 1998,). The process included having a purpose, collection of the artifacts, selection from this collection of the best works to go into the portfolio,

reflecting on the artifacts, and presenting the portfolio. But, there was not much information regarding what went on these individual sections.

Many researchers (Black, 1996; Danielson & Abrutyn, 1997; Glazer et al., 1996; Hawisher & Selfe, 1997; Melograno, 1996; Proderick, 1998) have stated disadvantages for the use of portfolios in the classroom; especially electronic portfolios. Hawisher and Selfe (1997), believed that using computers to design portfolios would be disadvantageous because technology is not evenly distributed across schools or even within schools. Proderick (1998) continued with, "the biggest barrier to electronic portfolios is the lack of technical support for teachers" (p. 4-5).

These ideas led me to the second research question:

- What steps are involved in implementing electronic portfolios in a classroom?

Chapter Three

Methodology

The purpose of this study is to describe how one teacher implemented electronic portfolios in her classroom through a collaborative/reflective process with a researcher. A case study methodology was used to frame this investigation. Chapter Three provides a description of the setting, the participants, the data sources and data collection procedures in each of the three phases of the study, and delineates the trustworthiness of the study. The three phases were:

1. Phase One: the purpose of this phase was to give the teacher and the researcher an opportunity to learn about electronic portfolios, and to begin looking at how electronic portfolios could be managed and organized into the teacher's classroom.

2. Phase Two: the purpose of this phase was to help Teresa refine what she had learned regarding electronic portfolios in her classroom through reflective sessions.

3. Phase Three: the purpose of this phase was to observe the teacher and how she implemented electronic portfolios in her classroom.

Design

A case study approach framed the investigation. Stake (1985) states that a case is "a study of objects in their own environment, with a design relatively free of intervention or control. This work is often organized around issues of interest to lay people and perhaps reported in ordinary language" (p. 278). Two participants were central to this case study: Teresa, the teacher; the researcher and author of this dissertation; brought different experiences, beliefs, and different knowledge bases to the collaboration. Consequently, a feature of this study was that we learned from each other and as Stake suggests of interest to us.

In this study, Teresa and I collaborated in the process of the implementation of electronic portfolios. Guba and Lincoln (1989) believe:

that the interaction between the researcher and the participant results in the sharing of their constructions where the participant becomes a full partner in the design, implementation, interpretation and results of the research.

This type of research engages the researcher and the participant in an interaction utilizing an interpretive dialogue approach that creates the product of the research. It was through this reflection where their mutual goals were to understand, assist, and challenge each other's interpretation of this process (p. 231).

As the researcher, I was able to "provide valuable assistance to the classroom teacher in making the familiar strange, and interesting" (Erickson, 1986, p. 157) through the technology expertise I brought and the questioning that took place in the reflective sessions. I was able to provide this assistance by being in the classroom with Teresa and providing added support for Teresa.

Likewise, Florio and Walsh (1981) argue that there are "ethical, epistemological and pragmatic" reasons why this collaborative methodology is valuable. It treats the participant not as object of the study, but as active part of the research, whose opinion is valued and an essential part of the reflective process. Both parties gain in their understanding and knowledge. Through this case study design, a detailed exploration of the experiences of the teacher and the researcher and the perceptions of these experiences were carefully documented.

Setting. This study was conducted at The Center for Applied Technology and Career Exploration (CATCE). The setting of this new Center is different than any other school in the county and according to the Instructional Technology Coordinator for the county, in the State and possibly the United States. The mission of the center is to: "enable students to explore various career options and prepare them to make knowledgeable decisions about their educational choices" (Franklin County Public Schools, 1997, p. 4). Students are given an opportunity to explore different careers and use the technology that would be a part of these careers. This Center incorporates an innovative educational experience where the curriculum is supported through applied hands-on experiences. The Center is made up of eight modules: Environmental, Health and Sciences, Architecture and Engineering, Manufacturing, Law, Finance, Arts, and Media. The day is structured so that the students spend their entire day in the module setting. The county purchased for the students and teachers at the Center, a myriad of teaching and information processing tools. These tools included probeware, interactive

whiteboards, robotics, computer-assisted design tools, digital cameras, electronic keyboards and synthesizers, and a biofeedback system. Critical thinking skills are also integrated with the Virginia Standards of Learning which include a variety of technology skills.

CATCE is located in the county seat of a rural school district located in the southeastern United States. The county had approximately 500 eighth grade students. The entire class of 500 eighth graders shared time at CATCE, 250 eighth graders attended the center for one semester, while the other 250 attended a middle school with a conventional school setting. At the beginning of the second semester the groups switched. Within each semester the students who are at CATCE rotated through three modules, where each lasted for a six-week period. Planning began for the students' schedule in their seventh grade. The students were presented with an overview of each of the eight modules and given an opportunity to rank what module they wanted to be in for each of the six-weeks. Every student was guaranteed that they would get at least one of their top choices for the three six-week modules.

This study took place in the Architecture and Engineering module. The students spent half of the day with one teacher (Sherry) learning a range of skills that would be needed in the field of engineering or architecture. These included using architectural lettering, drawing items to scale, drawing front and top elevations for buildings and playgrounds, and building models to scale from these elevations. The other half of the day was spent with this study's focal teacher, Teresa, in the module working on the computers using robotic Legos™, doing research on architectural and engineering careers, learning how to build web pages, playing simulation games such as SimCity, and learning AutoCad. There were times where the students met as a whole group for guest speakers, video showings, and on rare occasions, for whole group instruction. In this module, all students developed the following projects:

1. a Playground Design Project
2. a Theme Park Design Project
3. a I-75 project which was developed by Teresa and Sherry as a real-world problem since one of the possible routes for the construction of the new interestate, I-75 was through Franklin County where CATCE was located

4. assorted lessons on Career Exploration, and

5. a House Design Project

CATCE's operational procedures were different from other schools in the system where the teachers had previously worked. CATCE students stayed in the same class all day, every day for six weeks. This was a challenge for many of the teachers. Some of the teachers were professionals in other fields and did not have teaching credentials. Moreover, the teachers had begun the first year with no daily planning period. The curriculum was new for all of the teachers, and a major task was to document and correlate what was taught to the Virginia Standards of Learning. In addition, many of the teachers were involved with planning a ninth grade curriculum, which would be incorporated into each of the modules during the second year of operations for the Center. Consequently, at this point, extensive demands were placed on the teachers. Most of the teachers considered the suggestion of the development of electronic portfolios to be more that they could handle. However, one teacher, Teresa, was ready for the challenge.

Participants

Teresa and I were the two primary participants in this study. The secondary participants consisted of the teacher's co-teacher (Sherry) and the students.

Primary participants. Teresa had been a middle school teacher for eleven years. She is the lead teacher for the Engineering and Architecture Module at CATCE where she has been involved in the creating and writing of the new eighth grade curriculum for the past two years. She was also the building technology representative and was responsible for technology updates, troubleshooting, and training.

Teresa's interest in portfolios had begun two years prior to the study when she was a member of the County Alternative Assessment Committee. She believed that the committee would be considering alternative assessment for all content areas so that the students would be given an opportunity to express their knowledge gained through multiple avenues. But the main focus of the committee shifted to developing a writing rubric for all grade levels. This rubric eventually became more of a checklist of what was to be in the writing portfolio rather than a way to assess or showcase the students' writing.

In Teresa's previous assignment at the middle school she really wanted her students to be able to showcase the work that they had done in her Social Studies class so she thought about how portfolios could be more student-centered rather than just a checklist. After a semester of trial-and-error she felt that she was not getting the results that she wanted so she gave up on the portfolios in her classroom. She felt that did not know how to incorporate the portfolios into the management of her classroom. In her class, the students followed a very structured schedule that did not leave much time for adding portfolios.

When I began going to CATCE I explored the use of technology with Teresa in her classroom for a semester. I regarded Teresa as an innovative project-based teacher whose energy level was unbeatable. I also observed that she was a leader and well regarded amongst her colleagues. Several teachers in the building who knew Teresa often stopped by her module to ask her questions about the students and how to handle all of the work that needed to be done, especially the correlation of the Virginia Standards of Learning. Teresa willingly shared her organizational forms with others and encouraged the others on how they could accomplish all the tasks set before them. One teacher remarked, "I don't know what we would have done without Teresa! She is always up on what needs to be done and willing to share with all of us." Teresa was a willing participant in this study. Prior to this year, Teresa had always taught in a team with three other teachers and she missed the discussion and reflection that went on between the other team members and her. She enjoyed talking about her teaching and was enthusiastic about the reflective sessions that became a central activity in our work together.

Before graduate school, I had been a classroom teacher for fifteen years primarily working with middle school age children. At the time of the study, I was a full-time clinical faculty member at the Virginia Tech where I worked on my doctorate in Instructional Technology. This clinical position was located at CATCE thus affording me the opportunity to be involved twice a week where Teresa worked.

When I decided to leave teaching, to begin my doctoral program, my goal at graduate school was to learn about computer technology so that I could return to the K-12 environment and help teachers use technology in their classrooms. For the past four years I have been involved in training teachers in the use of adaptive technology for special

education teachers, training pre-service and practicing teachers in the uses of technology in instruction, and in the development of workshop materials that address how technology can enhance college professors and K-12 teachers' teaching. Since the study I had a position where I was Director of Academic Computing at a small liberal arts college in central North Carolina. There I continued to help faculty in learning the basics skills of using technology as well as how to integrate technology into their instruction. I have since returned to a position at the University where I am finishing my doctoral work.

With my teaching background I am well aware of the complexities that teachers face everyday in the school setting. I am also well aware of the lack of planning time and meeting time needed when a teacher is trying to implement an innovation in his/her teaching. Thus, I have a sensitivity to the difficulty of change. This knowledge may be looked on as a bias in this study but I felt that it would be more of a help than a hindrance because at these training sessions and at CATCE I was looked upon as a colleague and not a "researcher".

Secondary participants. The secondary participants in this study were Sherry and the students. At the time of the study, Sherry was Teresa's co-teacher and, by profession, a graphic designer who worked as an interior decorator before becoming a teacher at CATCE. She had no formal training as a teacher but commented that she truly enjoyed working with the students. Sherry had a baby during the school year when this study took place and so was not involved in Phase One of the study. Sherry's role in this study was to help the students develop all of the artifacts that went into the portfolios. Sherry did not come back to the Center for the second year choosing to stay home with her baby. She does occasionally substitute at the center.

The other secondary participants were the eighth grade students. In the first phase of the study, there were 12 students, in the second phase there were 30 students and in the final phase there were 31 students. In Phase One, we wanted to limit the number of students so that we could test the idea and develop our working relationship. Then, in the following two phases, we worked with the entire class. These students were grouped heterogeneously in regards to their skill level both academically and technologically. There was always an effort made by the counselors who scheduled the classes to have an

equal number of boys and girls in the module as did Teresa when she grouped the students in her class into their two groups.

Data Sources

Fieldnotes, audio recordings, email, informal interviews, and reflective sessions were the data sources for this study. These various sources are described below as well as the extent to which they were used in each of the three phases.

Fieldnotes. LeCompte and Preissle (1993) defined fieldnotes as, "written accounts made on the spot or as soon as possible after their occurrence (p. 224)." Fieldnotes were written to describe what occurred in the classroom in regards to portfolios. They were also used to note changes in the process of implementing portfolios while Teresa worked with the students, and questions that I wanted to ask Teresa. They also included ideas that I had for possible changes in the way Teresa worked with the students or changes to be made in the organizational process of the portfolios. Fieldnotes included extraneous happenings of the day such as schedule, assignments, and occurrences that were outside of the normal schedule. These included statewide testing days, snow days, and days when there may have been a substitute. Field notes were kept for each of the three phases. During Phase One the notes were written at the end of the day to document these extraneous happenings that had taken place between the students and me and between Teresa and me. During Phase Two the fieldnotes were written while observing the students and at the end of the day. During Phase Three of the study fieldnotes were kept while observing Teresa as she worked independently with the students. Many times these fieldnotes were elaborated by writing down additional events as they occurred to me in my hour and a half drive between CATCE and my home.

Reflective sessions. Reflective sessions took place after school where Ely (1995) described the setting as "more planned and usually carried out away from the action, so that there is a chance to talk in peace and in greater depth" (p. 57). Over the 15-week period Teresa and I conducted ten reflective sessions conducted in her classroom. For Phase One these reflective sessions consisted of planning the best way to begin implementation of portfolios in her classroom and reflecting on literature that I had collected on portfolios. We planned activities for implementing portfolios for four or five sessions. Then at our next session we reflected upon these activities and discussed what

worked and what did not. We then planned another four or five activities for the upcoming days. As the study progressed, the reflective sessions were spent on discussing what worked or did not work in the implementation process. These reflective sessions encompassed what Schön (1987) described as the coach (in this case, myself) and the student (Teresa) formulating qualities the student wanted to achieve, then by demonstration or through description, they explored different ways of achieving different outcomes.

It was during these reflective sessions that most of our collaboration took place. We decided on something we wanted to talk about and then we discussed the appropriateness or inappropriateness of the activity, thought or idea as it related to the implementation process.

Audio recordings. Audio recordings were made of the initial two discussions regarding portfolios and the ten reflective sessions. In addition during the final phase of the study, I was provided by the county with a portable recording system; Teresa wore a microphone and I recorded all of her talks with the students regarding portfolios. I wore an earphone so I could turn the recording device on when Teresa talked about portfolios and off when she talked about something else. During each of the 12 observations I was in constant eye contact with Teresa and if the device was turned off and she began talking about portfolios we developed a signaling system so I would know to turn on the device. A total of 24 audio recordings were later transcribed.

E-mail. Teresa and I exchanged email when I was not in her classroom, especially during the final phase of the study. There were 32 emails exchanged during the three phases: 10 in the first, 7 in the second, and 15 for the final phase. During the final phase Teresa emailed me everyday to document what occurred while working on the portfolios but as the six-weeks came to an end and Teresa's workload increased the emails were less frequent. These emails were kept in a specified mailbox in the email package and printed.

Informal interviews. Informal interviews could be characterized as "friendly conversations" (Ely, 1995). They took place throughout all the phases of the study, whenever the need would arise: during lunch, student independent work periods, student help sessions, or while we monitored the students on restroom breaks. During the final phase of the study while I recorded all of Teresa's conversations with the students. She

occasionally told me things informally over the microphone that she wanted to talk about in our reflective sessions or ideas that she wanted noted for later discussions.

Data Collection Procedures

Data were collected throughout the three phases (see Appendix A for Calendar). Because of my differing roles across the three phases, different data were collected at different times and in different ways. As the study began I worked with the students and Teresa observed. As the study progressed my role working with the students diminished and by Phase Three of the study Teresa did most of the work with the students while I observed. As these last six-weeks came to a close, I helped some students with technology issues so that the portfolios could be completed.

First Phase -- January 26 to March 5. This first phase of the study lasted five weeks. I was a full participant in the classroom trying to implement portfolios in the classroom (Spradley, 1980) (see Appendix A for Calendar). During these five weeks, while I worked closely with the students (6 times), Teresa observed first hand. I included Teresa whenever possible in the on-going activities as they related to the portfolio implementation process. In this full participant observer role Teresa and I both watched, listened, and interacted with each other (LeCompte & Preissle, 1993).

Teresa and I met after school six times during this period to discuss what occurred in her classroom in regards to the portfolio implementation process. All meetings were recorded and were later transcribed. During the first two meetings Teresa and I discussed portfolios and developed a framework from the books and articles (see Appendix B for List of Portfolio References) I had collected to begin my work with the students. As the discussions turned to reflective sessions we discussed what had occurred during class, what needed to be changed, and what we had learned about the portfolio implementation process.

Second phase -- March 9 to March 18. The second phase of the study comprised of the first three weeks of a six-week rotation, Teresa worked with the students on the portfolios while I helped on three occasions with scanning and taking digital pictures of the artifacts that went into the portfolio. Teresa and I met for three reflective sessions during this phase, each of these sessions were recorded and later transcribed.

Due to other obligations I was not involved in the entire process of the development of the portfolios during the last three weeks of this second six-week rotation, though Teresa and I exchanged seven emails throughout the period. These emails resembled reflective sessions where Teresa wrote about what she had done in class, if it was successful or not, and how she would change it next time. I emailed he back my thoughts on what she had written.

Third phase -- April 22 to June 4. Data in this phase were gathered over a six-week period, aligned with the final module rotation for the school year. I was primarily an observer in Teresa's classroom and visited on 14 different occasions. But, I also continued in my role as a clinical faculty member helping with the technology use in the Teresa's classroom on a limited basis.

Because of our work together in the first and second phases of this study, Teresa and I had developed a good understanding of what needed to be done to get the students started with their portfolios. Teresa and I met after school the week before the study to determine what portfolio activities Teresa would do over the six-week period as well as note what needed to be done over the first five sessions. These activities included introducing portfolios, organizing a portfolio, choosing artifacts for the portfolio, and writing about that artifact.

As the study continued, Teresa and I met after school four times for reflective sessions. These reflective sessions were used to talk and think about problems; concerns or progress that occurred as Teresa worked with the students on their portfolios. For example, if I asked Teresa what problems had occurred since we last met, we identified problems, generated options that might solve the problem and considered solutions to the problem. These reflections are what Schön (1991) refered to as reflection-on-action, which refered to "the ordered, deliberate, and systematic application of logic to a problem in order to resolve it" (p. 164). This sort of thinking involved familiar data and past experiences. In addition, during these sessions Teresa and I discussed my fieldnotes that had been previously taken and transcribed looking for corrections and additions.

Also in these reflective sessions, as in the initial session, a list of portfolio activities was generated for the upcoming times that Teresa would meet with the students. This list was reviewed each time we met to determine what had been accomplished, what

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had not been accomplished, what changes were made in the activities, and what activities the teacher would keep, thus making this process recursive.

During this phase of the study, I also observed Teresa during the school day while she worked with the students on their portfolios. I used fieldnotes to record what she was doing with the students whether it be helping with technology, helping the students write their reflection statements, or addressing other needs and concerns regarding portfolios. These fieldnotes consisted of two parts. The first which were descriptive in nature were taken from observations that regarded the setting, people, actions, and conversations. The second were the reflective notes that encompassed feelings, problems, ideas, and hunches. Plans for future research were included in this part, as well as, corrections or additions to the descriptive part of the fieldnotes (Bogdan & Biklen, 1982).

In this third phase, Teresa wore a microphone as she worked with the students on their portfolios. These recordings were later transcribed and used for writing the chronology of events. These transcriptions also included the comments that Teresa made to me regarding ideas and thoughts that she wanted to talk about at our reflective sessions.

Further data sources were notes from conversations with Teresa during breaks, lunch and planning periods. Also included in the fieldnotes were my reactions to events, interviews, reflective sessions, and reactions to the research itself. These reactions were used during the reflective sessions with Teresa to identify problems, options, and solutions.

Data Analysis

LeCompte and Preissle (1993) recommended that data analysis began with a review of the proposal or plans with which the work began. Secondly, the transcriptions and other data sources should be scanned for completeness and reacquaint the researcher with what had taken place during the study. While the scanning and rereading took place, I identified those points that I felt were important in telling the story of Teresa's and my collaboration. As I read the transcripts I would make identifying marks on the margins. When another domain would emerge I would then reread the transcripts and see if that domain was represented in the previous data. My analysis was based on my review of the literature, my experiences as a teacher, and my work in the clinical faculty position. This

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type of analysis is used when one is trying to represent participant meaning (LeCompte & Preissle, 1993) and the relationships among these meanings. I developed the following coding system based on Spradley's (1979) categorical analysis. The major domains of the analysis were reflection, management, technology and the portfolios themselves (see Appendix for C for Coding of the Major Domains and the Component Categories).

I started writing according to the chronological events and organized the content according to the domains and component categories.

Trustworthiness

Trustworthiness is used in qualitative research as the metric for assessing whether the research findings are accurate and whether the study can be replicated. Lincoln and Guba (1985) call this trustworthiness, which if done correctly shows that the research is worth paying attention to and accountable. They use four techniques to demonstrate the trustworthiness of a study, and they are credibility, transferability, and confirmability. In the sections below each of these techniques will be addressed and how I accounted for each of them.

Credibility. Lincoln and Guba (1985) refer to credibility to the extent to which credible findings and interpretations will be produced. A key activity that provides for high credibility includes prolonged engagement. I established credibility by having my research include three phases. I spent 15 weeks in the field building trust, using the Teresa's point of view as well as my own, and having reflective sessions with Teresa learning about her and her views on portfolios. The second activity is "persistent observation" which deals with being able to identify those characteristics that are most relevant to the study. I kept detailed fieldnotes. The fieldnotes changed over the phases but I was able to elaborate on them as soon after as possible. Triangulation, the third activity, involves collecting data from multiple sources, which I did through observations, participation and reflective sessions. The second technique used in establishing credibility is peer debriefing. I used Teresa as the peer debriefer and Teresa used me as a peer debriefer. Teresa and I would exchange ideas and we would bounce these ideas off each other during our reflective sessions together and during anytime during the day that time was available. This happened during the reflective session where the two of us pushed each other to develop and test next steps. During these sessions we suggested and

asked each other about the next steps to be taken in the implementation process. Guba and Lincoln (1989) refer to the last activity as member checking. They believe that member checking serves a number of functions:

- that it allows for assessment of intent of a given action

- it gives the participant the chance to correct errors

- it provides for the participant the chance to offer additional information

- it puts the participant on record that he/she agrees with the information, and,

- it gives the participant a chance to confirm the overall accuracy of the data.

Once again Teresa agreed to read through the data to verify interpretations by the researcher.

Transferability. Transferability refers to the ability of the study to be useful in understanding the same phenomenon or similar phenomenon in other contexts. Lincoln and Guba (1985) believe that in a qualitative study the researcher cannot generalize findings but can only provide the thick description necessary to permit someone else to find interest in the data to make their own transfer and whether a conclusion can be reached about the validity of those conclusions. Geertz (1973) refers to the notion of "thick description". As with any qualitative study an enormous amount of data was collected for this study which included the rich descriptive talk that Teresa and I did of the day to day events and practices. A thick description is shown in this document through the chronology of events.

Confirmability. This is where the researcher must authenticate that the findings are not a product of his or her own biases (Lincoln & Guba, 1985). This is where the audit trail is traced back to the raw data. In order to provide this thick description recordings of discussions and reflective sessions were made and transcribed. Observations were recorded in fieldnotes and analyzed as they transpired. From these the reader can audit the findings.

Conclusions

When I started the study in January and on to June, I became more aware of what data needed to be collected and how much. During the first two phases the task of data collection seemed overwhelming and I did not know what to write down when. As stated before in the final phase, I was able to obtain a recording device which recorded Teresa's

conversations and I could concentrate on what was happening around her and why. Because there were more extensive notes for the final phase of the study my writing is superior to what was written for the first two phases. I began to understand what was happening in the classroom and could express those ideas much better than in the beginning phases of the study.

Chapter Four

Discussion, Summary and Reflections

Chapter Four summarizes the 15-weeks I spent in Teresa's classroom. A more elaborate reporting can be found in Appendix D - Chronology. The study is reported in three phases. Each phase begins with a descriptive summary of the discussions, observations and reflective sessions conducted by Teresa and myself (see Appendix A for Calendar). The summary of the first phase describes the beginning of the journey into implementing portfolios. During this phase, which lasted three weeks, Teresa and I worked with a small number of students where I was the teacher and Teresa was the observer in all aspects of the implementation process. Phase Two begins to describe the changes in the teacher and researcher collaboration, Teresa's move into becoming more independent in her management of the implementation process, her becoming more familiar with helping the students with their reflections, and use of the technology. Phase Three describes the six-week period in which Teresa took full responsibility of the implementation process and where our reflective sessions are limited. These summaries are followed by conclusions in regards to the two research questions.

The format for the conclusions will be: conclusions for Phase One will be stated, then for Phase Two, the Phase One conclusions will be repeated and then new conclusions will be addressed for that phase. For Phase Three, the conclusions for Phase One and Phase Two will be repeated and then new conclusions will be addressed for the Phase Three. It is hoped that the reader will see how Teresa and I progressed from one phase to another and how we refined the implementation process.

Phase One

Summary. Teresa and I started this journey with the understanding that we did not know what lay before us. At the outset we knew that our collaboration and the implementation of electronic portfolios would be components of the project that would require our attention. It was our plan to study these dynamics, and refine them, so that other teachers might benefit from our work.

During this five-week period, Teresa and I met together for seven reflective sessions. I worked with the students on their portfolios or with the technology six times. Teresa and I spent two hours discussing portfolios in our first conversation. I shared

several books and articles I had collected regarding portfolios (see Appendix D for Portfolio References) during this session. We reviewed the books and articles, as we begun our reflective sessions, and decided that the type of portfolio we wanted to use was the showcase portfolio. This would allow the students to show off their work. We also decided that I would work with 12 of the 28 students that she had in her module that six-week period. These students were expected to be motivated by the privilege. They represented a diverse range of students: academic achievers, as well as, students not so inclined; artistic students; students who were deemed to be in need of a different modality that would help them understand their potential; and students who had a reputation for their willingness to take-on additional tasks. There were two reasons that students who had a reputation for disrupting class were not chosen. We felt that we needed full cooperation by all of the students in order to give Phase One a fair chance, and that the disruptive students would be better served in the actual study as a consequence of productive developments in Phase One. Ten of the twelve students volunteered for the project. By the fourth class meeting, four of the ten had withdrawn. The students who completed Phase One were the students Teresa had predicted to do well based on an identification of five factors. Each student that completed Phase One had a history of regular attendance, good grades, completing assignments, concern for performance, and optimism for academic tasks.

The students had already finished a few projects, at the start of Phase One, so the students and I discussed what portfolios were, and how we were going to construct their portfolios. The students used a "storyboard" to help them visualize their portfolios. I also helped the students to use PowerPoint™, the piece of software that was chosen in which to place the portfolios.

As Teresa and my reflective sessions continued we would discuss the things I had been doing when I worked with the students while Teresa observed me. Teresa's main concern, during these sessions, was a time management issue. She was concerned that she would not have time to digitize the students' work, so it was agreed that I would digitize the students' artifacts and have them ready for the students when they were needed. Teresa's other concern was stimulating reflective thinking. We selected one tool (see Appendix E for Two Stars and a Wish) directly from one of the portfolio sources

(Farmer, 1997) that we examined , and one was created based on reflection sheets from other books (see Appendix F for Reflecting on Your Work). We created our own reflection sheet because we felt that those that we chose best fit with the students.

The students worked on their portfolios independently as Phase One came to an end. Teresa continued to deal with the management issue and whether or not the students would finish. She began to rearrange the other work that students were required to do so that they could finish their portfolios. We made the following observations in the last reflective session of Phase One:

- Even though the portfolios were taking up time from other instructional activities, and other station work Teresa had used in previous classes, she felt that the skills the students were gaining from the portfolio experience were as equally important. These included organizational skills, writing skills, and developing creative skills. The students were also learning to use the technology as outlined in the Virginia Standards of Learning (SOLs) and other English SOLs (see Appendix G for English Standards of Learning that can be met by Implementing Portfolios).

- We determined, from our observations that the students had a good working knowledge of PowerPoint™ and that this application lent itself to portfolio development.

- And lastly, even with the shortened period of time, of the six students who remained, three of them completed their portfolios. The other three would have opportunities to finish their portfolios in their remaining time at CATCE. Those who completed their portfolios had the option of adding to their portfolios as the semester progressed.

Reflection and collaboration. I had served in other capacities at CATCE prior to approaching Teresa about the possibilities of using her students for my research. Therefore, our relationship was not that of a researcher and public schoolteacher collaboration in its strictest form. Further, Teresa and I seemed to possess many undefined characteristics that would have enhanced our friendship had the project not been the catalyst that brought us together. Importantly, however, was Teresa's intrinsic motivation to become more technologically literate. Therefore, my availability served her

well, and the project entailed many features Teresa would be able to use in the future across curricula, students, and settings. Thus, our relationship was a symbiotic one, but we discovered that the reflection aspect of the project enhanced our learning, the students' achievements, and our personal relationship, as well.

We understood that reflection exists on a continuum that ranges from incidental thought, to deliberation, to research, we reflected on how we might use reflection for the study. It came to our attention that the literature noted that teachers have used reflection "constantly" (Paris & Ayers, 1994); or that it was "just internal brainstorming," (Lytle et al., 1992); or "constant interaction," (Calkins, 1985), or an "internalized state of mind," (Clift, Houston, & Pugach, 1990). Therefore, it appeared that there was no way we could escape reflection. So, we noted that it would be both an individual and a collaborative practice, and that we would even demonstrate, facilitate, and require it of the students. Despite the "constant" nature of reflection, however, Teresa and I decided that we needed to set aside specific times for reflective collaboration, and that the short term goal of our reflective sessions would be to gather and analyze data (Lytle & others, 1992). The long-range goal were developments that might inform the practice (Calkins, 1985).

We began the process, largely, as equals. My "ownership" of the expertise in technology was probably greater than Teresa's, but she had ownership of the elements I needed for the project. The fact of territorial boundaries was never discussed in a resentful manner, because the time that was set aside for reflection allowed the communication that made the collaboration work. We did reflect on our roles for Phase One, however, and we found it appropriate for me to lead the instructional activities while Teresa observed and made notes pertaining to an efficient management and organizational scheme for the study.

Portfolios. It was noted that although I had the expertise to create electronic portfolios, I had never done it with an actual class. Therefore, Teresa and I were equal in our search for a management and organizational process. Our initial collaboration brought us to adhere to two guiding principles. We understood that it would be a huge undertaking and adjustment for the students, and it would be best to take it slowly (Danielson & Abrutyn, 1997). Additionally, we were reassured by the literature that noted that there was no "one" way to implement electronic portfolios (Black, 1996;

Engel, 1996; Glazer, Rooman, & Luberto, 1996; Melograno, 1996; Seidel, et al., 1997; Wolf, 1996). And, just as Melograno (1996) observed: "Teachers may say, 'I have too many students and not enough time.' The reality for most teachers is to manage students first and deliver some kind of instruction second" (p. 154).

These findings heightened Teresa's concern about the amount of time the project would require. Our reflection and collaboration on this matter helped to resolve the matter, however, because we discussed the fact that there would be two of us to share the responsibilities. Also, our reflections on this matter brought us to the understanding that throughout our teaching careers we had often been confronted by change and innovation. Certainly, the electronic portfolios would be unique in their own right, but on the other hand they would be no different from any other new program or advancement in educational theory and practice. Thus, we were armed with rationale for going slowly, customizing the process to meet the needs of all of the stakeholders, and the knowledge that changes are an eternal, ongoing process. Our reflections revealed that not only had we adapted well in the past, we had also been considered to be leaders. This new perspective seemed to erase our reservations while at the same time reinforced the excitement we shared about the project. Therefore, we began to realize the true, supportive meaning reflection can add to a collaborative project.

Teresa and I decided that Phase One had been productive and that it would enhance the project. One of the major accomplishments was that Teresa gained the confidence to take charge of the instructional responsibilities for the remaining phases of the study. She did this by adding another rotation to her station work. We noted that our process had included a series of steps that might apply to anyone who might want to develop portfolios. These steps included:

a. A storyboard, using index cards, was used to help students visually see the portfolios develop.

b. A different color of index card was used to represent the different components of the portfolio.

c. A set of prompts to encourage reflection on the artifacts was developed for the portfolio.

Phase One ended in a flurry of trying to get the portfolios completed, but we felt that we could begin the next phase of the study armed with enough knowledge to get off to a good start. From our reflective sessions, we concluded the following regarding the implementation of portfolios:

1. PowerPoint™ was the primary software used to develop the portfolios.
2. Technologies used were computers, scanners and digital cameras.
3. Students needed to sacrifice their recreation time in order to work on the portfolios.
4. I was designated as the instructor, and this was done via demonstration and practice.
5. Teresa was a co-participant. Her two responsibilities were to analyze the process so that the portfolio project could be incorporated into the regular school day once we began the actual project, and, secondly, to learn the technology along with the students.
6. Showcase Portfolios were selected as the style of portfolio used in the project.
7. Reflection was a valued component of the process and would be required of the students.
8. Twelve of the twenty-eight students in Teresa's class were invited to participate in Phase One.

Phase Two

Summary. This part of the study began with Teresa beginning to change roles and responsibilities. We used the next six-week rotation as Phase Two. This allowed Teresa to have more time to weave the portfolios into her instruction. Teresa and I met for five reflective sessions, I observed Teresa once, and worked with the students on three separate occasions. During this time Teresa took over the implementation process and I continued to deal with the technology issues.

We decided, in our first reflective session during this phase, that all students would begin a portfolio and then choose if they wanted to continue doing a portfolio. Teresa's had several workstations set up in her classroom. She wanted the students to enjoy all aspects of her instruction and not feel that all their time needed to be spent on the portfolio. It was also decided that more time would be spent on reflection so we

reviewed the reflection sheets and pinpointed some of the language that was used and developed a list of eighteen open-ended statements and questions (see Appendix H for Open Ended Statements and Questions to Use for Your Journal). Teresa continued to emphasize reflection and made time to meet with the students, in their groups, about what they had done with their projects and the different artifacts that came of their work. She had begun to help the students make connections throughout all their work and hoped that this would encourage more reflective thinking.

The summary of Phase One noted that storyboards were used to organize the students' work. Envelopes were used to store the students' work, in Phase One, but we decided we would use large pieces of paper and the students would glue their index cards to these sheets of paper in this phase. We also decided that I would write up instructions for manipulating pictures from the digital camera and directions for using the scanner (see Appendix I for Directions).

Teresa and I had come a long way in our implementation process at this point. Teresa began to take a more active role in directing the students with their portfolios, and I mainly helped with the technology.

Phase Two lasted another four weeks. I was not in Teresa's classroom, during this time, and we tried to keep in contact by email. These emails pertained to Teresa's progress with the portfolio process. She indicated that all students did go through the portfolio process and the majority of them completed their portfolios at the end of the four weeks.

Reflection and collaboration. Teresa and I continued our practice of reflection and collaboration and we came to a new awareness of the fact that reflection was constant and that collaborators cannot escape the practice due to the very nature of the reflective process. We were affected by this understanding, and our own reflective-collaborative process had reinforced the value of reflection and collaboration. Thus, the reflective-collaborative process began to have a greater meaning for us as a consequence of these realizations, and we became convinced that reflective practices and skills were essential for the students, also. In short, we became believers. Clift, Houston, and Pugach (1990) state that "This means that reflective practice must be internalized by those who practice it, and they must believe in its worth and utility for making things better" (p. ix-x). Thus,

these two practices seemed to be essential for the understanding that I noted in the March 10th meeting with Teresa. She noted that she had arrived at a point wherein she knew what she wanted regarding the process, the portfolios, and the project. Then, she demonstrated this sense of belief, direction, and conviction for the reflection-collaboration process by allowing students to collaborate on March 12, "In the afternoon group Teresa made a drastic change. She decided to have the students work in groups of four. … Since they were in groups they were talking with each other and took the assignment seriously."

Thus, Teresa demonstrated her belief in the collaborative process by altering from her traditional practice that required students to work individually. It was not a simple matter, however. We had concluded from the literature that reflection was an evasive practice that individuals engaged in constantly, but there was not a concrete definition of the process, or any one correct process to follow when arranging for reflection. As such, the reflection component of the project was noted to cause misunderstandings among researchers. Clift, Houston, and Pugach (1990) stated that, "There is no single appropriate definition of reflective practice and no single set of strategies that best emplify it" (p. ix-x). Therefore, the ambiguity of the practice also caused difficulty for the students in this study. Noting this, Teresa and I reflected and collaborated on the matter, then gathered and created various prompts and questioning techniques that had the potential to prompt the students to reflection.

We had the students collect artifacts for their portfolios and write their reflections on cards that revealed the reasons they had chosen any particular artifact. We prompted the students by using dialog aimed at having the students explain the meaning an artifact had for them. This prompt and practice technique seemed to serve us well in Phase Two. Thus, we became more deliberate in our practice. Paris and Ayers (1994) stated that when teachers become more deliberate in their reflective practice they use various aids and prompts, "Teachers use professional journals, conferences, and workshops to reflect on their own practices," (p. 135). Therefore, we concluded that artifacts that have meaning for an individual were excellent prompts for the reflective process. We found that the students were often anxious to share the artifacts they had chosen for their portfolios, and sometimes, even very talkative, enthusiastic, and proud of their perceptions, associations,

and relationships with the item. This type of artifact selection facilitated the reflective process. This example shows that not only were Teresa and I beginning to understand the reflective process but Teresa, in particular, felt that this process was important that she wanted her students to use a reflective and collaborative process.

In summary, Teresa had come to understand that to get what she wanted out of the students she needed to have an idea of what she wanted. We begun to have an idea of what we wanted to do rather than "let's try and see if it works."

Portfolio. Teresa and I collaborated and shared our reflections on Phase One that had been completed, and on Phase Two that was scheduled to start soon. We decided that Teresa would be responsible for the implementation process; I would focus on the technology aspects (i.e., digitizing artifacts with the digital camera or scanner); and that all of the students would begin the portfolio project. If the students found that they did not want to continue with the electronic portfolios, they were allowed to drop out at any time. We realized that some of the students found greater meaning in some of the station work that utilized the software used by architects or engineers. We noted that the reflection and collaboration components of the project served as rewarding experiences wherein the students found pleasure in the social aspects of talking about their creations. They appeared to want to be part of the group. This was encouraging because Grady (1992) notes: "When students can ruminate about their work they are taking charge of their learning and becoming aware of what and how they learn. This awareness, or metacognition, helps students move from passive to active learning" (p. 24).

In conclusion, we were pleased with Phase Two. As stated in the introduction of this chapter, the list of conclusions from the previous phase will be repeated then additional conclusions from Phase Two will be added in order to reflect the ongoing evolution of the process.

1. It was concluded in Phase One, that PowerPoint™ was the primary software used to develop the portfolios. PowerPoint™ continued to be the primary software used, in Phase Two, but, students in Phase Two were not as familiar with PowerPoint™ so more direction had to be given on how to do navigational buttons in PowerPoint™.

2. It was concluded in Phase One, that the technologies used were scanners and digital cameras. These technologies continued to be used in Phase Two. I continued to be responsible for the technology issues. I showed one student how to use the scanner so that he could do the scanning when I was not available, during this phase. I also wrote directions for downloading pictures from the digital camera, the software for manipulating pictures, and the scanner. I showed more students how to take photos with the digital camera and scan pictures, as Phase Two progressed.

3. It was concluded in Phase One, that students needed to sacrifice their recreation time in order to work on the portfolios. Students developed their portfolios during the regular class time, in Phase Two.

4. It was concluded in Phase One, that I was designated as the instructor, and this was done via demonstration and practice. Teresa became the instructor and her technological expertise continued to grow in Phase Two.

5. It was concluded in Phase One, that Teresa was a co-participant. Her two responsibilities were to analyze the process so that the portfolio project could be incorporated into the regular school day once we began the actual project, and, secondly, to learn the technology along with the students. These responsibilities continued for Teresa, in Phase Two, but her primary role changed to lead instructor. This provided more "hands-on" practice for her.

6. It was concluded in Phase One, that Showcase Portfolios were the style of portfolio to be used in the project. We continued to use Showcase Portfolios in Phase Two.

7. It was concluded in Phase One, that reflection was a valued component of the process and was required of the students. There was a greater understanding and enhanced appreciation of reflection in Phase Two, and further prompts were developed to help the students write their reflections and understand the process. Teresa added that when writing your reflection she told the students, "Tell all that you can. Don't assume that everyone knows anything about what you are doing."

8. Twelve of the twenty-eight students in Teresa's class were invited to participate in Phase One. All students, in Phase Two, started a portfolio but they were given a choice about whether they wanted to finish the portfolio.

The process that evolved with an ongoing refinement during Phase One and Phase Two had informed our practice in regards to the process itself. Teresa and I were pleased with our progress, and we felt confident about Teresa's mastery of the technology. We were also pleased with the methodologies we had used to assist the students with their reflections. Steps were also added or changed to the implementation process. They included:

1. The storyboard used was a large piece of paper where the students could glue their index cards that represented the different components of the electronic portfolio.

2. The students were told what color index card to use with each project and activity.

3. Students began working on the portfolio during the second week of the six-week rotation.

4. The concept of electronic portfolios and the idea of reflection were introduced from the beginning of the six-week period.

5. Students did a brainstorming session to make connections between the different artifacts after the first project was introduced. This was done to stimulate reflection.

6. Students began to develop their slides after seeing examples of the portfolios the students created during the last rotation.

Teresa worked alone on the implementation process for the rest of Phase Two. We tried to keep in touch by email but we found that this was not a satisfactory means of communication for reflection and collaboration because there was no immediate response to what we were each thinking.

Phase Three

Summary. This part of the study was done in a more deliberate and sophisticated fashion than was Phase One or Phase Two. The crucial difference was that I was an observer in the classroom. I observed, took notes, and made audiotapes of the sessions

while Teresa worked with the students. Teresa and I met for three reflective sessions, and I observed on thirteen separate occasions, during this phase, and a difference occurred in our collaboration. We were able to collaborate "on the fly." We seemed to be able to read each other's minds and intonations. Teresa and I collaborated as she worked. If she had something that she wanted me to remember or to reflect about later, at lunch or in between working with the students, she just talked into her microphone.

Teresa and I, based on the data gathered during Phase One and Phase Two, decided that there were some changes that we wanted to make to the organization of the process of implementing electronic portfolios. We wanted to reconstruct our process and communicate our modifications clearly before the six-week rotation began, when Teresa would be totally on her own. We had developed an outline of what we had done during the first two phases (see Appendix J for Organizing the Portfolio A).

Teresa and I had come a long way in our way of thinking about portfolios over the last nine weeks. We appeared to have learned a great deal about the potential uses of technology in the classroom, as well as, mastering the mechanical functions and operations. Our vocabulary seemed to be changing, too. The sum total of these observations seemed to bring out a new found confidence that we had begun to see evolve in ourselves. And, importantly, the familiarity and confidence Teresa was gaining appeared to have an effect on her enthusiasm for using technology in the classroom.

Two major achievements were noted on the second day. First, most of the students were working independently of Teresa's guidance and instruction. The students were working at their computers alone and not asking many questions. Second, many students had progressed to the point where they were helping their classmates whenever they needed assistance with a task. Two other things of note took place on this day. One, despite having worked extensively in their journals, many students still needed help with reflections. Two, Teresa clearly emphasized the fact that the portfolios were to be done in a neat and professional manner.

We discussed, during our second reflective session, the quality of the reflections versus the quantity of the material we wanted to present, as well as, the degree of mastery we desired. We discussed the fact that this rotation was for six weeks. Therefore, would it

be better to expose the students to more, and expect less of the "neatness and professionalism" Teresa had required of students in the past.

We then began to reflect on Teresa's use of a peer editing activity that she had developed (see Appendix K for Peer Editing Activity). This activity enabled the students to look at each other's work to get ideas about what they could do for their portfolio, as well as, have the chance to evaluate each other's portfolios.

We also discussed the students' positive response to the project as we progressed through the rotation. Teresa noted that this was an exceptional occurrence. "It's the group," she said. She then reflected on the possibilities of giving extra credit for exceptional work, and again stated, "But I think that it's the group. I think that if you have just a handful that are meticulous, and want things to be precise, and have high standards, it spreads. ... I think this class seems to be very serious about their drawings, too."

This particular "group" was in the last few weeks of the eighth grade and had the experience of being at CATCE for 15 weeks. Therefore, their maturity and the related experiences they had gained while at CATCE were probably a factor in their interest, cooperation, and mastery of the requirements. However, we also noted that other variables such as meaning, the medium, and mastery of the medium were now coming to fruition. We had planned for these dynamics to be effective, and as time had passed, we had re-evaluated and reconstructed our own methodologies. Therefore, it might have been the group, as Teresa noted, but it appeared that refining the process was a factor, as well.

Teresa noted that, "Getting them deeper is really hard. That's where I think that we probably need a tool." I suggested that she might use a rubric to get the depth she desired; something that would provide a prompt for the descriptive words Teresa thought would make the work better. We created 11 statements that we felt were important for outstanding portfolios and developed a rubric from those statements (see Appendix L for Associate Work Evaluation--Portfolio Evaluation). It should be noted here that this rubric was used to make sure that the students had all the components in their portfolios. The students were not assessed on the content of each specific artifact or reflection. These items were assessed as they did them.

The observations continued and Teresa worked on reflection with the students, but also on the technology aspects of the portfolio. When using PowerPoint™ as a non-linear product the presentation is viewed with buttons. Teresa and I developed two help sheets on buttons (see Appendix M for Button Symbols and Appendix N for Adding Buttons to a Slideshow). She shared these help sheets with the students as they were ready for buttons.

Teresa continued to wrestle with the management, technology and reflection issues as this phase continued. Most of the students met the requirements of the project, at the fifth observation, and constructed average to better than average portfolios.

While Teresa's ability at organizing, remediating, and instructing became smoother, the major topics she covered remained the same. She spent her time calling students to order, either going over things "one more time," or introducing new material. Teresa spent most of her time shifting her priorities constantly throughout the day. Therefore, it appeared that this understanding would enhance future projects of a similar nature because the instructor would know at the outset that management, technology, and reflections would be three of the primary instructional concerns.

It should be noted that Teresa's instruction was somewhat different when she helped students with the technology versus times when she helped with the students on reflection. When she helped with the technology, giving directions was easy, or concrete. There was usually only one way to perform the required task and Teresa had the ability to perform the task, as well as, the ability to deliver the instructions to the students so that they could comprehend them. But, when working with reflection there were many options, many things that could be included in the reflection. Teresa was still searching for a method that would pull things out of the students they needed to write for their reflections that agreed with her own ideas of reflection.

This idea continued into the seventh observation. The term reflection appeared ninety-three times in the transcription of this observation. This constant referral to the reflections presented a powerful classroom effect. Reflection was something that Teresa tried to stress with the students, however, and it seemed that the students were not able to understand the concept of reflection and what needed to be written to satisfy the reflection requirement. It might have also been that Teresa was still not familiar enough

with teaching the students how to write a good reflection, so once again it needs to be emphasized that this is a learning experience for both Teresa and the students. I never felt that Teresa ever developed a true definition of her own in regards to reflection. In LaBoskey's (1994) study on what is needed to teach reflection she says in her introduction, " it might be that reflection simply cannot be taught." And she continues with, "Perhaps an individual without an inquiry orientation cannot develop one; perhaps a novice deficient in the skills of reflection cannot acquire them" (p. xi). She also noted of her students that those who were able to ask "why" questions rather than "what" questions were more successful in writing reflections (p. 118).

Teresa also appeared to be more flexible, and her directive teaching style changed. I concluded that this must be due to the fact that she observed that most of the students would finish their portfolios and that she was visibly more comfortable with the process.

Teresa made many decisions regarding the portfolios on a minute-to-minute basis, during the final week of observations. The school year was ending and some of these decisions adhered to our guidelines and some did not. It was also during this period that my role shifted somewhat. At times, I was called upon to help the students with their technology issues.

Our final reflective session occurred during this time. It was evident that we both respected what the other had brought to the collaborative effort. We reviewed the portfolio guidelines that we had developed, as we always did, during this session. Teresa and I developed a tip sheet on what should be in a portfolio slideshow (see Appendix O for Portfolio Slideshow Tips) since the students were getting to the end of developing their portfolios. We also discussed the reasons why Teresa made changes in the guidelines. These changes were made due to the students' mastery of the topic, or skill; student motivation; absenteeism; or availability of resources. Teresa had become familiar enough with the topic of implementing portfolios that she was able to change what needed to be done almost automatically depending on the moment.

Then, we reviewed the entire implementation process; we considered the timeframes necessary to complete the various components of the project; then we rewrote

this process so that it would be appropriate for future use (see Appendix P for Organizing the Portfolio B).

Teresa's belief in portfolios as a beneficial instructional methodology was quite evident in this reflective session. Her enthusiasm during the session as she talked about extending and expanding the use of portfolios into other subject areas and grades was very genuine, especially when she said, "I really think that I can make this work! If I can get the students to write in their journals I can see them being used for all sorts of purposes." Teresa used the term journals interchangeably with the word "reflections." She saw the journal writings to be the reflections that the students would use in their portfolios.

It was evident that Teresa still struggled with how to teach reflection, as the last observations took place. But, as the end of the school year approached, and as more students finished their portfolios, Teresa seemed to be relieved to discover that the task had been manageable. Because of this, Teresa enjoyed talking with the students about their portfolios. The students had begun to show a competitive desire to complete their portfolios so as to reflect their individuality, and their pride in their work. The students had mastered the concepts to acceptable degrees of completion and they helped each other to complete the portfolios. As I observed Teresa directing students as to what needed to be completed it was my opinion that if Teresa replicated the same process, she would be more experienced and better prepared to serve all students. Further, Teresa would have a much more realistic understanding of the amount and the quality of work that could be expected from different individuals.

The last two observations were characterized as "review and get-it-finished" sessions in regards to both the portfolios and their reflections. The students were scattered around the room helping each other; working on their own. Many of the students took the opportunity to see what their friends had accomplished. A sense of enthusiasm and accomplishment was displayed by many of the students, and there were even those who demonstrated the enjoyment and pride they derived from their expertise for making PowerPoint™ slides. They requested samples of their work to take home; they wanted copies of their portfolios to show to their parents! I must say I too was very impressed

with the most of portfolios that were developed by this group of students. I have included one of the portfolios as an example (see Appendix Q for Student Portfolio).

Reflection and collaboration. Teresa and I had done a great deal of experimentation with the various aspects of the project by the time we began the final study. We had experienced a specific manner in which teachers can use reflection. We had developed theories that informed our practice. We acted as researchers observing our own work which guides our practice (Calkins, 1985). Calkins states that, "This constant interaction between practice, reflection, and study led them to flesh out and redefine their theories" (p. 143). Therefore, Teresa and I had worked through the experimentation stages learning and redefining as we progressed. We were duly influenced by the literature and understood the value of the reflection and collaboration we had incorporated into the electronic portfolio process. In addition, we had a greater understanding of reflective opportunities and their relationships to artifacts and individuals, as well as, the value and purposes of these meaning making collaborations. Therefore, we learned how to use reflection, and how to teach about reflection and collaboration deliberately. We noted that we became more deliberate in our reflective practices. Teresa and I had participated in activities that included all of the foregoing experiences, and more. We had even done a joint presentation for the Virginia Society for Technology in Education conference, a conference sponsored every year to enhance the role of technology in schools.

Therefore, we felt as if we had established patterns of communication that allowed us to work well as a partnership of a researcher and a public school teacher. We had endeavored to adhere to guidelines such as those noted by Magliaro and Shambaugh (1999). They noted, "Our efforts have been to improve communication with and between teachers, learn from teachers, set the stage for sustained teacher reflection and examination, and develop habits of systematic inquiry" (p. 8). Therefore, Teresa and I felt that we had established the type of equitable relationship that makes for good partnerships. Our collaborations worked in the manner as noted by Erickson (1989), "Collaboration means working together in ways that exchange mutual help" (p. 431). We had reflected, and we had collaborated so that we might design the best electronic portfolio project we could at CATCE. A project in which the value of reflection and

collaboration was held in such high regard that we included it as a learning activity for the students.

Portfolios. The actions we took, and dynamics that developed over the span of time we engaged in the project have been noted previously via a list of eight conclusions we established for Phase One; I then noted observations about the evolution of this list for Phase Two. Therefore, the format stated in the introduction and used in Phase Two will be used here but in a condensed form. Each conclusion from Phase One and Phase Two is repeated and then additional information is added based on the work done in Phase Three.

1. PowerPoint™ was used throughout all three phases of the study.

2. The technology used throughout all three phases were the computers, a scanner and digital cameras. The technology use increased as we went through the phases. Initially I did most of the digitizing, then Teresa did the digitizing and eventually the students did the digitizing of their work.

3. It was necessary, in Phase One, for students to sacrifice their recreation time in order to work on the portfolios. The electronic portfolio project was scheduled into the regular day for all of the students during Phase Two and Phase Three. Students often seemed to relate to the meaning they found in their creative efforts, display their enthusiasm and pride of accomplishment, and voluntarily stay after school to work on the electronic portfolios.

4. I would be the instructor, in Phase One, and this would be done via demonstration and practice. Teresa became the instructor in Phase Two, and her technological expertise continued to grow. We were committed to Teresa doing all of the instruction, in Phase Three, while I observed.

5. Teresa would be a co-participant in Phase One. Teresa's two responsibilities would be to analyze the process so that the electronic portfolio project could be incorporated into the regular school day when we began the actual project, and, secondly, to learn the technology along with the students. These responsibilities continued for Teresa in Phase Two, but her primary role changed to lead instructor. This provided more "hands-on" practice for her. Teresa was the sole instructor in Phase Three. It became necessary for me to

assist her, however, during the final week of observations. We had collaborated on this decision and found it necessary in order for the students to complete their electronic portfolios prior to the end of the school year. This was in response to the students' desire to complete their projects and potential for disappointment had they not finished their electronic portfolios.

6. The style of portfolios chosen to be used in all three phases of the study were Showcase Portfolios.

7. Reflection was a valued component of the process in Phase One, and was required of the students. There was a greater understanding and enhanced appreciation of reflection, in Phase Two, and more prompts were developed to help the students write their reflections and understand the process. The evolution of the reflective process, in Phase Three became significantly important part of the electronic portfolio project was significant. New understandings and meanings pertaining to the value and use of reflection were constant. Reflection had many educational advantages as had been noted in the literature. Boud, Keog, and Walker (1985) state, "Reflection in the context of learning is a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations" (p. 19). We observed all of the students come to varying levels of mastery of the practice as it related to their electronic portfolios in Phase One and Phase Two, however, and found in Phase Three reflection was an essential component of the overall process. Worcester (1998) notes that portfolios should provide opportunity for reflection and those actual pieces or documents should each be accompanied by an explanation of the assignment and a reflection sheet (p. 3). There was growth in the students' reflective practices, but often their comments about any given artifact reflected Teresa's voice versus their own because of her prompts, and an urgency to complete the electronic portfolios. The student reflections centered mainly about the artifacts they had chosen for their electronic portfolios. The liberal degree of freedom the students had in choosing artifacts for the portfolio appeared to enhance both meaning and

written reflections. The literature notes that the collection of the artifacts should be driven mainly by the student; it should be bottom-up, reflective, intrinsic and meaningful, thus, motivational. Engel (1996) states, "Portfolios allow children to express themselves. Even if students are told what artifacts that are to be used, in the reflection portion the students can tell why they did the artifact as they did" (p. 25). Danielson and Abrutyn (1997) state that, "Such an opportunity for meaningful synthesis is rare in school. Students will become more skilled as they have more chances to do such work" (p. 17).

8. Twelve of the twenty-eight students in Teresa's class were invited to participate in Phase One. All of the students in Teresa's class developed electronic portfolios in Phase Two and Three.

Chapter Five

Realities and Recommendations

This chapter identifies the realities of the study in regards to the two research questions. Recommendations considered for collaboration and the implementation of portfolios are also included.

Various types of portfolios were discussed in the literature review: the working portfolio, or a holding tank for artifacts (Danielson & Abrutyn, 1997); cross-discipline portfolios, or collections of work from subject areas over the course of a term (Seidel, et al., 1997); or the process portfolio which documents the learning process experienced by a student throughout the year (Seely, 1994). We selected the showcase portfolio for the project. Danielson and Abrutyn (1997) noted this style of portfolio to probably be the most rewarding of student portfolios because it displays the students' best work and makes them proud. "Students become most committed to the process when they experience the joy of exhibiting their best work and interpreting its meaning" (p. 3). This was important because we found this was true in all of the phases of the study although we sometimes reflected on the fine distinctions between the various types of portfolios. We also found that the showcase portfolio was a good model to be used for electronic portfolios because we did not wish to store all of the students' work from a term, or a subject, only the best work that proved meaningful to the student. Hawisher and Selfe (1997) noted that an electronic portfolio differs from its paper cousin primarily in that the portfolio materials are created in a digitized form. Therefore, the students in this study chose the work that could be digitized, as well as, artifacts that had meaning for them. We found that the combination of showcase portfolios being created in an electronic format worked well together.

Engel (1996) states, "Portfolios can capture and reveal significant aspects of personal meaning. Portfolios can be products of the, active, creative, energetic, imaginative, constructive, meaning-making minds of children" (p. 25). Teresa wanted the students to have the opportunity to choose meaningful artifacts. She used an analogy that seemed to work well as a means to convey freedom of choice to the students. She emphasized the personal nature of the artifacts and told the students to consider their electronic portfolio a story that would have a beginning, middle, and end. These three

story positions, elements represented the three slides the students were required to create for their portfolios. Next, she told the students that each slide should represent the person they considered themselves to be. This was explained further by noting that although the options for the students might include playground apparatus, they should consider the apparatus that appealed to them, personally.

In addition, the professionalism they wished to convey should be reflected by the quality of their product. She reminded the students of these instructions throughout the project and also encouraged them to have fun, be creative, use animation and colors they preferred, and "tweak" your images, etc. The students appeared to respond positively to this style of ongoing instruction and to be motivated by the personally meaningful connections with their artifacts.

The freedom for individualization was problematic for Teresa, however. She understood the value of choice, but she was accustomed to a lecture, teacher-centered mode of instruction. She had expressed her preference for keeping the entire class working on the same lesson simultaneously and the convenience this brought to her various record keeping obligations. There were also other obstacles and inconveniences. The May 21st observation was significant, however, and indicated the possibilities for the implementation of any new process, particularly electronic portfolios. Teresa appeared to have achieved a notable degree of automaticity that had not been observed to this point. There were a variety of instructional requirements pertaining to the electronic portfolios ongoing in the classroom, with different students, all at the once, and Teresa was managing it well. Her reactions to the demands made her new skills evident. She used new terms that reflected her technological expertise, her technological skills seemed to match her language, and she talked about reflections and prompted the students to be creative, imaginative, neat, professional, and constructive. As she moved about the room she worked with students on reflection, editing, buttons, and invisible buttons, scanning, the Playground Project, the House Project, rotating photos, saving folders, saving other images, inserting pictures, the Blue Card Routine, PhotoDeluxe™, backgrounds, storyboards, and adding color, etc. The implications important of this observation were that Teresa had evolved in her practice. Her mastery of technology was greater than it had been at the outset of our collaboration; she understood the value of reflection and

meaning making activities; the students responded well to the individual nature of their work; and she was able to manage an electronic portfolio classroom. I had helped Teresa, and she had informed her practice in many ways that were being transferred to her students.

In retrospect, this appeared to be an excellent collaboration between a researcher and public school teacher. And, in the present era of technological innovation that creates an ever-changing need for keeping pace with technological advancements such collaborations seem productive and worthwhile. Hawisher and Selfe (1997) state, "The new technologies never stand still. They are constantly changing and as such require continuous learning on the part of teachers and students" (p. 312). This collaboration between a researcher and a public school teacher that implemented the use of electronic portfolios appeared to be a productive means of satisfying the continuous educational needs for teachers and students.

Realities of the Study

This study was a journey to discover the dynamics that might emerge during collaborative efforts to implement electronic portfolios in a middle school setting. When the study began, there was not a complete appreciation for the multitude of issues that would emerge during the course of the project. Therefore, observations were made of occurrences that had not been predicted, or fully appreciated.

Collaboration. I was familiar with two experiences as they related to establishing a collaborative relationship with Teresa. First, my own classroom experiences and the experience I had gained as a local, county president of the Virginia Education Association had made me realize that there was a difference in the perceptions of the roles, duties, and goals of teachers versus those of university faculty. A teacher's existence was one that consisted of a broad range of real-world pedagogical circumstances that called for practical strategies. In contrast, the world of university faculty was much more theoretical, research-based, and elite.

The second experience that helped me to create a collaborative relationship with Teresa was the fact that I had read the literature (Kraus & Volk, 1997; Rudduck, 1992; Watson & Fullan, 1992) that confirmed the variations in the perceptions of a teacher versus those of university faculty. Therefore, I wanted to establish a meaningful

relationship that would enable Teresa and me to work as equals on a pedagogically practical project that would have meaning and lasting value for Teresa and for myself.

Opportunities for us to formally collaborate during this project took place in the form of reflective sessions when we met and discussed the status of the project. Lytle and Cochran-Smith (1990) note that teacher research should be, "systematic, intentional inquiry by teachers about their own school and classroom work" (p. 84). Therefore, we arranged for systematic and intentional times to reflect, and took advantage of spontaneous activities. These informal talks took place during the students' free time, lunch, Teresa's free time, and in between working with students.

Teresa reported that she had learned many things from our collaboration, i.e., an appreciation for the portfolio process; an understanding of the significance of reflection; the ability to use certain technologies and software; and an understanding of how she would incorporate technology into more areas of her teaching. The most important thing, however, was the feeling that she was much more comfortable using technology.

Our collaboration helped me to understand the use of electronic portfolios as an instructional tool was as active, exciting, and rewarding as I had anticipated them to be. Our talks helped me to understand the multi-disciplinary nature of the process and how each component was affected by the other components. The overall, comprehensive picture of management issues, the hardware, software, reflections, problem solving, collaboration, electronic portfolios, and the understanding of how the portfolio process might serve "any" curricular content came as the result of collaboration. Kraus and Volk (1997) noted, "This collaboration initiates new ways of thinking about teaching, and ultimately, of increasing collaboration with others. Collaboration is, thus, both process and product" (p. 76). I also felt that another product of the process was the symbiotic relationship that came from our collaboration. Sirotnik and Goodlad (1988) have noted that there needs to be sufficient selflessness on the part of each partner to assure the interests of all, or a symbiotic relationship" (p. 34).

We discussed the advantages and differences between direct instruction versus more reflective practices. Mastery of the basics was the goal, and Teresa expressed her understanding of how she could teach the basics more efficiently in a direct style. The mastery would then free the students to work independently and engage in the creative

endeavors, and to explore and develop even more advanced technological skills on their own. Thus, collaboration with Teresa made me realize that there were circumstances that called for direct instruction, and circumstances that were best served by the reflective aspects of the process. The use of the correct teaching style, at the correct time, evolved as being an advantageous dynamic for the portfolio process, and for the craft of teaching in general. Subjective matters such as the reflections were different, but not more desirable in all circumstances. Reflections and subjective assignments called for more depth, and our dialogue highlighted the value that we placed on the deeper understanding of things.

Implementing portfolios. The realities presented in this section are the major themes that developed from implementing portfolios. These included: management, reflection, and technology.

The management issues included the scheduling of people, time, scope-and-sequence, resources; assigning tasks; and directing students toward positive outcomes.

Teresa reported scheduling was one of her major concerns. The timeframes and scope-and-sequence that had been determined for Phase One and Phase Two were reconstructed for the Phase Three. It has been noted that I asked Teresa to identify the appropriate content sequence. She replied, "I think that it depends upon the knowledge of your children; that if they already know how to do PowerPoint™; if they are already familiar with the sequence of how slides work for a regular presentation then they are going to be familiar with the terminology. And so it is going to make sense to them to make some sort of slide show." She concluded that if the students have to "grapple" with the terminology, this would be reason enough not to begin with PowerPoint™. She noted that without the terminology students might not be able to see how all of the aspects of the portfolios are interconnected.

Therefore, the issue of prerequisite skills figured largely into the study. This was demonstrated during the study via the apparent variations in the students' prerequisite skills. The evidence surfaced at the outset of the rotation when it was noticed that individual students possessed varying skills. This variation in prerequisite skills continued throughout the study and had become apparent in both the reflection and the technological aspects of the project. It culminated when assignments were due and at the

end of the rotation when there would be students who had completed any given part of their portfolio versus students who needed more time to complete their portfolio.

Therefore, time, and timing had come to be a reality of the study. It was not the end of the school year when Phase One ended. This allowed students the opportunity to complete their portfolios at various times during the following rotation. It was the last rotation of the school year when Phase Three was conducted and this shifted the dynamics of the process. Further, Teresa did not have the time, or the opportunity to evaluate the students' readiness skills before the outset of the project. Nor, did she have the time or opportunity to make conclusions about the most efficient ways to structure the class. The variables that accounted for one of the groups standing out as being less motivated were not studied. It was noted that the group that was less motivated took longer to complete their work and needed more help to do so. Thus, adequate time to look further into the management issues of scheduling and timing became a reality of the study.

Reflection was identified as a basic component of the study, and similar realities that had been noted for the management component were found to exist for reflections. Primarily, time constraints as they related to reflections were noted once again; although, they were somewhat different in nature. First, Teresa emphasized the importance of the reflections, and she wanted the students to realize the significance of the reflections. Next, there was the matter of time that was required to teach the reflection process that was equaled, or surpassed by the amount of time it took for the students to do genuinely creative reflections. She told the students that, "Reflection is looking back at your work. It should tell what you have learned; it shows what you can do, feel proud of; what you would do next time; your feelings and thoughts; a good strong paragraph. … Reflection is where you write why you put the model you did in the portfolio, and then review and look back over the entire project. So, you will need to pause and think about what you have done, and why. You may say that the model is much harder, and these are some of the things I learned. … This morning you reviewed what you had done during the Playground Project. What you did is a part of what reflection is." Stone (1998) also alludes to this in the analysis of her study that students had difficulty writing reflections.

"Reflection is a process that needs to be nurtured and developed; it doesn't come easily to students" (p. 111).

Throughout the process Teresa noted as mentioned earlier that, "Getting them deeper is really hard. That's where I think that we probably need a tool." I suggested that she might use a rubric to get the depth she desired; something that would provide a prompt for the descriptive words Teresa thought would make the work better. After some deliberation, Teresa agreed that a rubric could be a very useful aid for prompting the students to think in more depth about their work. It should be noted here that Teresa admitted that she did not know enough about reflection and writing reflections to help the students.

In her work with preservice teachers on teaching them to write reflections Lyons (1998), indicated that:

> In brief, this work points to a needed, expanded concept of reflection to include 'making connections,' long strands of connections about teaching and student learning that take place over time and in critical, collaborative conversations with others – not as a solitary, individual enterprise (p. 118).

Teresa wanted the students to have a better experience with writing reflections and that time was required to teach the students how to do reflections, and how to "get deeper," as Teresa wanted. This emphasis placed on reflections denotes the amount of time that might be required to not only teach the students the creative processes, but writing skills, as well. It should be noted here that Teresa was not an English major or a language arts teacher. She had not studied the writing process in-depth. Further, this component of the project was carried out simultaneously with the technological aspects. Therefore, the lack of sufficient time to manage and implement all of the components of the study became a reality.

Time was a reality for the technology component of the study, as well. The efforts to coordinate the three major components of the study made it clear that whatever affected one component of the study affected the balance of the other two major components, also. Adequate periods of time for the implementation and completion of the various tasks stood out prominently as the dynamic that presented realities for each component individually, and collectively. Therefore, it was noted that reflection was only

one activity, but it required time to master it to the depths Teresa desired. The technology component on the other hand entailed many programs and operations, etc. that also required time to master. Among these were: basic computing, keyboarding, Word, PowerPoint™, the Internet, scanners, digital cameras, graphics, Clip Art, and PhotoDeluxe™, etc.

Teresa reported that the part she "hated the most" about implementing portfolios was helping each student with the technology. She stated, "It makes me work all of the time." Thus, it was established that the demand on her time for the technological component of the study was a significant consideration, and again, time emerged as a notable reality.   Time had not been considered a far-reaching element of the study, other than the scheduling and timeframes, Teresa had noted that she wanted to observe as a part of the management component. Just one example of the numerous activities noted in but one observation highlights the time requirements of the technological component. Teresa worked with the students on reflection, editing, models, buttons and invisible buttons, portfolios, scanning, the Playground Project, the House Project, rotating photos, saving, saving folders, inserting pictures, storyboards, the Blue Card Routine, PhotoDeluxe™, backgrounds, and adding color; all as they occurred simultaneously and consecutively.

Time was also a major consideration as it pertained to Teresa's mastery of the various technological aspects of the process. It was necessary for her to allocate time for her own study, practice, and mastery of many of the skills and operations previously mentioned. Sometimes, she and the students were studying and practicing the technologies in class, simultaneously. All of which highlighted the fact that there were perhaps identifiable courses of action for a teacher to consider regarding the best use of time as it pertained to the acquisition of technology skills, as well as, teaching them as they were learned. Atkinson (2000) in his study on implementing portfolios and learning to use technology used the analogy, "No one would get up on stage at a piano recital without having played the piece of music many times" (p. 102).

The element of time was also noted as it pertained to the immediacy that was observed in the students for mastering the technological skills necessary to create the portfolios. The suddenness of having to master many and varied skills in a brief period of time appeared to intimidate some of the students. Also, the sooner the students could

master the skills, the sooner they could become the independent type learners Teresa wished for them to be. It is as McKinney (1998) and Stone (1998) conclude in their research with preservice teachers, "Although time is clearly related to the learning of technology, it is also an issue with portfolios" (p. 98).

Time was reflected by Teresa's teaching style, also. As reported, this seemed to be a major consideration for the teacher and the student. The computer provided a clean and clear-cut way to get it right. Reflection on the other hand was much more elusive and somewhat exploratory. Therefore, the technological instruction was concrete and Teresa was noted to shift to her direct approach often during the technology instruction. This allowed her and the students to concretely comprehend the mastery of the various skills and operations that could be achieved in a timely manner.

Despite her often apparent direct teaching style that corresponded with the technological component she noted that learning takes time for all learners. She noted that she valued the need to grant the students leeway for freedom and choice as they proceeded through the process. But, she stated, "The goal is to get these three projects in place, get the buttons in place, demonstrate animation and sound if they are interested in that." Although she tried to complete the project in a very thoughtful and deliberate manner, the urgency to complete the various components and to get the portfolios done seemed to be a reoccurring dynamic. In reflecting back on any of the decisions that were considered, the need to complete projects often weighed heavily on the decisions that Teresa made as she was teaching. Therefore, the beginning and the end of any journey, project, or semester, etc. is determined by time just as the beginning and the end of every race, or any day. Teresa often appeared to be affected by the actual time it took to complete tasks versus the time she would like to have at her disposal. But others (Purnell & Hill, 1992; Raywid, 1993; Watts & Castle, 1992) have said that one of the most inadequate of all resources seems to be time.

It was determined that the time dilemmas were ongoing concerns, perhaps always tied to the individual characteristics of any group, teacher, or process. The reflection on the management issues led to the realization of the three major components of the study, and that time was an essential consideration of each component, as well as, the elements that made up those components. As such, time became a significant reality that prevented

repetitions of the process that would have allowed for the refinement of the scope and sequence; or the proper balance between the reflection and the technology aspects of the portfolio process. It was significant that these components and the realities were discovered because these matters can provide an advance notice to others who might wish to implement an electronic portfolio program. These variables continued to be matters for further study. These realities were presented in a format that was consistent with the major areas of concern that developed during the study: management, reflection, and technology.

As a side note, Teresa used portfolios for one year following the study. Teresa provided me a synopsis of that experience (see Appendix Q for Teresa's Continued Use Portfolios). She did so to share with me what she was still doing with portfolios.

Recommendations

Three sets of recommendations emerged from this study. One set focuses on the implementation of portfolios, the second focuses on recommendations for reflection/collaboration, and the third focuses on time for implementing electronic portfolios and for the reflective/collaborative process.

Implementing portfolios. CATCE was an excellent choice for this study in regards to the implementation of electronic portfolios. This major component of implementing electronic portfolios relied on the appropriate use of the technology. CATCE was an excellent site for implementing portfolios because there were at least 15 computers and a scanner in each module and digital cameras available when needed. I was fortunate to have access to CATCE and to Teresa, a motivated teacher who wanted to participate in the study. The following recommendations try to take into account the range of contextual issues that may mediate the successful implementation of electronic portfolios.

The first recommendation focuses on the software issue. Power Point™ was the primary software used for this study. Our rationale for choosing this software was that the students were already familiar with PowerPoint™ and in most cases the students had already used this product at school or at home. The choice to use PowerPoint™ and to allow the students to choose meaningful artifacts served to stimulate student interest and participation. There are other electronic portfolio shells available, i.e., HyperStudio™, Scholastic Portfolio™, Grady Profile™, Learning Quest's Electronic Portfolio™ or web

pages. I would recommend that if your school system supports, or your students know how to use these shells, templates, or software packages they be considered for electronic portfolios .

The second recommendation deals with prerequisite skills. We found, from this study, if students had been more familiar with basic computer skills, i.e., using a scanner and a digital camera, the implementation process would have been less frustrating for the students and for Teresa. If Teresa, herself, had the prerequisite skills necessary for implementing portfolios the teaching of the skills might have been more pleasurable, but she did not. Therefore, my recommendation would be to make sure that the instructor become competent themselves on the use of the technology that they wish to use in implementing electronic portfolios. I would recommend, for the students, two overview sessions for three or four students at a time. The first session would cover the use of the scanner and the digital camera, and the second would teach the students how to use buttons in PowerPoint™. I would then recommend that the directions for the scanner and the digital camera be posted near the scanner and the button directions be available in print when the students are ready to insert buttons.

Integration of electronic portfolios into the daily schedule and curriculum also emerged as an issue from this study. Teresa had to reorganize her daily schedule to allow for the implementation of electronic portfolios. I would recommend that others use the organizational chart Teresa and I developed, that shows our process of implementing electronic portfolios (see Appendix P for Organizing the Portfolio B). I would also recommend that the other artifacts found in the appendices of this study be used to help with the implementation of electronic portfolios. It is hoped that the use of these various activities and guidelines would be beneficial to all teachers who wish to incorporate electronic portfolios into their own managerial styles.

Showcase portfolios, whose primary feature is that they include the artifacts the students believe are their best works, were chosen for this study. I would recommend the use of showcase electronic portfolios because this type of portfolio allowed the students the freedom to choose the artifacts that they wanted to show off in their electronic portfolio. In this study, the use of showcase portfolios were more meaningful for the

students. The freedom to choose the content and the layout of the electronic portfolios served as positive reinforcement for the students.

   Collaboration/Reflection. Five recommendations are offered related to the collaborative/reflective process that Teresa and I participated in while implementing electronic portfolios.

   The first recommendation for creating collaborative arrangements between two participants would be to establish a clear understanding of the meanings attached to the term collaboration. Watson and Fullan (1992) have noted, "terminology is a crucial element as it pertains to the understanding of partnerships" (p. 215). Clark (1988) adds that one of the complications of this topic is that different terminology had been used to describe similar issues. Also, different meanings have been associated with the same term. "Authors speak of partnerships, collaborations, consortiums, networks, clusters, inter-organizational agreements, collectives, and cooperatives, frequently without definition and without distinguishing their chosen description from other possible terms" (p. 33). Mickleson, Kritek, Hedlund, and Kaufman (1988) have made similar comments. They state, "collaboration, cooperation, and partnership are terms that are often used synonymously in the literature when describing joint ventures between schools and universities" (p. 4). It is recommended that the first thing that partners would do when they are involved in a collaborative arrangement would be to discuss why they are meeting for collaborative/reflective sessions and what they want to accomplish from these sessions.

   The second recommendation would be to realize that collaboration is both a product and a process. Collaborative arrangements have also been reported to require a conceptual framework. Watson and Fullan (1992) suggested that, "a framework might consist of the context; the rationale; the structure; the focus; the process; and long-term goals beyond the partnership" (p. 220). I would recommend that the partners have a basic understanding of what goes into the process when starting a collaborative project. Investigating the literature regarding collaborative/reflective projects can do this. Once the partners have an understanding of the process I would recommend that the partners hold reflective sessions. In our case Teresa and I discussed what had been done during the previous few days of the implementation process with the students. We decided to

keep what had gone smoothly and changed those things that had not. Then we discussed what we would do in the next few sessions, thus a basic framework began to form.

The third recommendation relates to the significant research on the collaborative/reflective process. I would recommend that any institution or group that might be considering a partnership of any type thoroughly research and investigate all of the potentialities of their proposed partnership. Before the study began I gathered research on collaboration and reflection, and Teresa and I read over the literature so that we would have an understanding of our roles in the partnership.

The fourth recommendation relates to choosing partners. I would recommend that partners for any project be chosen wisely, either self chosen or appointed according to common goals. I was very fortunate to locate a teacher with two significant positive qualities. First, she was motivated by the project; therefore, her cooperation and willingness to disrupt her regular activities and have meetings following her regularly scheduled day were exceptional. In addition, we had a sufficient number of similar interests and other characteristics that allowed us to bond, and form a friendship that enhanced the process. I would recommend that if you find this type of person continue with the project, if not, continue to look for someone, or think about abandoning the project.

The study allowed me to understand that even though shared interests and cooperation were essential for a partnership to work, I also came to understand that differences were also necessary. Had my interests, talents, and strengths been the same as Teresa's, the elements of needing one another for resources the other had, and having knowledge and skills to share would have been diminished.

Lastly, the fifth recommendation conveys the importance of partners involved in a collaborative/reflective project be professional and honor all commitments. I would recommend that both partners understand the dynamics that are required to build trust and create productive relationships. Fortunately, Teresa and I found in each other someone who was committed to this collaborative/reflective project.

Time. The time dilemmas were ongoing concerns in both the implementation process and the collaborative/reflective sessions, in this study. Time became a significant reality that prevented repetitions of the implementation process. Repeating the process

would have allowed for the refinement of the scope and sequence of implementing electronic portfolios, plus time to reflect and collaborate on the implementation process. It was significant that this was discovered because this can provide an advance notice to others who might wish to implement electronic portfolios and/or participate in a collaborative/reflective process.

I would recommend that whomever wants to implement electronic portfolios understand at the outset that time constraints are a major factor. They should start small and build on what is learned each time the process is replicated. I would also recommend that that participants who want to implement portfolios that there is never enough time to do "perfect" electronic portfolios. Another recommendation would be to "make" time for reflection with an interested partner, on what has been accomplished and understand the process will become easier to handle and the outcomes will always improve.

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Appendix A

Calendar

	Monday		Tuesday	Wednesday	Thursday	Friday
	January					
	26	**I** 27	28	29	30	
	February					
	2	**R** 3	4	5	6	
	9	**W & R** 10	**W** 11	12	13	
	16	**R** 17	**W & R** 18	19	20	
	23	**WT** 24	**WT** 25	**WT** 26	27	
	March					
	2	**R** 3	4	**R** 5	6	
	9	**W & O & R** 10	11	**W & O** 12	13	
	16	**R** 17	**W** 18	19	20	
	April					
	20	21	**R** 22	23	24	
	27	**O** 28	29	30		
	May					
	4	**O & R** 5	**O** 6	7	8	
	O 11	12	13	14	15	
	18	**O** 19	20	**O** 21	22	
	25	**O** 26	**O** 27	**O & R** 28	29	
	June					
	O 1	**O** 2	**O** 3	**O** 4	5	

Phase One (January – February 23)
Phase Two (March – April)
Phase Three (April 20 – June)

Key

I = Interview with Teresa   W = Worked with Students
O = Observation of Teresa   R = Reflective Session with Teresa
WT = Worked with Technology

Appendix B

Portfolio References

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Appendix C

Coding of the Major Domains and the Component Categories

Reflection

- Pmt = Prompts are comments by the teacher wherein she attempts to stimulate student thought and reflection. Teresa seemed to develop a style of using questions as prompts.

- Q = Questions were often noted to be used as prompts for reflection.

- R = Reflection is deliberate thought as required from the students. It is an ongoing an integral focus of the overall process.

- Rw = Reflection/Writing differs from reflection in that it is normally of a brief nature, entailing the addition of a "sentence or two," work on a title, or other thoughtful items of a create and compose nature.

Management

- C = Choice is when students have been granted individual choice, freedom, or options versus direct orders and instruction. This was noted to be particularly evident when comparing the instruction that was provided for the technological aspects of the Electronic Portfolio Project versus the reflective aspects of the project.

- D = Direct behaviors by the teacher i.e., instruction, organization is the opposite of "Choice" as described above.

- I = Instruction has for the most part been either direct or reflective.

- M = Mechanics applies to the order and function of things; i.e., the proper location of the table of contents.

- O = Organization is very similar to mechanics, but it is also similar to order and discipline in the classroom.

- Rc = Reward/compliments are rewarding comments made by the teacher.

- R&R = Review and Revise are teacher directions/instructions.

- R&C = Review and Complete are teacher directions/instructions.

Technology

- CPC = Copy & Paste Create had been observed as a dynamic wherein the students often favor the prompts, variety, and ready-made nature of the

technological offerings such as clip-art. This has also been noted to offer an interesting comparison to original thought and composition.

- T = The technology aspect of the project.

Portfolios

- P = Portfolio refers to times when the central focus is the portfolio, itself, versus reflection, technology, or individual projects.
- Pr = Projects are individual in nature, and are works to be included in the portfolio.

Appendix D

Chronology

This appendix is written as a chronology of the15-weeks that I spent in Teresa's classroom. The study is reported in three phases. Each phase begins with a descriptive overview of Teresa and my discussions, observations and reflective sessions (see Appendix A for Calendar). This overview will be followed by a summary that addresses the research questions. The summary of the first phase describes the beginning of the journey into implementing portfolios. During this phase, which lasted three weeks, Teresa and I worked with a small number of students where I was the teacher and Teresa was the observer in all aspects of the implementation process. Phase Two begins to describe the changes in the teacher and researcher collaboration, Teresa's move into becoming more independent in her management of the implementation process, her becoming more familiar with helping the students with their reflections and use of the technology. Phase Three describes the six-week period in which Teresa takes full responsibility of the implementation process and where our reflective sessions are limited.

Teresa and I started this journey with the understanding that we did not know what lay before us. At the outset we knew that our collaboration and the implementation of electronic portfolios would be components of the project that would require our attention. It was our plan to study these dynamics, and refine them, so that other teachers might learn about them with a better understanding than where we started.

Phase One

The chronology of Phase One of this paper are written in a manner that attempts to demonstrate the willingness of Teresa and I to embark on a project that was completely new for both of us. We understood that we were making educated guesses and hypothesizing about the things and the manner in which they might emerge. Therefore, as experienced teachers and novice researchers, we planned to keep an open-mind to such events and incorporate flexibility into the procedure. Consequently, our experiences and decisions unfolded in the same manner as we lived them throughout the implementation process.

As was stated in the introduction I had been working with Teresa in her classroom for most of the school year. During this time I had been helping Teresa with the everyday classroom technology use (e.g., setting up her videoconferencing software, helping the students with Electric Library, an electronic reference database, helping students with Internet searches). We had decided at this point that we wanted to do something that would benefit the students and take them further in their technology expertise. Rather than just teaching them about the technology, we wanted them *using* the technology.

Based on an earlier conversation with the Instructional Technology coordinator, I had learned that the county wanted to implement portfolio assessment at the school. Moreover, Teresa had expressed a desire to have a different way to see what the students were learning in her module. So I asked Teresa if she would be willing to do electronic portfolios in her classroom in order to come up with an implementation process that might encourage the other teachers to also use portfolios. Time during the school day was already scheduled tightly so Teresa was somewhat concerned that she would have difficulty integrating electronic portfolios into the structure of her class. So, during this phase of the study I would do the implementation and Teresa would observe. Thus, Teresa and I began to define our roles in this collaborative process of implementing portfolios.

During the next five weeks Teresa and I met together for seven reflective sessions. I worked with the students on their portfolios or with the technology six times. The date and type of session in the following section will record these sessions.

January 27 -- Portfolio Discussion. At this meeting we spent two hours discussing what each of us knew about portfolios: the different types, uses and management requirements. We then talked about how the ideas of a paper and pencil portfolio could be generalized into an electronic portfolio. I had brought to the session several books and articles that I had collected regarding portfolios (see Appendix D for Portfolio References). We each took several of the books and articles with us to examine so that at our next meeting we could develop some guidelines as to an implementation process for developing portfolios for Teresa's students.

February 3 -- Reflective Session. Teresa and I met to discuss the books and articles that we had taken the previous week. We reviewed the different types of

portfolios, rubrics that were used to evaluate portfolios, possible contents, and the different types of technology used in electronic portfolios. In most of the books and articles we reviewed the authors stated to start simple; to not try to do all the concepts that were reviewed at once. So that is what Teresa and I did. We only talked about the types of artifacts that could be put into the portfolios based on the work the students did in class. We decided, for now, the electronic portfolio would be a "place" where the students could show off their work and write about what they had accomplished. In essence, we decided that the students would do a showcase portfolio.

The following questions emerged from our two discussions. These questions were selected because these were the easiest to deal with and were mentioned in the literature most often. These questions also dealt with management issues, which was Teresa's major concern in this process.

1.) How much time would be required to for the development of a portfolio?

2.) During what part of the day would the students be able to work on their portfolios?

3.) Would the software program Teresa selected lend itself to developing a portfolio?

Teresa felt comfortable asking me to work with her and a group of students on developing an electronic portfolio from the outset because of my role as a clinical faculty member at CATCE. I had already established myself as a person who was there to help teachers and students with technology. We decided that while I worked with the students on portfolios, Teresa would observe and learn about portfolios along with the students. She also planned to make notes that would help answer the above questions during her observation time so that we could further develop the implementation process.

February 10 – Worked with students. To go along with our decision on February 3 to start simple we invited 12 students from the class of 28 to participate in Phase One. Teresa selected these students based on a variety of criteria. But two central criteria were: 1.) students who were completing their work and were not behavior problems in the class; and 2.) students who were not normally included in extra activities. Teresa hoped that if they were asked to showcase their work this would motivate them to complete their assignments. In addition, one student was invited because Teresa felt that he was

artistic, but was failing to realize his potential. Thus, keeping with the second criterion mentioned above, it was determined that selecting this student for a special project might serve as both reward and motivation. There seemed to be potential for him to enjoy using an electronic portfolio to showcase his work from class.

I met with the 12 students, without Teresa being present, to explain that Mrs. Simmons and I were asking them to participate in Phase One for developing electronic portfolios for the students in the module. I explained to them that we would be using different technologies such as a digital camera and a scanner and that they would use PowerPoint™ as the application to develop their electronic portfolio. I also told them that they might need to miss their recreation time and stay after school to complete the portfolio. Out of the 12 students, 10 volunteered to do portfolios including the artistic student.

I worked with the students during their recreation time, which was also the teacher's planning period. Teresa observed, taking notes, during the first meeting with the students. I led a discussion of the definition of a portfolio, "its potential contents", and sample portfolios. The sample portfolios included portfolios that I found on the Internet and a design portfolio borrowed from Sherry, Teresa's co-teacher. The students and I developed a semantic web of all the activities that had occurred in the module thus far so they would have a visual representation of what they had available to showcase in their portfolio. Then they designed their own web on paper. Their assignment for the next session was to select artifacts for their portfolios from what they had already done in class. They were asked to make sure that those artifacts were at school so that they would be available to take pictures of or scan in the limited amount of time they had left in this rotation. This session went very well and the students left excited about the portfolios.

February 10 -- Reflective Session. Teresa and I met after school to reflect, and discuss the notes she had taken on what had occurred in class that day. Teresa felt that the meeting had gone well and that the students seemed interested in developing a portfolio. After observing the students work on their web she worried, "Several students may not understand in what order to put their artifacts. They may never have worked with PowerPoint™ to this extent and they may have trouble seeing the portfolio develop." We discussed ways we could help the students organize their portfolio, and decided that at

the next meeting we would begin with a storyboard. This would help them envision their portfolios as linear, and visually give them a way to organize the PowerPoint™ slides in their minds. Teresa suggested the use of colored index cards to differentiate between the different parts of the portfolio.

Therefore, we had agreed that things were going well. Reflecting on the process proved beneficial, however, because we identified a need, then discovered a tool to help the students visualize their electronic profiles in a manner that would enhance the process. The idea that index cards of varying colors, then placed on a storyboard would represent the students' artifacts emerged from our reflections as an excellent strategy to help the students envision the final product.

February 11 -- Worked with students. I helped the students develop a storyboard while Teresa observed. She was still interested in management issues and how to master the technical and mechanical aspects of the creative process of the portfolio. The students were given the following directions on how to use the cards as tools to organize their portfolio.

- The title card would be the envelope that they would use to hold their index cards.
- The students were allowed to choose colors of their choice for the table of contents, projects, the artifacts for each project, and the reflection.
- The students were asked to write a paragraph explaining the reasons they selected the artifact on their reflection card. This paragraph was due at the next class meeting.

February 17 -- Reflective session. Teresa and I met after school. Teresa told me the students complained about having to write about why they selected the artifact that they did. Teresa noted that it was her belief that students, as a whole do not like to write, and mostly due to the fact that they do not have to write about themselves very often, she understood the complaint. We discussed how the students usually do not have to reflect on what they write. They are normally told to write on a subject and given specific instructions. I told Teresa that I would review the portfolios. Together we could then develop a form to stimulate reflections. This reflective form could be used if the students had difficulties writing a reflective paragraph.

It was decided that PowerPoint™ would be used as the main software application to construct the portfolios. Therefore, Teresa wanted the students to understand PowerPoint™'s capabilities. We planned for me to show them how to use the application at the next meeting with the students. I would demonstrate how they could link their slides to other slides within that presentation, other PowerPoint™ presentations, and Word documents that they had developed in class. I would then give them an opportunity to practice if they wanted.

By the end of this session Teresa and I had the beginnings of a process to begin implementing portfolios. During the reflective session Teresa and I mutually agreed upon ways to proceed. Teresa was beginning to feel comfortable with the process.

February 18 -- Worked with students. By the fourth meeting with the students, 4 students had dropped out of Phase One, leaving 6 students. Their reasons included missing their recreation time, the workload, the writing requirements, and motivation for the task. The only students who remained were those Teresa had previously identified as doing well in the class. Initially, Teresa intentionally selected students that represented a cross-section of students for Phase One. She predicted, from her experience, that the students who did well in class would probably remain with the project. By this she meant the students who had regular attendance, made good grades, completed their assignments, showed concern for their performance, and those who approached academic tasks with optimism. Her prediction had turned out to be the case.

During this meeting I took two and three students at a time and showed them the linking capabilities of the software application. I demonstrated how slides could be linked to other slides within that presentation, other PowerPoint™ presentations, and Word documents, etc., just as Teresa and I had planned. Most of the students already knew that this was possible, so little direct instruction had to take place. Thus, there was more time for the students to practice at their own pace.

February 18 -- Reflective Session. Teresa and I met after school to reflect on that day's session. The loss of forty percent, which is discussed in the previous description, of the students concerned us. Despite the loss, Teresa shared with me, "I am relieved that the implementation of the portfolios is going so well." She explained her optimism and noted that it was inevitable that there would be some dropouts for the reasons that have

been cited. We weighed the losses and decided that despite losing the students Teresa predicted we would lose, things were still going as planned. Looking toward the future, we noted that we now had a smaller group of students. We felt that the new teacher/student ratio would enhance the process. Further, we predicted that the students who remained would be more inclined to approach their tasks dutifully. We had settled into our respective areas of responsibilities. I provided the technological expertise and instruction while Teresa observed, learned, planned for the management issues, and took the responsibility for classroom management.

Teresa also reported that from observing and working with the students she saw how she could arrange time during the day for the students to work on their portfolios. She would do this by adding another rotation into her station work that the students would rotate through the half of the day they work with Teresa. Other stations include working with computerized Legos™, SimCity™, developing a career brochure, and a software program called County Dam.

Teresa's relief was offset by a time management concern. "The six-week period will be ending and I am not sure how I will be able to digitize the students' artifacts and get them ready to place in their portfolios." We agreed for Phase One I would digitize and manipulate the remaining artifacts and have them ready for the students when they needed them.

We then looked at the statements and worksheets that I had found to stimulate reflective thinking. The ones that seemed most appropriate for our group, considering their age and interests mainly, were chosen as examples. One of the models was copied directly from a book we had on portfolios (see Appendix E for Two Stars and a Wish), and one was created based on reflection sheets from other books (see Appendix F for Reflecting on Your Work).

We concluded that we regretted the fact that forty percent of the students had decided to dropout of the project, but we understood the advantages of this happening, also. Further, the arrangement of the groups seemed to be finalized, and Teresa had come to an understanding of how she planned to manage the class. We had also developed handouts to assist the students, and we did feel as if things were going well.

February 24, 25 and 26 – Worked with Technology. During the fifth week of Phase One the students worked on their portfolios independently at times suggested by the teacher. I spent my time taking digital pictures, and scanning and modifying artifacts that the students wanted to place in their portfolios. Because of this there was no time for me to observe the students working on their portfolios.

This was one of those times when you begin to think about whether or not anyone would finish. The students took the stress much better than Teresa or me. She tried to shift work around in the students' rotations so that they would finish, I was hurriedly taking the students artifacts and getting them digitized. It was as if nothing would work right and at times we would take two steps backwards for every step forward. Teresa not only tried to get the students to finish their portfolios but they had other work to finish up also. But all in all it was pleasant to watch the students' portfolios take shape.

March 3 -- Reflective Session. At this last reflective session of Phase One Teresa and I noted that the following observations from Phase One were the ones that had frequently come to our attention.

- Even though the portfolios were taking up time from other instructional activities, and other station work Teresa had used in previous classes, she felt that the skills the students were gaining from the portfolio experience were as equally important. These included organizational skills, writing skills, and developing creative skills. The students were also learning to use the technology that is outlined in the Virginia Standards of Learning (SOLs) and other English SOLs (see Appendix G for English Standards of Learning that can be met by Implementing Portfolios).

- From our observations we determined that the students had a good working knowledge of PowerPoint™ and that this application lent itself to portfolio development.

- And lastly, even with the short period of time, of the six students who remained, three of them completed their portfolios. The other three would have opportunities to finish their portfolios in their remaining time at CATCE. Then, those who completed their portfolios had the option of adding to their portfolios as the semester progressed.

Phase Two

Teresa and I used the next six-week rotation as Phase Two so that Teresa could have more time to weave the portfolios into her instruction. During this time Teresa took over the implementation process, directing the students how to do portfolios, managing the classroom, and dealing with reflection. I continued to deal with the technology issues, digitizing the artifacts by using the digital camera and scanner, which went into developing the portfolios. By this time I had spent six weeks in Teresa's classroom. Our relationship at this point was more trusting and we were both feeling comfortable with our roles in the implementation process. It was getting to the place where I could read Teresa's mind as to when she wanted to change direction in class as to what she was doing or when a student may need some attention that she was able to give at the moment.

March 5 -- Reflective Session. Teresa and I began this second rotation with a meeting after school where we discussed what the changes we would make with the new group of students in regards in the construction of electronic portfolios. We decided that all students would begin a portfolio and then choose if they wanted to continue doing a portfolio. It was decided that we would give the students an unlimited amount of time to make this decision. Students were given a choice because we were still working our way through the portfolio process and Teresa was still working her way through the reorganization of her instruction. She knew the students enjoyed the other station work and felt comfortable with the students gaining knowledge of different software packages that an engineer or architect would use. With the new portfolio idea she did not want to have the students doing a portfolio if they were not entirely comfortable doing one.

After looking over the reflections the students wrote in their portfolios, for Phase One, Teresa noted that the students were not giving the information that she desired. She wanted more than "I learned to use a ruler." Or, "It was fun using WordArt in PowerPoint™." So for this next phase she wanted to concentrate more effort on reflection. One of the things that we decided would help was to have the students keep a journal. We thought that the reflection sheets used in Phase One did not get the students to think and reflect deep enough so we decided that open-ended statements might elicit better responses. We went back to the reflection sheets and used some of the language

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that was used there and developed a list of eighteen open-ended statements and questions (see Appendix H for Open Ended Statements and Questions to use for your Journal). The journal would consist of a folder with brads with the students using their own notebook paper. The Instructional Coordinator provided the folders. The reflection sheet would be placed at the beginning of the folder. We decided that the students would begin work on their portfolios the second week of this six-week rotation. This would give students time to get comfortable in the module, time to learn the routine, and have some work completed to put into their portfolio.

During this meeting Teresa and I discussed what she would do with the students in the first week of doing portfolios. We decided that on the first day she would do an introduction of electronic portfolios: what an electronic portfolio was and why students should develop a portfolio. Teresa would then lead a discussion on reflection: what the students knew about reflection, and why she wanted the students to do reflective writing in her class. In her words, she wanted the students to do reflective writing because she wanted their input on into what was happening in the module and that this would be a way of eliciting this information. Teresa was particularly concerned about determining if the students enjoyed the projects, completed during the six-weeks and whether they saw that the projects related to each other. On day two and three of this first week Teresa would actually have the students do a journal entry.

By the time that Teresa would be into day four of the electronic portfolio implementation, the students would have completed their Playground Projects with Sherry. The Playground Project consisted of a front and top elevation of a playground the students themselves had designed, a written recommendation of good playground safety, which had been researched using the Internet, and a 3-D model of the student designed playground. To gather student input on what they had learned in designing a playground, we decided that Teresa would discuss with the students what they had done in the Playground Project and the different artifacts that came out of this work. During this discussion the students would brainstorm what they had done and Teresa would prompt the students to see if they made connections. She would then have them do a journal entry on what they had learned from this project.

In order to minimize student questions about portfolios Teresa would take time to discuss with the students whether or not they wanted to continue with the portfolios. She also wanted to make sure that their questions had been answered in regards to the portfolio project. We determined that we would still emphasize that all the students should do a portfolio, however, if they did not want to continue, they could withdraw and work on other station work.

Teresa was still struggling with how she was going to help the students keep the portfolio organized. In Phase One the students developed a web of all the projects they had done so far and chose artifacts from those projects to go into their portfolio. They had also used envelopes to keep their index cards in a somewhat organized fashion. We agreed that the envelopes worked with the students at this point. But knowing how eighth grade students lose things, I suggested we try storyboards with the students after they had finished the Theme Park project, which occurred after the Playground Project. Teresa agreed that this would give the students an opportunity to see all of their cards in a sequential way and that they may be less confused about what their portfolio was beginning to look like. With the cards being taped to the big sheets of paper, this would hopefully keep the students from loosing their cards.

From Phase One Teresa and I learned that allowing the students to pick their own color scheme for their cards was a mistake. Students could not remember what card was for what so, to keep the students organized, Teresa and I decided to use the following color scheme:

- Purple was for the product card where the students would do a card for the artifact they chose from the Playground Project. On each of these product cards Teresa would have the students write the name of the product and whether or not they would want to use this product in their portfolio. To begin the reflection process Teresa wanted the students to list a reason why they wanted to use this product in their portfolio.
- Pink for the Theme Park project
- Green for the I-75 project
- Yellow for Career Exploration
- Blue for the House design project, and

- All the reflections would be done with white cards.

As the students progressed through the six-weeks for each project they would have a project title card (i.e. Playground), a heading card for the project (i.e. three-D playground) with the name of the project they used, and a reflection card. We also decided that I would write up directions for manipulating pictures from the digital camera and directions for using the scanner (see Appendix I for Directions).

It can certainly be noted here that Teresa and I have come a long way in implementing portfolios. Teresa is beginning to understand how much time is required to implement portfolios, when the students will work on their portfolios, and how best to motivate them to reflect on what they have done. I am beginning to take less of a role in the classroom and more of outside consultant for the technology.

March 10 – Observation. The first day that I observed Teresa working with the students was Day 4 of the rotation which was after they had finished the Playground Project and they were getting ready to begin discussion about the electronic portfolio. During the morning session with 15 of the students, Teresa was able to discuss the parts of the portfolio, and introduced the idea of the 4 cards for the Playground Project and putting the cards in an envelope. She explained to the students that the front of the envelope would be considered the title card and the back would represent their ending slide. The four cards inside would represent the four products of the Playground Project. She directed the students to indicate on the back whether or not they would use this product in their portfolio. She also had the students write a journal entry, which was: "What do you know about portfolios? What do you find confusing about portfolios?

In the afternoon session with the other 15 students Teresa did the same lecture except she added, "That the journal is a tool for communication for me and that you [students] should not assume that anyone knows anything--give as many details as possible." This was significant because Teresa was beginning to see the value of the students' voices in the way that she instructed the class.

As with any repeated lesson, there is hope that the second session would be better than the first. This was the case with Teresa and her overview of electronic portfolios. In the second session Teresa did the following to improve the clarity of the lesson. She informed the students, "That the purposes of the portfolio were to document what you

have done, show what you have to done to support your grade, and show what you have done at CATCE."

Also in this session to help the students decide what they wanted to put in their portfolios she had the students brainstorm what they had done in the Playground Project rather than tell them as she did in the morning session. The students came up with written recommendations, watercolor rendering, top/front elevations and their model. She also redid her assignment for their journal reflection using an open-ended approach (see Figure 2).

First journal entry:

       The purpose of the portfolio is _____. I think the portfolio will be _____ because _____. The questions I have about portfolios are: (list out)

Second journal entry:

       1.) One thing that made an impression on me or a new technique that I learned, and 2.) One thing that I would change about the slides.

Third journal entry:

       Write one thing that you liked best from each person's slides, and what advice could you give that person about their slides?

       Fourth journal entry:

       How will the best set of slides influence the way you make slides?

Figure 2. Evolution of Reflective Prompts

Teresa then gave the students examples of the questions, which had been expressed in the morning session. These examples were: How much work will I have to do? What do you really mean by portfolio? How long will it take to do the portfolio?

Knowing that I would not be available as extensively during this rotation as I was in Phase One, I showed one student who has extensive technology knowledge how to use the scanner. It was my hope that this student would help Teresa out with the digitizing

and manipulating the artifacts. It turned out that this student was very successful in helping Teresa and the other students get their artifacts ready to go into their portfolios.

As was noted in the last session Teresa is becoming more and more confident in her management of the issues surrounding the portfolio process. It can be seen that she is able to determine when something is not going the way she wants it to by her changing her directions, review of portfolios, and being more in-tuned to the students' voices. She herself is beginning to reflect on what she did from session to session. She understands that to get what she wants out of the students she herself needs to understand what she wants in the portfolio. This is definitely beginning to take shape in her mind and actions.

March 10 -- Reflective Session. I began this reflective session by asking Teresa how she thought the four-day progression had gone. She replied that she felt that the students were right on schedule and that laying out the days really helped her plan what she needed to accomplish. We discussed the fact that we allowed students make a choice in regards to doing a portfolio or not doing a portfolio and leaving it open for the students to quit at anytime. It was decided that for the next rotation that the students would have to make a choice by the second week. The students who were not working on their portfolios would return to their regular station work. From this discussion I was seeing that Teresa was beginning to get a procedural organization going in her head as to how this process might work.

We then continued in laying out what Teresa would accomplish in regards to the electronic portfolio for the next few days. On day five the students would begin to use PowerPoint™ and do their first and last slide. Teresa would show examples from the last rotation so that the students would get an idea of what a portfolio looked like since many of the students had never seen an electronic portfolio. She would also go over questions and answers in that the students had written in their journal entries.

For day six the students would present their two slides to each other and do a journal entry so the students could learn from one another ideas to use for their own slides.

The reader can certainly see that Teresa and I have come a long in developing an organizational scheme for working with portfolios. Our reflective sessions have taken on a tone of knowing what we are doing rather than "Okay, let's try it and see if it works"

attitude. Teresa is becoming more and more comfortable with the management issues. This could also be due to the fact that this group of eighth graders are more mature due to it being the last semester of their eighth grade year.

March 12—Observation. Teresa went over the guidelines for journals with the morning group so that they would be able to do their journal entry for this day. Teresa explained to the students that they would be viewing each other's slides to get ideas for their own slides and to give input to the other students' feedback about their slides. This rotation would involve each student loading their slides onto a computer and the students would visit each computer and view the slides. While they were doing this observation they were to complete the second journal entry using the established template (see Figure 2).

After writing these entries Teresa wanted the students to send a memo to each student with feedback based on the questions noted above. This activity turned out to be a complete disaster. Students did not know others' names and there were too many pieces of paper to manage. The biggest problem was that the activity had no meaning for the students. From my fieldnotes it was observed that the students were not looking at the slides and were just writing anything down on the slips of paper. The students wrote such things as, "The color is nice", "Too many words are used", or "I don't like this one."

In the afternoon group Teresa made a drastic change. She decided to have the students work in groups of four so that they could get to know each other and the activity would be less chaotic. The students observed only those slides from their group and then did the third journal entry. Teresa then had the four groups each choose the best set of four slides and then these four portfolios were shown to the whole group. The entire group then did their fourth journal entry. The students were much more involved with this activity than the previous group. Since they were in groups they were talking with each other and took the assignment seriously.

From observing Teresa, I believe that she is beginning to listen to what we have been talking about in our reflective sessions. For the students to be able to reflect on what they are doing they are going to have to talk about what they are doing. Students do not have much chance to do this in most classes and with the change that Teresa made in the afternoon she gave the students an opportunity to discuss among each other what they

liked and did not like. They had to participate. In the earlier session the students did not have to participate, they knew no one would know what they had written and they wouldn't have to share. With the second group they knew up front what was expected of them and they rose to the occasion.

March 17 -- Reflective Session. Teresa and I had now been working together on the portfolios for two months. We had gone through several iterations of different aspects of the portfolio and had spent many hours discussing portfolios. I decided that I wanted to know when and how Teresa's interest in portfolios began. Teresa became interested in portfolios when she became a member of the county alternative assessment committee. She believed that the committee would be looking at alternative assessment for all content areas where the students would be given an opportunity to express their knowledge gained through multiple avenues. But the main focus of the committee turned out to be in developing a writing rubric for all grade levels. This rubric was a top-down assessment tool where the students were told exactly what was to be in their writing portfolios.

Teresa began experimenting with doing portfolios in her Social Studies classroom along with a writing portfolio. The only example that she had to use was the top-down writing portfolio. Because she felt constrained by this type of assessment and because of the conflict on how she wanted to assess the students, and how she was required to assess the students she wasn't doing a good job at either endeavor. She eventually gave up on her own student-centered portfolios as well as the writing portfolios.

We then reflected on what occurred at the last few meetings with the students. Teresa informed me that after completing the last question from day six the students wanted to immediately revise their slide. Teresa felt that she was neglecting the other station work that she wanted the students to complete. So she decided that she would not do portfolios for a few days so that she could figure out how to coordinate the management of including the electronic portfolios into the workstations. She realized that she was going to have to give up something and she wanted time to figure out what that would be. We decided that when I was able to be at CATCE during Phase Two that I would help with reflection and the technology, while Teresa reorganized the module.

It was good that we had this time in Phase Two for Teresa to step back and analyze what she needed to do. As was stated in the Methodology, Teresa's plans were to do five projects and the portfolios. She was trying to do too much in a little bit of time. I knew she felt the portfolios were important and Teresa was beginning to realize that she couldn't do it all.

March 18 -- Worked with students. During this day I mainly worked with those students who were ready to work on their reflections. Teresa was busy helping the other students with their portfolios or other station work.

One student in particular was ready to begin writing a reflection that accompanied the one artifact that was in her portfolio. This student, who is very bright, told me that she did not know where to start and did not know what to do in regards to writing a reflection. I gave her the following scenario: I told her to think about what she would say to me as a teacher if I had given her a grade on an artifact, based on the rubric for that particular assignment, and that she did not agree with the grade. I then told her to think about how she would defend the grade that she thought she should get.

The student and I discussed some of the points about the artifact that she liked and enjoyed doing. I jotted the ideas down and then gave the student my notes and told her there was the beginning to her reflection. I later saw her get a Thesaurus to use to vary her words.

Another student was ready to work on some technology issues with his portfolio so he took me through his portfolio, showed me what he wanted to do in regards to adding a picture of his playground model. I showed him how to take pictures of his model with the digital camera. After he took several photos we then went to the computer that was used to download photos from the camera. The software was also on this computer that was used to manipulate photos. We downloaded the photos into the computer using the camera and scanner directions that I had developed to help Teresa and the students manipulate photos. I then walked the student through the steps of manipulating the photo he wanted to use, and saving it to the models' folder that had been created on the server to hold their photos. We then went back to his computer where he was working on his portfolio and added the picture to the appropriate slide.

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I then worked with a third student who had not had as much experience with PowerPoint™, and was not as enthusiastic as some of the other students. When I asked him if he wanted to insert some animation or clipart into the slide we were working on, he really did not want to but he also confessed that he did not know what to do. We then went back and looked at some of the other students' portfolios and I showed him what other students were doing and if he was interested in trying some of these things. He reluctantly agreed and said that he would work independently on his portfolio.

I then worked with all three of these students helping them put their storyboards together and explained to them about using buttons. I explained to them that they were now going to begin putting buttons onto their index cards that were on their storyboards and that buttons were used to navigate through the portfolio. I told them that when someone wanted to view their portfolio they may only want to view certain parts of their portfolio or that they may not want to look at all the artifacts maybe only the playground section. The buttons would allow the viewer to start from the Table of Contents card which was their homecard and that the viewer could navigate from that card to any portion of their portfolio. Two of the students worked together on their buttons and I spent the remainder of the session working with the reluctant student.

This rotation lasted another four weeks. During this time I was not in Teresa's classroom or in contact with Teresa except for a couple of emails. These emails involved Teresa's progress with the portfolio process. They were short in nature and I did not get a real feeling for what she was doing. One email at the end of the six weeks did indicate that all the students did go through the portfolio process and the majority of them completed their portfolios. We met again the last week of the rotation to discuss what she had learned during this rotation and the course we wanted to take for the last rotation. This reflective session will be covered in the next phase; it begins our discussion of what we wanted to accomplish in the last six weeks.

Phase Three

This part of the study was in a more deliberate and sophisticated fashion than was Phase One or Phase Two. The crucial difference was that I was an observer in the classroom for the entire six-weeks. I observed, took notes, and made audio-tapes of the sessions while Teresa worked with the students. By this time trust had been established

between us and we were having truly reflective sessions and working collaboratively. One of the goals of this phase was to look at the dynamics that developed due to individualized characteristics as previously mentioned (e.g., readiness skills, intrinsic motivation, and aptitude in the two groups of new students that were involved in this rotation). This provided an interesting comparison in the implementation process and is described when appropriate as it emerged during the study.

Based on the data gathered during Phase One and Phase Two Teresa and I decided that there were some changes that we wanted to make to the organization of the process of implementing electronic portfolios. We wanted to reconstruct our process and communicate our modifications clearly before the six-week rotation begun, when Teresa would be totally on her own. We had developed an outline of what we had done during Phase One and Phase Two (see Appendix J for Organizing the Portfolio A). This list was also rewritten because we were to present at the annual Virginia Society and Technology in Education Conference on the implementation process.

Teresa had an overall plan of what she hoped to accomplish from day to day. But as the students progressed through the implementation process and are working on different parts of this process Teresa took her cue from the students as to what would be accomplished in class.

April 22 -- Reflective Session. We decided to meet after school to begin our reflective sessions on what had been done and what needed to be changed for the upcoming rotation. This initial session revealed a number of insightful developments. Significant items of note were the fact that Teresa was in the beginning stages of her own understanding and use of electronic portfolios in the classroom. Moreover, she was beginning to articulate her attitude that learning takes time for all learners. She conveyed this attitude to the students by granting them ample leeway for freedom and choice as they proceeded through the activities. Teresa allowed the students to choose the artifacts that would go into the portfolio as well as choose the appearance of the portfolio with the attributes allowed in PowerPoint™. While, at the same time, adhering to the sound guidelines that we had discussed early on in our sharing of portfolio materials for the creation of electronic portfolios. What became evident was that this was emerging as a learning process for teacher, student, and researcher alike.

Teresa noted in our first reflective session that she wanted to start this rotation by introducing the portfolios as a concept; or, a process and a product, and how this related to journals. The journal writing was an activity she had planned for the students in order to get student feedback regarding their opinions of the various aspects of the Engineering and Architecture Module. Teresa wanted to begin documenting the students' reactions to her teaching and the curriculum that had been planned for the module by stating, "I want to know how they feel about what we are doing in the module. To see how they think they progress through the work that has been designed to help them see what it would be like to be an architect or an engineer."

Teresa explained that she would instruct the students to write in their journals by telling them to, "Record their thoughts and feeling about what occurred as they worked through the different projects and activities during the six weeks." She then would lead a discussion of the significance of the journal process. She added that on the first day of the new rotation, she would demonstrate an example of an electronic portfolio that had been done during Phase One so the students could see what one looked like. "And then we'll talk about journals ... and how they're used in the workplace, and even though it may not be called a journal, there's documentation that goes on in the workplace and how it corresponds. And then we'll talk about the different ways they may have written journals in the past in the classrooms and kind of draw on what they know already. And then we will probably start the journal entry in the reflection of our conversation of the portfolio and journals in general." Next, she made other comments that led me to understand that she had a definite plan to use strategies that would attempt to make journals and reflections a meaningful activity. Further, she demonstrated that she had contemplated multiple ways in which she had planned to communicate the journals and reflections activities. Thus, by having multiple ways of expressing what was essentially the same content about journals and reflections Teresa had planned to express herself in various fashions in order to create meaning for as many of the students as possible.

Having outlined the mechanics of the beginning steps of the portfolio Teresa next explained the degree of freedom and choice offered to the students. "All students will do a journal. And all students will do a portfolio at the beginning. And after a week of work we'll do an assessment of where they are, what they've done, and how they're feeling

about that. And then we'll discuss the advantages of doing the portfolio. And then I'll let the students decide if they want to continue or not will be their choice." Therefore, it appeared that Teresa also planned to employ freedom of choice as a technique that would make the process a meaningful one, which would also add the component of individualization for the students.

Next, Teresa emphasized the personal nature of the portfolio; another way to communicate customization and meaning. She stated how she would instruct the students to consider the portfolio as a story, "You have to have a beginning and an end no matter what the story is." She noted that the beginning and the end slides would be the first slides to be created, "And this is where they get to be creative and they get to let it be kind of a slide that represents who they are as a person. And they can kind of put the colors they want and the animation they want, and they can kind of tweak with that and really have a little fun. And then we're going to start building after they've gotten the beginning and the end."

Following this explanation of how she planned to involve the students in their own story she returned to the mechanics of the portfolio. Having the organized structure she knew where she wanted to go. She noted that she would tell the students that the electronic portfolio would begin with three slides: 1) the cover slide which introduces the reader to the person who is making the portfolio; 2.) a card representing the artifact from the first project; and 3) an end slide which would let the student and the reader know that the slideshow would end at this point. Teresa wanted the students to develop these three slides so that she could evaluate how well they knew PowerPoint™ and the different software options. I asked if she could clarify her repeated use of the term slide and the software she used. She stated that the students at CATCE are, "very familiar with PowerPoint™. … And they will start by making an index card, which will be on their storyboard for each slide they plan to put into their PowerPoint™ slide show, which in turn will become a PowerPoint™ portfolio ... or an electronic portfolio."

Teresa then noted that the index cards would serve as a rough draft or a storyboard. She noted that by the end of the project a student might have as many as 30 slides and that this number of slides could become very confusing for the students. And,

explaining further she said that in the beginning the index cards, "may look just like six cards in a row, but as they add to it, it will become a story, or a storyboard.

Next, Teresa told me that the first project would be the Playground Project. In the preliminary stage of this activity they will be working in journals, recording information on their index cards, and creating rough drafts in preparation for the PowerPoint™ slides. Teresa said, "By the time it's all said and done it's probably five class days before they have six cards together and can make a decision about choosing to continue with the portfolio, or not." And, lastly, Teresa noted that the part she hates the most due to the individualized nature of the assignment is that, "It makes me work all of the time."

Teresa had come a long way in her thinking about portfolios over the last nine weeks. Teresa appeared to have learned a great deal about the potential uses of technology in the classroom as well as mastering the mechanical functions and operations, as well. Not only that, her vocabulary seemed to be changing, too. The sum total of these observations seemed to materialize a new found confidence I had begun to see evolve in Teresa. And, importantly, the familiarity and confidence Teresa was gaining appeared to have an effect on her enthusiasm for using technology in the classroom.

It needs to be noted that drawbacks in the implementation process continued to persist, however. This occurred to me as being the norm for any classroom innovation. And, as the process emerged I noted that the management issues were tied to the pedagogical issues of learning and teaching the technology and the electronic portfolio process. Apparently, a more homogeneous group would have enhanced the process. This was not the case, however. I came to understand that diversity is more often the rule in educational settings.

April 28 – Observation. On this day Teresa introduced electronic portfolios to half of the class (15 students) for approximately an hour. She defined an electronic portfolio, and its various components: the title page, table of contents, reflections, etc., and the various steps that would be entailed in developing a portfolio, the students seemed overwhelmed. The immediacy of mastering the technological skills necessary to create the portfolio appeared to intimidate some of the students. Even though the students had exposure to PowerPoint™ they were now being confronted with the terminology

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associated with PowerPoint™: graphics, pulldown menus, slides, buttons, linear formats, Clip Art, storyboards, and an assortment of other perhaps new and confusing terms and functions which were suddenly at their command. Teresa's reply to one student who asked, "How do you get started?" was to say, "Play around with PowerPoint™;" which I assumed was a deliberate choice of words intended to encourage the students to get their hands on the machines, and make them feel comfortable using the computers. Then, the students were told to go work at their own computer stations to begin working on their portfolios. Teresa set about moving from one student's station, which were arranged in pods with three computers in each pod, to the next giving them individual attention, "Do you know how to put graphics in? … "Insert; Go to Clip Art; pick Clip Art; insert and it is there."

Teresa spent the remainder of the class time responding to students' questions and requests which ranged from, "How do I save?... Can I do this on a PC?… to, How do I see my slides?" And, in addition to the technology there were questions about the cover page, the table of contents, and the Playground Project, which she had discussed earlier in her introduction. To further demonstrate the experimental tone Teresa was creating by allowing students to "play around" she told one student who had asked about the table of contents, "You don't need an actual table of contents. You just need to make a card labeled table of contents."

Thus, it became apparent in this session that there is a great deal for the students and Teresa to learn in producing a portfolio. Also, a wide range of skills exist among the students, Teresa understands the aforementioned instructional tasks set before her, and that she is using a non-threatening approach to entice the students.

May 5 – Observation. Since the introduction of the portfolio five days earlier it was noticeable that the students had made a significant amount of progress. Two major achievements were noted. First, most of the students were working independently of Teresa's guidance and instruction. The students were working at their computers alone and not asking many questions. Second, many students had progressed to the point where they were helping their classmates whenever they needed assistance with a task. The second observation reflects a significant amount of progress in terms of the accomplishments and artifacts that had accumulated in the students' portfolios.

This progress seemed to be accompanied by Teresa's evolving instructional structure and style. She found it necessary to balance her instructional time between three efforts. First, there was the "organization" of class i.e., "What have you done in the Playground Project? ... Now you need to add more slides. … Add words to your Playground Card. … We will work on your reflection later. … Please turn around and work at your station," etc. In other words Teresa's comments and dialogue seemed to come under an organizational category of comments that were of a direct nature that prompted the student to action. This differs from the "mechanical" comments I observed which were noted to be in response to student questions, and other dialogue of explanation and reminders of what is required, and where it is required to be located in the portfolio. The third category that I noted was instruction, both instruction of new material as well as information that has not been rehearsed to a great deal. Most of this dialogue was focused on the technology.

Two other things of note that took place on this day were the facts that despite having worked extensively in their journals, many students still needed help with reflections. Also, Teresa clearly emphasized the fact that the portfolios were to be done in a neat and professional manner. She told the students, "What makes it a neat and professional job? Combine being proud of it plus 'what I learned'." Therefore, Teresa was repeatedly making two points to the students. The first was the importance of the reflections, and the second was the importance of doing their reflections and other assignments "neat and professionally."

Time was consumed by miscellaneous duties, all of which seem to be categorized by one of the three categories that have been described. The organizational aspects included assigning tasks, and directing students toward outcomes. The observations of a mechanical nature included reminding students of how the storyboard was to be done, and the organization of the portfolio. The instructional efforts continued to be focused on the technological requirements.

May 5 -- Reflective Session. Teresa and I discussed the status of the students' work, the efficiency of the procedural guidelines, and what changes that might be needed that we had discussed in our last reflective session. We shared the same opinions about the status of the project. Teresa noted that, "I have been able to discuss portfolios with the

children in more detail. We've defined portfolios, the means of organization for their work and how they feel about this work, trying to get them to reflect more and being proud of their portfolios."

This statement was corroborated by Teresa's conversation with one of her students wherein she noted, "He described his work as being neat and professional." Teresa added that she suggested that he go back and look in his journal as to why his assignment met the criteria of being neat and professional. She noted that he also wrote that he was proud of his work. She continued by suggesting that, "he combine being proud of his work, with what he learned from the assignment, and what he would do over again." Therefore, Teresa is continuing to reinforce the same expectations of the students. She reported that the prompts and the reinforcement were effective.

I told Teresa she had done a very good job of getting the students to reflect more, as well as getting the students to understand the concept of reflection by reinforcing their good writing. This could be illustrated in a quote that Teresa made to a student, "So this was real good, your answer is what we call reflection." Teresa responded with, "So I'm getting better, huh?" And I said, "Yeah. Yeah. And they're getting better because you're getting better."

Next, we discussed Teresa's showing of a less complex example of a portfolio, with less creativity in the first three cards, in her introduction for this rotation rather than the more complex portfolios (one that had animation) which had been used in Phase Two. Teresa noted that she had changed because the students, in the previous rotation, were spending too much time on the "busyness" of the portfolio. Teresa said that all of the animation and graphics were taking time that needed to be used on more content and depth. I agreed with her and added that the previous students seemed to be working a whole lot, but in actuality time was being wasted, as Teresa noted, on "junk". Teresa noted, "As the students begin tweaking their portfolios there will be time to show them the creative side; the animation and customization that will make the portfolio theirs."

We then discussed the quality of the reflections versus the quantity of the material we wanted to present, as well as, the degree of mastery we desired. We discussed the fact that this rotation was for six weeks. Therefore, would it be better to expose the students to more, and expect less of the "neatness and professionalism" Teresa had been requiring.

We determined that most of the students were doing a good job with PowerPoint™, and at this point in time as progress was made using the storyboard, the real need centered in individuals. With the students working on individualized projects; therefore, individualized attention, guidance, and instruction was needed. And, continuing with the analysis of the students' progress, and future plans, Teresa made a statement, which reflected new directions, which were made necessary by the limitations of time and resources. "I had to scrap several ideas we had discussed earlier because of SOL testing and fieldtrips. And so as they finished up other things we returned back to the portfolio, and we returned back to the storyboard concept, and they've been putting the storyboard together. And, I've been able to talk about those same issues, but on a smaller basis--one or two children at a time. I have been preparing my instruction based upon the needs of the children."

We then began to reflect on Teresa's use of a peer editing activity that she had developed (see Appendix K for Peer Editing Activity). This activity enabled the students to look at each other's work to get ideas about what they could do for their portfolio, as well as have the chance to evaluate each other's portfolios. With this activity each student opened their portfolio on a computer and the students then rotated around filling out a sheet for each portfolio and placing the sheet in a desk drawer. The first rotation the activity was a disaster. Teresa noted, "The second time I worked out a better rotation, and it appeared to work much better." I asked her to explain what was different.

Teresa noted that she had used the same rotation, but the significant difference as she noted was, "My control of it was smoother." She then noted how she had reorganized and arranged the process so that all of the students understood the predetermined order and sequence of tasks. She said, "And that way I could pan around and see who was finished and who wasn't. So I wasn't rushing people. When all of the drawers were closed we stood up, we shifted, we sat down, and the first thing we did was open the drawer. So it just had a little bit more of a 1, 2, 3." This indicated to me that things were becoming more routine for Teresa and the students.

In Phase Two we had used large pieces of bulletin board paper for the storyboard but had decided to switch to posterboard for this rotation because we felt it would be more durable. But, the posterboard was causing problems. I asked, "So the poster board

is not a good idea?" After gaining first-hand experience Teresa's opinion was that with smaller projects the posterboard works much better. Portfolios containing five or six different projects would require adjustments, however. She reported that adjustments to the size of the index cards and longer sheets of paper to place the index cards on would be a workable adaptation. Although, reservations remained about the depth in which projects might be covered.

Teresa also expressed her feelings about the slides. She had come to understand that the slides should be denoted by more than a title, which had been the case in Phase Two. Her new guideline was to have students add a couple of sentences of notation to further explain and support the title. Additionally, the title and the supporting sentences were to also support the overall theme of the project. This would be done for deeper understanding, as well as, so that others looking at the project would have insight to the project.

The students seemed to respond more positively to the project as we progressed through the rotation. Teresa noted that this was an exceptional occurrence. "It's the group," she said. She then reflected on the possibilities of giving extra credit for exceptional work, and again stated, "But I think that it's the group. I think that if you have just a handful that are meticulous, and want things to be precise, and have high standards, it spreads. ... I think this class seems to be very serious about their drawings, too."

This particular "group" was in the last few weeks of the eighth grade and had the experience of being at CATCE for 15 weeks. Therefore, their maturity and the related experiences they had gained while at CATCE were probably a factor in their interest, cooperation, and mastery of the requirements. But we also noted that other variables such as meaning, the medium, and mastery of the medium were now coming to fruition. We had planned for these dynamics to be effective, and as time had passed, we had reevaluated and reconstructed our own methodologies. Therefore, it might have been the group, as Teresa noted, but it appeared that refining the process was a factor, as well.

Teresa noted that, "Getting them deeper is really hard. That's where I think that we probably need a tool." I suggested that she might use a rubric to get the depth she desired; something that would provide a prompt for the descriptive words Teresa thought would make the work better. After some deliberation, Teresa agreed that a rubric could

be a very useful aid for prompting the students to think in more depth about their work. Using the other rubrics that were used in the module, Teresa and I reviewed them and matched them up with parts of the portfolio. We wrote up 11 statements that we felt were important for an outstanding portfolio and developed the rubric from those statements (see Appendix L for Associate Work Evaluation--Portfolio Evaluation).

May 6 – Observation. During this observation Teresa worked with 15 students on reflection, which continued to be a point of emphasis. I observed the afternoon session with a different group of 15 students who worked independently. These students had spent the morning with Sherry who had them write, in their journals, all the things that they learned while doing the Playground Project. It appeared that in addition to acquiring the technological skills necessary to construct an electronic portfolio, the students also needed to be taught how to reflect. Teresa announced there was a distinction between writing in a journal versus reflection, "Reflection is where you write why you put [what you did] in the [playground] model, and then review and look back over the entire project. So, you will need to pause and think about what you have done, and why. You may say that the model is much harder, and these are some of the things I learned. . . . This morning you reviewed what you had done during the Playground Project. What you did is a part of what reflection is. Throughout the process of putting together a portfolio you are going to be doing a lot of reflecting. So, what is reflection? What you have learned, looking back, reviewing. . . . A large part of portfolio work is looking back and thinking. . . . Your journal Friday will help you do a reflection for the drawing. You wrote about what you learned and thought about it."

In review, Teresa also told the students that the reasons for a portfolio were to, "Show and share with people what you have done, and to look back on what you have done." Hopefully with Teresa's guidance, reflection will become the element of the portfolio implementation process that will allow the student the ability to achieve this, as well as, bring meaning to the journal and various aspects of the electronic portfolio.

May 11, Morning – Observation. Teresa continued to move from student to student helping them and answering questions on whatever section of the implementation process they may be working. One of these sections continued to be reflection. During one of our informal interviews Teresa and I had discussed the improvement in the

students' writing since they had been doing the reflections. But Teresa shared with me that despite an ongoing emphasis on reflection, one student had asked her, "What is a reflection?" She answered in a manner consistent with her ongoing description of a reflection, "Reflection is looking back at your work. It should tell what you have learned; what shows you can do, feel proud of; what you would do next time; your feelings and thoughts; a good strong paragraph."

Then, after reminding the class that they needed to be working on buttons and the table of contents, Teresa gave assistance to a student at his station. She reviewed the procedures of adding buttons with him, referred him to his help sheet for buttons (see Appendix M for Button Symbols and Appendix N for Adding Buttons to a Slideshow), and said, "Try to do this on your own, and see if you can get them to work. Only way you can see if buttons work is in slide show."

She asked another student, "How are your buttons? . . . How about invisible buttons? . . . Look. Click and drag the box over the entire word. . . . See? . . . Now get your invisible buttons on, then go back to graphics. . . . You need to get all your buttons. Make sure they all work, and go where you want them to go."

Teresa then moved to help a student who needed assistance with the table of contents. The other students were busy working on their own projects. Teresa was busy managing the class; keeping them busy via one of the three dynamics as noted previously: management, technology and/or reflection. With this Teresa kept the students busy working on different components of the portfolio which met their individual needs based on were they each were in the portfolio process.

May 11, Afternoon – Observation. The contrast of class dynamics and skill levels were immediately observable in the afternoon. The students were having more difficulty with reflections. They were more complacent, wanting to sit and talk, play with clip art, and openly making statements such as, "I'm not really interested in doing this." And, compared with the on-task collaboration noted in the morning group, this group seemed mainly interested in socializing. One student even made a journal entry stating that he did not want to work on portfolios. Despite this, Teresa proceeded to work in the same style and manner that had been observed in the morning session. Considering the independent

nature of the project, she found it beneficial to group certain students with others, or move from student to student as quickly as possible.

The technology soon came into play and required Teresa to deal with the task of keeping order and teaching, simultaneously. One technique that Teresa used to manage her classroom was to have the students raise their hands when they wanted to work with the scanner or the digital camera. One student however kept getting up and coming to her saying, "I need to scan now." There was someone else using the scanner so Teresa told the student to have a seat and work on other parts of his portfolio. This student kept getting up and asking Teresa that he needed to work on the scanner and Teresa kept telling him to sit down. The student was persisted and argued on and off for 35 minutes while he sat at his computer station, before Teresa could resolve the issue. This appeared to be a prime example of how difficult it was for Teresa to teach and maintain order at the same time. Nevertheless, she appeared to do a good job of disciplining, and teaching students simultaneously.

But on the other hand some of the other students seemed to be progressing and enjoying developing their portfolios. This is reflected in the statement made by a student when asked, "How's it going?" he replied, "Cool!" Others were also observed to be enticed by the technology, and Teresa continued to maintain class with the organizational, mechanical, and instructional dynamics that had been noted in the earlier class.

May 19 – Observation. Teresa's classroom interactions continued to be categorized by me as being management, technology, and/or reflection. While observing Teresa I noted that students with fewer skills needed more organization in terms of direction and discipline. Most of the students were meeting the requirements of the project, and constructing average to better than average portfolios. I noted that these students required more instruction pertaining to the mechanical dynamics. They needed more rehearsal, time to practice, and reminders of previously discussed materials. The students who were doing exceptional work required more instruction. They were constantly breaking new ground, and needed to know where to go next. Therefore, the range of student abilities regarding their technological aptitudes were highlighted once

again, along with the resulting difficulty for Teresa to gear her instruction for the group. Instead, it was necessary for her to spend much of her time with individuals.

One student would need help from Teresa with buttons during one part of the session, then she had to be prepared to give assistance to another student with the storyboard at a later time during the same session. Teresa had been very observant of these changing roles and varying talents, and began to enlist the help of students on a more regular basis. Also, Teresa constantly shifted her activity from organizing, to prompting, to delivering instruction. Teresa had become more fluent and flexible by this point in the study.

While Teresa's ability at organizing, remediating, or instructing became smoother, the major topics she covered remained the same. She spent her time either calling students to order, going over things "one more time," or introducing new material. This bears reiteration because considering these three things Teresa spends her time shifting her priorities constantly throughout the day. Therefore, it appeared that this understanding would enhance future projects of a similar nature because the instructor would know at the outset that management, technology, and/or reflections would be three of the primary instructional concerns.

May 21 – Observation. As the rotation reached the midpoint the sessions continued at a fast pace. This session was observed to be a "busy" session. Many things happened simultaneously and consecutively as Teresa worked with the students on reflection, editing, models, buttons and invisible buttons, scanning, the Playground Project, the House Project, rotating photos, saving, saving folders, inserting pictures, storyboards, the Blue Card Routine, PhotoDeluxe, backgrounds, and adding color. Not only did she talk about all of these things, sometimes she talked about them two to three times, or more as made necessary by individual students. Even though these session were busy it seemed to be constructive busyness.

May 26 – Observation. Teresa spent the entire time of my observation working with three students. As they worked on their portfolios, the remainder of the class worked independently on other station work. This session revealed several things about the portfolio process. Perhaps the most significant of these findings was the true nature of the demands placed on the teacher as made necessary by the varying needs of the students as

they initiate a new classroom activity such as electronic portfolios (Danielson & Abrutyn, 1997; Hawisher & Selfe, 1997; Paris & Ayers, 1994; Paulson & Paulson, 1996; Wolf, 1996). I noted that several potential organizational refinements became apparent as a consequence of the exploration into this process. Highly notable among these refinements is Teresa's previously stated aim to allow the students choice and independence during the preparation process of the portfolios. This decision allows for student freedom; which is to say the freedom to choose from an array of activities, and thus also creating a class of students who are not always in sync with the same activity. This student independence and variation made it evident that Teresa needed to be more "directive" in order to balance the demands placed on her by the multi-faceted aspect of the portfolios. As students were working on different parts of the portfolio to meet their individual needs Teresa directed the students as to what they were to do instead of trying to pull out of them what they wanted to put into their portfolio. Therefore, it became evident that Teresa was discovering certain priorities, or the circumstances that allowed for student choice versus the circumstances when Teresa needed to be direct and request the students to work on the choices they had made. Apparently, even though the students were allowed to make choices, Teresa still needed to be in charge of the class.

Several incidents allowed the magnitude of the portfolio process to become clearer during this day. It seemed that certain "givens" could not be taken for granted when it came to the students' understanding of the portfolio's dynamics and processes. For example, "choice" is a freedom and/or responsibility that many students were not prepared to handle. Likewise, "reflection" seemed to be an activity, which was foreign to some students. Thus, various aspects of the process became increasingly evident as they emerged as problematic areas of the portfolio for the student to complete. Importantly, not only did they arise as problematic areas of completion, or tasks for the student, they also emerged as problematic components for the teacher. Therefore, the "needs and demands" of the students and the teacher, although different, had in a real sense become linked to one another, with each attempting to satisfy the needs of the other. Three important facts in this "bi-directional" teacher-student relationship came to my attention on this day: a) the problematic areas could be identified, b) the teacher needed to be directive whenever the varying demands of the students made it necessary, and c) the

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students' independence increased in a relative proportion to their mastery of the task at hand.

Teresa seemed most directive when it came to the technological aspects of the process. These aspects of the process could be identified as the components of the portfolio and the various technological skills needed to create the portfolio. The technological skills included basic keyboarding, scanners, digital cameras, PowerPoint™, and the Internet. An analysis of Teresa's dialogue supports this assertion, "OK, so you double clicked on it and there it is. . . . We need to plug the adapter down there into the outlet so we have power. . . . You might need to manipulate your photograph. . . . Well we are having a little trouble with the servers. . . . So now you need to go to modify. . . . We need to change this from a PhotoShop file to a PICT file. . . ."

It was necessary to note that the students also reviewed the mechanics of the portfolios, "So you want to go ahead and write a storyboard on that so you will remember, and then of course this will be a reflection on your storyboard. … OK? You need to write your reflections on your index cards as a rough draft first, and then we will write them on the slides. … You have been working on the House Project, right? So, we need to add this information to your portfolio … or to your storyboard first, and then to your portfolio. … OK, for the rest of the reflections we need to write the reflections on this card first as a rough draft and then type it in on your slide. ... OK, let's finish that up, then let's go get your drawing. ..."

In addition to the foregoing considerations, Teresa, and the students, also were concerned with the details of any, given specific activity, "And then you will need to write your reflection on your interview with Mr. "H" and then the reflection on Poplar Forest. And, you need to write them on the index cards first. Then we will come back and work on your slide show making new slides and putting titles on and things like that."

Thus, it was noted that multiple activities occurred simultaneously with students of varying needs; needs based on the task at-hand considering the students' varied and independent projects. Therefore, circumstances emerged that allowed for student choice, as well as, other circumstances that required direct instruction from the teacher. She appeared to continue to work toward the desired goal of student independence, however. She allowed students to work independently, and to allow students to help other students.

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She spent the majority of her time walking about and observing, and complimenting students on their projects. She gave direct instruction and requested students to work only when it was necessary. It appeared that the students were beginning to play a significant part as problem solvers, mentors, or aides.

It should be noted here that Teresa's direct instruction was somewhat different when she was helping with the technology versus times when helping with the students on reflection.When helping with the technology, giving directions was easy, or concrete. There was usually only one way to perform the required task and Teresa had the ability to perform the task, as well as, the ability to deliver the instructions to the students so that they could comprehend them. But, when working with reflection there were many options, many things that could be included in the reflection. Teresa was still struggling with a method of how to pull out of the students the things they needed to write for their reflections plus her own ideas of reflection.

May 27 -- Observation. Dynamics similar to those noted in the previous sessions emerged in the eighth observation, also. Teresa remained directive in her approach. In addition to previously noted statements regarding the circumstances wherein student choice and freedom were prudent versus the circumstances that called more direction from Teresa, another variable had emerged. It had become evident that the entirety of the material needed to be covered within a single, six-week grading period. This time restriction appeared to increase her "push," or drive and command of the classroom.

The analysis of the transcripts for this observation revealed that certain teacher behaviors (i.e., her directive style), and her emphasis on certain topics reoccurred time after time due to the students being at different places in the development of their portfolios, also. The topics that had been continually stressed by Teresa were: portfolios, reflection, an array of technological terms and tools, and management of the process. The significance of this is that repeated rehearsal of the same concepts tend to imply that the students, and teacher alike, improved their methods and enhanced their understanding of the newly initiated teaching methodology (such as the use of portfolios) with the development of automaticity and rountinization (Berliner, 1986). Many of Teresa's comments to this effect were chosen from this dialogue in order to display a concrete demonstration of her classroom command. These excerpts are representative of the entire

session, and representative of previous sessions, as well. This significant number of quotes helps to present a clearer understanding of her repeated classroom themes as they pertained to the portfolio assignment, as well as, her directive style.

"I need you to get your storyboard and come see me. … Click on the slide you want to put it in. … Remember the four areas you worked in, the four products that came out of the House Project. … And we need to get all of your reflections written first before we go back to the computer. … I can jump straight to the House Project by clicking-on that button. … Yeah, we will work on that after you get your reflection done. … You get your storyboard and meet me over there at the computer. … Your Interview Reflection needs to be about the interview with the person, what you learned from them, the interview process, if you interview someone again what you might do differently. … A completed portfolio is expected to be in here, and if you have a complete one it will help your grade. What you need to do is write-up your reflections. … Tell me what makes this stuff interesting. … But you are concentrating on Poplar Forest, not the bus drive, not the lunch, not a summary, but you need to attack one particular part of it."

The term reflection appeared 93 times in the transcription of this observation. The constant referral to the activity presented a powerful classroom effect. Reflection is something that Teresa is trying to stress with the students and it seems that the students just did not get the concept of reflection and what needed to be written to satisfy the reflection requirement. It could also be that Teresa is still not familiar enough with teaching the students how to write a good reflection so once again it needs to be emphasized that this is a learning experience for both Teresa and the students.

Notable changes came to the forefront at this session. Teresa appeared to be more flexible, and her directive teaching style changed. I concluded that this must be due to the fact that she could see that most of the students would finish their portfolios, and that working with the portfolios had become more automatic. She later confirmed these observations and told me that whether the students had finished, or not, it was time to move on. Thus, she was much more complimentary and apparently more willing to allow student choice. For example, one of her comments at the very beginning of this session was, "Very good, very good! Right on the money! Yeah!" Next, she moved directly to instructional dialogue with the same tone of enthusiasm.

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The teacher-student dialogue continued to be centered about the same topics as previously recorded i.e., portfolios, reflection, an array of technological terms and tools, and management. However, Teresa used a number of questions to prompt students to action and/or reflection versus her previously noted style of giving direct commands. At one point she used four questions in succession in order to prompt the entire class; more often, however, she used similar questions asked in independent format. The four-question succession was, "What did you learn while you were there? What were you impressed with? How do you feel about the house? If you took somebody back to see it again what would you make sure they saw that you found interesting?"

The establishment of a routine, as well as the enhanced understanding and knowledge of materials and procedures seemed to have contributed to Teresa's relaxed style. At the outset, through, my observations of Teresa indicated to me that she had to get the immediate gratification that a teacher receives from being in control. Now that the routine had been established, and the students were performing with a greater deal of automaticity, Teresa was visibly more comfortable with the process. My fieldnotes and reflective sessions corroborate of this analysis of what she was trying to do. She wanted the students to have control and be independent learners, and she also wanted to gain a complete understanding of the management and technological aspects of the project. She noted that she had been uneasy requiring the students to do things that she was not able to do herself. I also noted in my fieldnotes that we really got to know each other and this was confirmed in the reflective sessions.

Other factors that Teresa identified as possible contributors for her initial anxieties might have been her sense that she had a lot of material to cover, knowledge to impart, and artifacts to produce within a six-weeks' time. She understood that she had never done electronic portfolios prior to this semester, and that she could not imagine the unknowns. Thus, the inability to envision and understand final outcomes might have had created a certain degree of stress. Now that the end was in sight, however, she reported that not only did all seem to be going well, the processes and artifacts were evidently very pleasing. Thus, the process and the product had been rewarding, and the feeling of having so much to do had been resolved, which in turn alleviated Teresa's stress.

The remaining stress she appeared to feel regarding the students' completion of their portfolios surfaced on this day with a final reminder regarding accountability. She told the class, "A completed portfolio helps your grade. An incomplete portfolio hurts your grade. So, if you choose not to finish it, you need to realize it will affect your grade. But, if you finish it, it's going to do nothing but help you. I won't let it hurt your average. It will either leave it the same, or bring it up, depending upon what your average is. So, between now and next week we need to be finishing these things up. And, we have a couple of more things to add for a lot of you."

It appeared that Teresa had matters well in hand. She was gratified by the quality of the portfolios; she knew that all of the students had the opportunity and the means to complete all of the required materials prior to the end of the grading period; and she understood that the students were responding favorably to the project. Teresa's recognition of students' intrinsic motivation was evident by the way she had complimented individual students on their electronic portfolios. She wanted the entire class to complete all of the components of the portfolios, however, and she reminded the class that, "A lot of times what happens is everybody gets so excited about making buttons they forget to do the other stuff that's really important. … As soon as you get finished with your reflections, and you get all of your new slides made, then you are ready to make buttons. OK?"

Thus, the conclusion of this session seemed to demonstrate Teresa's continued emphasis on reflection, technology, and management. The fact that she was talking about the students being excited, combined with their classroom reactions, indicated that a favorable and contagious spirit in regards to the portfolios was present in the classroom. Additionally, she concluded her statement with a note of flexibility, "OK?" This was a change from previous days when she had not invited student feedback by using comments such as, "OK." She had been much more directive with students previously, making comments such as, "OK, let's finish that up, then let's go get your drawing," versus the tone she conveyed on May 27, "Let's finish that up, then let's go get your drawing, OK?" Therefore, I noted that "OK" was a term that Teresa had used often, but it appeared to make an observable difference in the messages conveyed to the students, depending on how and where she used the term within her sentences. When she used the

term to begin her sentences she appeared to be using it as a lead-in, or a phrase to get the students' attention. When she used the term as and ending of her sentences she seemed to be conveying a satisfied and friendly attitude. The latter was the way she had used the term previously.

May 28 – Observation. Teresa was observed working mainly with a group of students who had been having difficulty with their assignments. The difficulty arose from factors that ranged from absenteeism, to aptitude, to motivation, and even a student who Teresa described as a student who, "does not want to be in school." The session seemed to be a remedial session, and the most obvious of Teresa's adaptations to this group was her attention to individual students versus her usual focus on the entire class. The manner in which she used the more directive style of instruction in order to "bring the students up-to-speed," as she noted, was also evident. Among her many comments to this effect were, "Now "W" before you work on the computer you need to write your reflections on your index cards, your white cards. They need to be written on the storyboard. Do you need any help with that? … I need you to tell me what it is that you have learned. … "B," I gave you some specific instructions. … All right, leave "D" alone so she can work. … OK, finish that one. …"

It was also interesting to note that the teacher-student dynamics seemed to shift once Teresa's "directiveness" had gained the students' attention, which was followed by their apparent interest in the session. At such times when Teresa seemed to sense the students' cooperation, she appeared to relinquish some of her directiveness and was, thusly, able to be more complimentary of the students, "Good! Go ahead and get your storyboard. … Good! You will be an expert. … Oh! That looks pretty good!"

At this point it appeared that Teresa's direct instructional approach had worked well, and was perhaps necessary in order to bring "all" of the students to a level of technological competence. Once a certain level of technological competence was achieved the students were granted more freedoms and choices. Teresa maintained the same instructional basics throughout the instructional period--she was direct when the circumstances called for control, and she shifted to allow student freedom whenever appropriate; and the same instructional basics had been used regardless of students' individuality.

May 28 to June 4 -- The final week of observations. Teresa and I had continued to engage in our reflective discussions as the study progressed. But as this rotation came to a close, there was some urgency in getting the portfolios done because of time constraints and the impending close of the school year. This last week of the study shifted because Teresa made many of the decisions regarding the portfolios on a minute-to-minute basis. Some of the decisions were not ideal in accordance to the guidelines we had developed. However, they were decisions that adhered to our objective to be flexible and keep an open-mind. Therefore, as experienced teachers, Teresa and I both knew that the demands presented at the end of the school year can dictate the things that any teacher might need to do. Teresa did what she needed to do, and my role shifted somewhat. I sat next to the digital camera and scanner usually, and was called upon to occasionally engage in an instructional role.

May 28 – Reflective Session. The dynamics of the collaboration that had evolved between Teresa and myself became evident in this interview. It was logical to anticipate that a relationship might develop between any participant and researcher whom had collaborated on a study such as this. We were pleased to discover that we had developed a friendship as well as a productive working partnership. The give-and-take of our conversations was mutual and we found ourselves to be very accepting of one another. Numerous times in our conversations Teresa asked, "What do you think?" I replied, "Well, what do you think?" Teresa would then jokingly say, "You are the expert, you are the one getting your doctorate." I would counter with, "Your input is just as important in this research as mine." This dialogue led to discussions of who knew more, but it always ended the same way: We both respected what the other had brought to the collaborative effort.

It appeared that a great deal of trust had been established between Teresa and I. We would brainstorm, make suggestions, plan, create, and recreate the process without dispute. The discussions focused on the portfolios but we also asked about each other's families and personal things that each of us were going through in our lives. In reviewing the transcript there were several mentions of humor that naturally occurred between Teresa and me. For example, at one point in the interview I asked Teresa a question and she replied, "Aggghhhhh". I then ask her, "Could you elaborate on that?" At another

time, Teresa and I were going over the list of things that had been accomplished and when I asked Teresa about doing the peer evaluation she replied with, "What peer evaluation?" I said, "The one you made up earlier." With a laugh she replied, "Duh! I remember that." These are but a few of the examples of the humorous dialogue that transpired between us. From my perspective, they are representative of what I have noted to been a productive working relationship that extended into the realms of friendship.

We went back to the organization of the electronic portfolios that had been developed in our initial conversation of April 22 as part of this reflective session. We reviewed the process to this point, and discussed the steps that had been followed, and the extent to which they had been followed as planned. I checked the order of the development process, "Did we do the slides before the storyboard, or did we start out right with storyboard?" Teresa responded, "We went right into PowerPoint™." We recounted the discussions in which we reviewed the evolving process including: changing the number of cards the students began with, adding a key to the button handout, and adding a tip sheet on what should be in a portfolio slideshow (see Appendix O for Portfolio Slideshow Tips).

As we continued our conversation I wanted to recapture from Teresa why some of these changes had taken place. In regards to the storyboard she recalled that she had opted to alter the original plan of using the storyboard. She noted, "And I remember why we did that. They were so enthusiastic that we didn't want to damper the moment. We wanted to get right into PowerPoint™." There were a variety of reasons as to why Teresa changed her course when working with the portfolios but the majority of those were what Teresa recalls as, "gut decisions." She went on to explain, "I felt at the time because of the students or what was going on in the classroom that I needed to make the change." My observations and opinion of the shifts were that changes in planning have been noted as being productive whenever the circumstance demanded. This process had been no different from any other process, or classroom in that regard. Therefore, Teresa appeared to have made prudent decisions whenever factors such as mastery of the topic, or skill; student motivation; absenteeism; or availability of resources, etc., had called for a shift.

As I asked Teresa to identify the appropriate sequence of teaching the phases of the process she concluded that it would depend on the skill level of the student as to

whether to teach PowerPoint™ or storyboarding. She noted, "I think that it depends upon the knowledge of your children; that if they already know how to do PowerPoint™; if they are already familiar with the sequence of how slides work for a regular presentation then they are going to be familiar with the terminology. And so it is going to make sense to them to make some sort of slide show. And, it needs to have a beginning slide; and it needs to have a slide that serves as a table of contents." She concluded that if the students have to "grapple" with the terminology, this would be reason enough not to begin with PowerPoint™. She noted that without the terminology students might not be able to see how all of the aspects of the portfolios are interconnected. This could also be seen as a management issue depending on the time that was available to implement the portfolios.

At this point we discovered that as long as progress had been taking place, Teresa's sense of student interest and motivation had steered the course. She noted, "The goal is to get these three projects in place, get the buttons in place, demonstrate animation and sound if they are interested in that." Although she tried to do complete the project in a very thoughtful and deliberate manner, the urgency to complete the various components and to get the portfolios done seemed to be a reoccurring dynamic. In reflecting back on any of the decisions that were considered, the need to complete projects often weighed heavily on the decisions that Teresa made as she was teaching.

Then, we reviewed the entire implementation process; we considered the timeframes necessary to complete the various components of the project; then we rewrote this process so that it would be appropriate for future use (see Appendix P for Organizing the Portfolio B).

During the rewriting Teresa expressed two significant goals that seem to reflect her sense of commitment to the Electronic Portfolio Project. First, she talked about "planting the seeds" for these eighth-graders, who may return to CATCE for part of ninth-grade in the coming school year, so that they would continue to use the skills they had learned while working on their portfolios. She added that she had already talked with two students, who hoped to return, about continuing work that had been initiated this year in the coming year. She was heartened by the fact that, "That they are really excited about adding to their portfolios, especially if they can put it on a CD."

Secondly, Teresa, who will be teaching English to the returning ninth graders, noted, "Whoever I am working with next year (co-teacher) I think reflection will just be part of the lesson plan. We will use the journals from the get-go, and we will incorporate time to do the review at the end . . .. The journals, I hope, for the ninth-grade will take on an additional realm of reflection on reading and writing, as well as, their graphic type of work. So, it will be even more complicated."

Teresa then continued her reflection on the future, and how portfolios and reflection could be used as tools to facilitate curriculum integration. She noted, "that these same tools could be an effective way to aid students in the generalization of material and establish continuity from one grade level to the next, as well as, subject-to-subject." As such, she noted that helping students to see how things are "interconnected" would help them to prepare for their SOLs.

From this reflective session Teresa's belief in Electronic Portfolios as a beneficial instructional methodology were quite evident. Her enthusiasm during the session as she talked about extending and expanding the use of portfolios into other subject areas and grades was very genuine especially when she said, "I really think that I can make this work! If I can get the students to write in their journals I can see them being used for all sorts of purposes." Teresa used journals interchangeably with the word "reflection." She saw the journal writings to be the reflections that the students would use in their portfolios.

May 29 – Observation. With this observation certain events and patterns have become evident in regards to the process of implementing electronic portfolios. The overall goal or purpose of the session was to have all of the students complete their projects. Therefore, at this point in time some students were still trying to complete their project; some students were adding to their completed projects; some students were helping other students to complete their portfolio; and some students were working on other assignments. Teresa spent less time with the mechanical and organizational aspects of the process compared with previous rotations. The students had become adequately acquainted with these aspects so as to not require ongoing instruction, although they still needed occasional reminders.

Teresa spent more time with individual students working at the computer. This appeared to be decisions she had made in the interest of having all of the students complete their projects prior to the end of the rotation. Most of the students had their storyboards completed and were ready to use the computer. Much of the dialogue focused on technical skills, "If you right click on your mouse, you can end show on the bottom. So we need to go in the slide, so double click on that and we need to go up to slide show and go down to our action buttons and the invisible button is the custom button so click on it."

The previous dialogue illustrated the way that mastering the technological skills might be best achieved by direct instruction, and that this component of the process was a prerequisite to student independence. It also illustrated the way that the technology had reduced creativity in this endeavor. It could also be inserted here that this is Teresa's way of dealing with mastering the technological skills. The direct instruction underscored that many of the aspects of the process and the technology were concrete; specific commands produced definite products. Teresa seemed to understand this distinction as she went back and forth between different instructional approaches, depending on the circumstance. The portfolio parts and organization, and the required technology lent themselves to direct instruction, whereas the reflective aspects of the portfolio seemed to require more of a non-directive approach. This non-directive approach was noted when Teresa talked with one student regarding her reflection, "I need to know the focus of what you are talking about here. It needs to be about what you learned on this trip, things that provide me with more information. You may need to go back to the website to find out more information." Teresa was still trying to discover the correct prompts that would help the students write better reflections. She knew that the reflections needed to be written in the students' own voice, but she had difficulty getting them engaged in the writing process. Despite this dilemma and possible call for more of a directive approach, I observed that she tried to be as non-directive as possible.

This distinction is also apparent in the following excerpts from the transcriptions. Teresa seemed to manage the direct instruction with the technology quite well, but still struggled with the reflective aspects of the portfolio. As noted above she wanted the students to write about the topics they chose, but many of the students appeared to need

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significant degrees of guidance. Without the guidance, encouragement, and direction the students often appeared to be confused about the process of reflection. This called for an increased degree of direct instruction that Teresa wanted to avoid in the hope that the students would become independent. Idleness on the part of the students did require Teresa to be more direct than she wished to be, but she seemed to realize the circumstances that required her to take control over their writing.

The students also showed continual preference for the technology versus the reflection. (It should be noted here that Teresa was trying to balance her instruction between the technology and the reflections. It appeared that her shifts between direct instruction versus allowing the students to more choice might have caused confusion for the students.) They enjoyed the technology much more than writing their reflections. It seemed as if Teresa used the technology as a "carrot," as an enticement to get the students to finish their reflections. "How is it going for you? Did you get your pictures in? Good. Now which one are you working on? This one? OK, OK. On the tip sheet for text, items one and two limits the words and limits the lines. We are ignoring that for reflection slides because we don't want to cut reflections just to meet this criteria. … The reflection slide is important as far as giving us feedback on how they are reviewing your work and what they are learning from it. We don't want to curb any information they may have. … We are interested in what you have to say about your work. We are going to let those be as long as they need to be. OK? … Let's work on it. We need to get this reflection done. You get this reflection done, and this one done. This is what you should be doing before you work on the computer anymore." The comment, "you can work on the computer as soon as you finish your reflection," appeared 23 times in the transcripts of this phase of the study. Thus, indicating that Teresa realized that the students preferred the technological aspects versus the reflection, and that she used this as an inducement, or leverage to get the students to complete their reflections.

At this point students needed to be coaxed to do reflections. Teresa continued to wrestle with the amount of time that was required for reflections. She did not want to compromise the creativity of the reflective process, nor did she wish to compromise the mastery and creativity of the technological components of the portfolio. There was a limited period of time the students had left to finish their portfolios, however, and not

enough time to complete the project without Teresa being more direct. From observing her working with the students on reflection it seemed that Teresa wanted to make the process an academic endeavor through her concern that the students would not be able to finish their portfolios in the time remaining. This was reflected by her persistence for even the briefest of reflective thoughts. "You will also need to write one or two sentences on each of these slides about what it is we are looking at, like you did on that one. . . . Yeah, you need to put one or two sentences. . . . All right, maybe we need a concluding sentence here that either says, you know, that kind of sums that up, some way." And, with this last phrase of the statement, it can be seen that teaching students how to produce original thought can be as difficult as it is for a students to master reflection. The difficulty that original thought and composition presented for the student bears vigilance and guidance. This was made evident by Teresa's attempts to pry information from the students, "I need to know what that information is, specifically. What you learned this time that you didn't know before. . . . And, I need that specifically. . . . OK. When you get down here on the drafting reflection, you have got, 'The drafting was fun and the tools were neat.' I need to know specifically what made it fun. . . . Yes. You are too general. . . . We need something better than that. . . . It's boring to your reader if you start everything off, 'I learned this, I learned this.'"

In summary, there was a clear distinction in the teacher's instructional approach to technological aspects of the portfolios versus the reflective components. The technological instruction was concrete, whereas Teresa's efforts in her prompting for reflection were somewhat exploratory. Many of the students showed a preference for the technological requirements and required coaxing in order to complete their reflections. Teresa seemed at a loss to be able to concretely identify what she felt was an appropriate reflection. This was evidenced by her constant and often repeated request for the students to be more "specific" when they did their reflections. It was almost as if she did not know how to demonstrate, or communicate what an acceptable reflection might be, but she knew what a reflection that was lacking depth looked like. Therefore, her preferred manner of requesting more depth was to request the students to be more specific.

This seemed to be a major consideration for the teacher and the student. As addressed earlier in this section the computer provides a clean and clear-cut way to get it

right; whether learning it, or teaching it. Reflection on the other hand was much more elusive: Teresa was struggling with how one teaches reflection in a clear and sequential manner.

June 1 and June 2 – Observations. The purpose of these days continued to be the completion of the portfolios and had a tone of being "review and revise" sessions. I put these two sessions together because they show the differences in the two groups that were mentioned in the introduction. These sessions have been reported jointly because it highlights the portrayal of the differences that emerged among the two groups that had been randomly assigned.

As it turned out, the students who met with Teresa for the entire day on June 1 had either completed their portfolios, or only needed minor revisions. The June 2 group included the students who were noted in the May 28th session as having difficulties that ranged from absenteeism, questionable aptitude, to lack of motivation, and even a student who Teresa described as a student who, "does not want to be in school." Thus, these conditions provided for an interesting comparison.

Teresa seemed to be pleased as she reviewed the students' portfolios on June 1, and perhaps relieved to discover that the task had been manageable. There were times when she seemed to relax for the first time in the recent sessions and even joked and teased with the students. When she spoke to a student in regards to using a digital camera she quipped, "Yea, got to have some electricity, some juice, my grandmother used to say that. When the electricity would go off she would say, 'Well there is no juice down here, the electricity is off.'"

At this point Teresa was also complimenting the students more on their work, "That is cute." … "That is a nice reflection!" It appeared that Teresa used praise as a form of reinforcement to keep the students working even though the project had been completed. As I watched these students I noted that they wanted to display their portfolios for Teresa and their classmates. Further, they demonstrated an interest in the work of others. They even showed a certain competitive desire to complete their portfolios so as to reflect their individuality, and their exceptional pride in their piece of work. The sense of ownership seemed to be a significant motivating factor. As the students were completing their portfolios Teresa allowed them the opportunity to critique

each other's portfolios. "If you will go over to his machine and you go over to her machine, go through the portfolio and kind of grade it and write on the back of the rubric the things that she could do to improve it, to give her an inside perspective, to give her another view."

The foregoing statement, was directive, but it seemed to reflect Teresa's sense of accomplishment with this first group. The degree of completion achieved by the students and quality of the portfolios appeared to have eased the concerns Teresa had about a previously unknown process. The students had mastered the concepts to acceptable degrees of completion, and although it was necessary to redirect them to certain task from time-to-time, they did not need instruction from Teresa. When they did have a need for further instruction, classmates who had mastered all of the requirements and skills were available to help Teresa.

I noted that the dynamics that emerged with the second group that Teresa spent the day with on June 2 were somewhat different. Most of Teresa's time was spent reminding students of what they needed to complete, and when they needed to complete it. She asked one student, "Do you have your buttons in?" The student replied, "Well, some of them." Teresa asked, "Do you know how to do buttons?" "No," replied the student. "Here take the button sheet and I'll come over and help you," said Teresa. She told another student, "OK, you have forgotten how to do that? First you go back to the slide show, and you need to get that custom button, for the action, and do that custom button, and then see the cross-hair, you will be able to clicked and drag a little box over Playground Project." Thus, she began to demonstrate her direct style she had opted to use when remedial work was being done, or when there were schedules to meet.

Her attempts to get the students to have at least some semblance of a portfolio finished were apparent. "You are running out of time and if you don't have animation, that is fine." Teresa was even happy at this point that the students were borrowing and using each other's artifacts, and working on each other's portfolios. "You know C, that doesn't look like your project, is it? J, did you help C do this? Okay leave it, I just want you to get to work."

This observation led me to understand that many variables emerged during this project. It was my opinion that if Teresa replicated the same process, she would be more

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experienced and better prepared to serve all students. Further, Teresa would have a much more realistic understanding of the amount and the quality of work that could be expected from different individuals.

June 3 – Observation. The primary purpose of this session was to encourage and assist any student that had not finished their portfolio. As previously noted, more of a review and "wrap-it-up" tone was demonstrated in this session versus the previous sessions that seemed to be more like "review and revise" sessions. Teresa continually emphasized the fact that the deadline for the project was imminent, "But we need to wrap-up where you are ... We need to have the portfolios finished, and done, and over with by Thursday. … So it's very important that you spend some time making sure you get finished, and it looks the way you want it to, and it contains the information you want before you turn it in." Teresa's attempts to convey the need for urgency and thorough preparation seemed to cause the students to take the appropriate actions.

Teresa also introduced a new teaching aid during this observation. It was a general checklist and task completion sheet (see Appendix O for Portfolios Slideshow Tips). "We need to review the work you have done so far with this, this purple sheet, this general tip sheet. ... There is one more slide you need to add before you get ready for your final checklist. I am going to go ahead and give it to you." The significance of the newly added checklist seemed to be a continuation of previously noted checklists developed by Teresa. With the use of these checklists, an understanding of the process and other skills, have helped her become more automatic in her instruction was evident. "So you need to read through the slide show tips and you need to think about how it relates to your slide show". . . "Are all your buttons done? Do you need to use the button sheet to help you?" This can also be seen as Teresa became more procedural and mechanistic.

Reflections continued to be an ongoing area of concern. Teresa had developed a repertoire of prompts to inspire and guide the students' compositions. Repeatedly, she would ask the students to write about, "things you have learned; what you enjoyed; things you didn't like; what types of work you saw being done; more about the interview; what were the good things, what were the bad; how did you feel about that; you need to elaborate on that; and what impressed you, etc." Still, despite all of the prompting the

students needed continual guidance and instruction, "Include another couple of sentences, right here. … Tell me more about the interview. … OK. So, let's work on that one a little bit more. … Tell me what's disappointing about it," etc.

Thus, this session seemed to be a "review and wrap-it-up" period with a strong emphasis on the fact that the time to display the Electronic Portfolios was quickly arriving. And, as a consequence of the repeated rehearsal of the instructional processes and other concepts, the students had acquired the skills and knowledge necessary for independent action. This seemed to free the students to work toward the completion of their portfolios, and also free the teacher to help individual students as necessary. Teresa was able to take the time to work with students on their backgrounds and fonts. "Make sure that you don't have a really dark background. … All the animation and all the slides come in at one time. … You have to have a minimum of fifteen slides, do you?"

This day had gone well, however. Teresa told me that she thought that allowing the students to do the same things "tomorrow" (June 4) as they had done "today" (June 3) was an excellent idea. Her rationale seemed sound. All of the students had been involved in productive activities; each student who had completed their portfolios had chosen another activity that pleased them, whether that be continuing to work on their portfolios, helping peers complete their project, or helping with other "last day of school" chores. Teresa noted that these activities had engaged the students in orderly and productive behaviors, and that it would be a "great accomplishment" if the same plan would work as well on the final day of school.

June 4 – Observation. This observation took place on the last day the students would spend in the classroom for this school year, and my final day of observations. Teresa had already informed me that she had decided to allow the students who had not finished their portfolios to have "one" last day (opportunity) in order to complete them. Therefore, the purpose of the last day of school emerged to be the same as it had been on June 3. This last observation was focused on getting all of the students to complete their portfolios.

The students did not work in groups. The entire class had been combined for the entire day. Therefore they were not alternating AM and PM sessions. The students worked individually on whatever needed to be accomplished. The main goals were

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task completion, time management, and getting Teresa's room cleaned for the summer. The session appeared to validate the fact that the overall process for implementing the electronic portfolios in this classroom setting had become a routine. Teresa and the students seemed very aware of the methods, content material, technology, and procedures. Teresa no longer had to be as concerned with the management and delivery of instruction as she was at the outset. Instead, most of the students had progressed to a level of understanding and operational skills, which allowed them to be independent learners. This was evidenced by Teresa's interactions with the students who desired outcomes versus constant and direct instruction. To address individual student needs, Teresa used various prompts. As noted throughout the chronology of this study Teresa had created and used various prompts. It seemed that she had now rehearsed which circumstances called for which prompts to the point of achieving automaticity when she used her prompts. First, she referred students to the checklist so the students could check the status of their own work, and responded accordingly. "It tells you to skip to step 9 to change the color of a button and step 10 to change line, and it tells you to do the customs buttons. … "Have you used the portfolios slide tips to make sure that you have done everything? That purple sheet right there, have you used that for each slide?"

The transcripts and fieldnotes for this session also indicated the reasons for denoting it as a "review and get-it-finished" session. This personality was evident in Teresa's dialogue. "But it does need to be finished today. OK? … You can continue to work on your portfolio. You may have as much time as you need today to get it finished, but it does need to be finished today. …You will have time for your books and your friends tomorrow. … Where are you on this list [which step]? … All right. Your time is running out. You are going to be doing this instead of other things. … You need to do that checklist, and look at your show, and check it off. " I noted in my fieldnotes that the students were scattered around the room helping each other; working on their own; with Teresa walking around directing and helping everyone. There were even times when she was working with Sherry; helping the students to finish the work they needed to get done for Sherry.

Teresa used the checklist that seemed to have simplified the chore of classroom management. It also served as a tool to prompt students to independent work. The

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following segments taken from the dialogue demonstrated how Teresa had arranged for the students who were more skillful at certain tasks to lend assistance to other students who might need help, "OK. What I need to do then is … D and K, oh gosh, I need one of you to come and go through H's like you are going through M's. And, we need to look for mistakes there. So get it in presentation mode. … I need people who are finished. C, will you do me a favor and go through T's portfolio and see if you can find any errors with his buttons?"

Thus, it appeared that Teresa recognized the students who could help, and those who needed help. Further, it seemed as if she had orchestrated a very efficient process that kept the students who had completed their portfolios occupied by enlisting their help. The effect of which was to provide additional practice for both the helper, and the "helpee."

Student reflections did not appear to receive their usual amount of time and considerations on the last day of school. Teresa remained consistent, to a lesser degree, with the pattern she had established for this segment of the portfolios, however. She stated, "If this is all you have written on your overall reflection, you haven't written enough. You need more details, specifically. Which direction did you go? What you learned; what you liked; what you did; how you?… It looks good. Now don't forget you have also got to do you reflections. … Add one sentence there and you are good to go!" I noted that Teresa's observations were not necessarily on the quality of the reflection; they seemed to result mainly from quantity that would make the reflection a complete thought. Thus, I noted that Teresa had created a method for reviewing reflections quickly. She told me that she had come to know the students who had an aptitude for reflections, as well as, an understanding of the lengths that were required for a thoughtful reflection.

In the last day that I spent observing in the classroom, it appeared that efficient routines and procedures had been conceived and put into practice. The most noticeable variations that occurred from day-to-day seemed to be created by the demands of the day, giving that particular day its own personality. In addition to the "review and wrap-it-up" personality presented, it was also noted that there was an overall sense of satisfaction apparent in the classroom. All of the students were busy. Some were finishing their portfolios while others were helping classmates who were in need of assistance. A few

were cleaning the room and putting things away. Many of the students were taking the opportunity to see what their friends had accomplished. A sense of enthusiasm and accomplishment was displayed by many of the students, and there were even those who demonstrated the enjoyment and pride they derived from their expertise for making PowerPoint™ slides. They were actually requesting samples of their work to take home; they wanted copies of their portfolios to show to their parents! I must say I too was very impressed with the most of the portfolios that were developed by this group of students.

June 8 -- The final day. I returned to CATCE during one of the workdays for two reasons. Teresa and I had promised the rest of the faculty that we would share our experiences with them and see if we could answer their questions about implementing portfolios in their own classrooms and to take some of the student's portfolios and put them on videotape.

Since it was a teacher workday only five faculty members attended our session. Teresa and I did not rehearse what we were going to say but I recorded the session and this is what I concluded that both of us had learned from this experience. Teresa noted that she had gotten many things from our relationship. Among these was an appreciation for the portfolio process and an understanding of the significance of reflection. But, the most important thing she said that she had gotten from our collaboration was the feeling that she was now much more comfortable using technology. She explained that she was not afraid to try new things and that the way I had written basic instructions for her to use when she had needed to use the scanner or the digital camera had helped her significantly. She noted that I had also helped her to understand that instructions similar to these basic instructions that were available in the manuals and tutorials were excellent resources and more user friendly than what she had previously thought.

I feel that Teresa helped me to understand that the use of electronic portfolios as an instructional tool was as active, exciting, and rewarding as I had anticipated them to be. She also helped me to understand the multi-disciplinary nature of the process; the students learned about hardware, software, reflections, problem-solving, collaboration, electronic portfolios and the portfolio process, as well as, "any" curricular content that might have been the topic of their research for their portfolios. I also learned about many of the management considerations for the use of electronic portfolios in the classroom. I

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came to understand that the major elements of the process had been the reflections, the technical aspects, and management. I discovered that management needed to be viewed from the perspective of student freedoms versus direct instruction i.e., the reflections, by their very nature, required student choice, as well as, time for reflection. Many of the technical and mechanical aspects, on the other hand however, required the attention of the students. This instruction was delivered most efficiently to the entire class, and the sooner students were able to master the basics, the better. Therefore, direct instruction seemed to work best; whether the direct instruction came from Teresa, a classmate, or myself did not seem to make a great deal of difference. Mastery of the basics was the goal; this, in turn, freed the student to engage in the creative aspects, and to explore and develop even more technological skills on their own. Therefore, I feel that I learned an important lesson regarding the direct instruction versus reflective aspects of the process.

Appendix E

Two Stars and a Wish

Two Stars and a Wish

Stars or compliment (Tell two things that you did well in this piece of work):

1.

2.

Wish or improvement (Tell one thing that you wish you had done better in this

work):

1.

Source: Sandy Hartman, Wyoming, MI

Appendix F

Reflecting on Your Work

Circle the words that describe how you feel about the work you have selected:

Interesting	Two easy	Useful	Others:
Dull	Helpful	Worthless	_____
Fun	Important	Boring	_____
Too hard	Super	Useless	_____

Tell what made you choose the words that you did:

Circle the word below that tells how do you feel when you look at the work you did?

Happy   Okay   Not Happy

Tell what made you choose that word:

English Standards of Learning that can be met by Implementing Portfolios

The goals of English education are to teach students to communicate effectively in their communities, in the work place, and in postsecondary education.

Oral language includes speaking and listening. In the early grades, students will learn to participate in classroom discussion. Over the course of several grade levels, students will earn to prepare and to deliver presentations and to critique them in order to improve delivery.

Students become increasingly aware of the structure of language and improve written communication through frequent opportunities to apply narrative, persuasive, and expository skills.

Students will learn to acquire information from a variety of sources where this information may be used in planning and delivering presentations.

Learning is enhanced through the use of computer technology. In composition, word processing programs allow students to check spelling, grammar, and style to revise drafts. However, use of computer-aided spelling and grammar are not substitutes for learning the rules of English.

The following SOLs can be met if the entire process of implementing portfolios is used. This includes determining the purpose, the goals and objectives, and the contents for the portfolio. Once these have been determined, and the artifacts have been selected and organized, the student reflects on these artifacts and the entire portfolio. The student then presents the portfolio to the intended audience.

SOL #	Bulleted item	SOL #	Bulleted item
K.2	all	6.7	2, 5, 6, 7
K.8	2, 3	6.8	3, 5
K.11		7.1	all
K.12		7.2	all
1.11	all	7.3	all
1.12	all	7.6	5
2.9	all	7.8	4, 5, 6, 7, 8
2.10	all	7.9	all
2.11	all	7.10	all
3.1	all	8.1	all
3.2	all	8.5	all
3.7	all	9.2	all
3.8	all	9.6	all
3.10	all	10.7	all
4.1	3, 4	10.8	all
4.2	all	11.1	all
4.7	all except 4	11.2	all
4.8	all	11.7	all
4.9	all	11.9	all
5.2	all	12.1	all
5.3	all	12.2	all
5.7	all	12.7	all
5.8	all		

Appendix H

Open Ended Statements and Questions to use for your Journal

- From this assignment I learned ...

- This work shows what I have learned for this assignment because ...

- This piece of work shows that I can ...

- The reasons I chose this piece are ....

- This is what I would do differently about this work ...

- When I look back at the work I have done, I feel ...

- I am really proud of ...

- Next time I will ...

- What are the reasons that this work is important to you?

- What do you know now that you didn't know before you did this work?

- What improvements would you like to make to this work?

- What do you see as the special strength of this work?

- What could be improved?

- What suggestions would you offer based on your own experiences with this work?

- What do you think about the quality of the work? What would you change about it?

- What did you like/dislike about today?

- What would you change for next time?

- What do you feel have been your successes in this module today?

Appendix I

Directions

1. Open PhotoDeluxe
2. Click on "On Your Own"
3. Then "Get Photo"
4. Scan photo
5. Under select camera or scanner select: Twain - Acquire
6. DeskScan II software appears
   a. scanner automatically does a preview scan
   b. for a black and white drawing make sure that in the "Type" you have selected: Black and White Photo
7. Press final scan
8. Picture will now be in PhotoShop Deluxe

Getting photos from the Digital Camera

1. Open PhotoDeluxe
2. Click "On your Own"
3. Then "Get Photo"
4. Choose get digital photo
5. Select: Casio Digital then OK
6. A dialog box appears:
   Dialog box:
       Open camera -- click box
       Thumbnail photos will begin downloading
7. Select picture(s) you want
   (to select more than one: hold the shift key down while clicking on the pictures you want)
8. Press "Get Picture" -- pictures will begin downloading

Manipulating Pictures

1. Select Modify
2. If your picture has too much border you may "trim" your picture. This is located in the SIZE tab.
   a. Select trim and when you place the cursor over your picture a crosshairs (+) appears.
   b. Drag the (+) diagonally over the part of the picture you want to keep. Place the (+) inside the box and press the mouse button.
3. Size of photo must be approximately 4 X 3 or 3 X 4
       To do this go to "Photo size"
       In dialog box:

Make sure at the bottom that the proportion box is checked. Under New size, change the larger number to 4 and the other number will automatically change.

4. Your picture may end up being sideways or some other direction. If that is the case you will have to rotate your picture to get it to look the way you want it in your portfolio. To do this you need to go to the tab "ORIENTATION" and look for the rotate tool that corresponds to the way you need your picture rotated.
5. May want to look at tab called "Quality"
    Try "Instant Fix" -- if you don't like what it did, immediately go to Menu bar under Edit and go to UNDO.

To Save pictures

Under File
1. go to Export and across to File Formats
2. choose "Rotation 6" folder on desktop
3. open "Rotation 6" folder
4. name file
5. change format type to PICT file,
6. save
Then:
7. close untitled picture on screen you just modified and don't save

Appendix J

Organizing the Portfolio A

The electronic portfolio will be a way to organize the work you have done and to record our reflections on the work we have completed. We will be using a storyboard in addition to PowerPoint™ software to help us do this.

A storyboard is used to help organize our thoughts so that the story we tell makes sense. It is simply a matter of using index cards and a large sheet of paper to indicate the topics of our story and the components that need to be included. It is a place to do our rough draft work before beginning our final draft.

Materials:

Variety of colored index cards
Large sheet of poster board or bulletin board paper
Tape/Post-It note glue
Journals
PowerPoint™ software

Phase 1: Beginning a storyboard

1. Use two white cards
2. Label one: title card
3. Label one: end card
4. Attach the two cards to your poster board or bulletin board paper
5. Decorate the title card with information about yourself. This card should advertise you as a person. You can add animation and sound at this time for these two slides.
6. Decorate the end card in such a way that it indicates that the reader is at the end of the story.
7. Open PowerPoint™.
8. Make two slides in a slide show to represent your two index cards.
9. Save the two slides to your folder and be sure to call it: Portfolio.

Phase 2: Adding a project to the storyboard

1. Use a "hot pink" index card
2. Label it TABLE OF CONTENTS
3. Write the name of our first project on the table of contents.
4. Pick up two purple cards and one white card
5. Label the first purple card: Playground Project Cover Card
6. On the cover slide, write two choices: sample of work and reflection
7. Label the second purple card: sample of work
8. Label the white card: playground project reflection card

9. Decide which sample of work you would like to include in your portfolio from the playground project and write the name of it on the appropriate purple card.
10. Use your journal to write a reflection on this sample of work on the white card.
11. Open you portfolio presentation in PowerPoint™ and add a slide for each of the card you have just created. Do not add any type of sound, animation or graphics at this time. You will do this later—I PROMISE!
12. See Mrs. Simmons if you need to take any digital photos or scan any information.
13. Save any work you have added to your PowerPoint™ portfolio.
14. Be sure to have one slide for each index card you have.
15. It is now time to decide whether or not you are interested in creating a portfolio. See Mrs.Simmons for the decision making journal entry.

Phase 3: Adding more projects to the portfolio

1. We will continue to add index cards to your storyboard as we work on future projects.
2. I will always announce the color of index cards for each project
3. Each project section must have a cover card, a sample of work card and a reflection card.
4. Prior to adding slides to your PowerPoint™ portfolio, you will need to add them to your storyboard.
5. Remember to add items to your table of contents card and your table of contents slide.
6. Remember: no animation, graphics or sound at this time!
7. Be sure to ask Mrs. Simmons for information on scanning or digital photos if you need it.

Phase 4: Adding buttons to your slides

1. Once you have added at least three projects to your storyboard and three projects to your PowerPoint™ Portfolio, you may start adding buttons.
2. You must add buttons to your storyboard before you may add them to your slides.
3. Use the button symbol handout to help you place buttons on your index cards.
4. Be sure to allow your viewer to exit at any time from your portfolio.
5. Once all buttons are in place on your index cards, you may put them on your slides.
6. Remember to save all your work to your folder.
7. See Mrs. Simmons for the information on how to add buttons to a slideshow.

Phase 5: Adding animation, sound, graphics

1. Once you have added buttons to all your index cards and all your slides, you may add animation, graphics and sound to your cards.
2. Remember: the viewer may not like obnoxious sounds, the arrival of single letters to spell words of long sentences and the requirements of clicking more than once to see the contents of one slide.
3. Be sure to save all your work to your folder.

Phase 6: Peer editing

1. You will peer edit one another's portfolios after approximately three-four weeks of work.
2. See Mrs. Simmons for the peer-editing handout.

Phase 7: Portfolio reflection

1. Use your journal writing to write a reflection card on the entire process of organizing a portfolio.
2. Add this reflection card to your storyboard.
3. Add a slide to your portfolio to match the index card.
4. Be sure to save all your work.

Phase 8: Final rubric

1. When you feel your portfolio and storyboard is complete, see Mrs. Simmons for the final evaluation rubric.
2. Use the rubric to evaluate your own work.
3. Make revisions.
4. Turn in your storyboard and rubric when you feel your work is complete.

Phase 9: Loose ends

1. Record portfolios to a VCR tape.
2. Returning the final rubric.
3. Returning the storyboard.

Appendix K

Peer Editing Activity

DIRECTIONS:

1. Use the table below to evaluate the first three slides of the portfolio.

2. After reviewing the portfolios of your peers, you will share your comments with them.

NAME OF PORTFOLIO: _____

NAME OF THE AUTHOR: _____

SLIDE NUMBER	WHAT I LIKED THE MOST	SUGGESTIONS FOR IMPROVEMENT
1		
2		
3		

NAME OF PEER EVALUATOR: _____

Appendix L

Associate Work Evaluation--Portfolio Evaluation

Evaluation level	Description of performance necessary
5	Outstanding work
4	Above average work
3	Average work
2	Below average work
1	Unsatisfactory work

5	4	3	2	1
❑ Completed storyboard with ____ index cards ❑ Portfolio is well organized and demonstrates thoughtful planning ❑ Text is easy to read ❑ Navigation buttons are easy to understand and accurate ❑ Provides exits to the user on all slides ❑ All animation, graphics and sound are activated by only one click (per slide) ❑ Graphics and animation relate to the topic ❑ 0-1 spelling, punctuation, mechanics and/or grammar errors ❑ Minimum of ___ slides are used ❑ Reflections are used for each sample of work ❑ Includes a title slide, table of contents, project cover slides, and end slide	❑ Completed storyboard with ____ index cards ❑ Portfolio is organized and demonstrates planning ❑ Text is easy to read ❑ Navigation buttons are easy to understand and accurate ❑ Provides exits to the user ❑ All animation, graphics and sound are activated by only one click (per slide) ❑ Graphics and animation may/may not to the topic ❑ 2-3 spelling, punctuation, mechanics and/or grammar errors ❑ Minimum of ___ slides are used ❑ Reflections are used for each sample of work ❑ Includes a title slide, table of contents, project cover slides, and end slide	❑ Completed storyboard with ____ index cards ❑ Portfolio is organized and demonstrates planning ❑ Text is easy to read ❑ Navigation buttons are easy to understand but may not be accurate ❑ Provides limited exits to the user ❑ All animation, graphics and sound are activated by only one click (per slide) ❑ Graphics and animation may/may not to the topic ❑ 4-5 spelling, punctuation, mechanics and/or grammar errors ❑ Minimum of ___ slides are used ❑ Reflections are used for each sample of work ❑ Includes a title slide, table of contents, project cover slides, and end slide	❑ Incomplete storyboard ❑ Portfolio is unorganized ❑ Text is difficult to read ❑ Navigation buttons are used but may not be accurate ❑ Provides limited exits to the user ❑ All animation, graphics and sound are activated by only one click (per slide) ❑ Graphics and animation may/may not to the topic ❑ 6-7 spelling, punctuation, mechanics and/or grammar errors ❑ Minimum of ___ slides are used ❑ Reflections may not be complete ❑ Includes a title slide, table of contents, project cover slides, and end slide	❑ Incomplete storyboard ❑ Portfolio attempted but not finished

Appendix M

Button Symbols

Custom or Invisible		Home		Help		Information	
Back or Previous		Forward or Next		Beginning		End	
Return		Document		Sound		Movie	
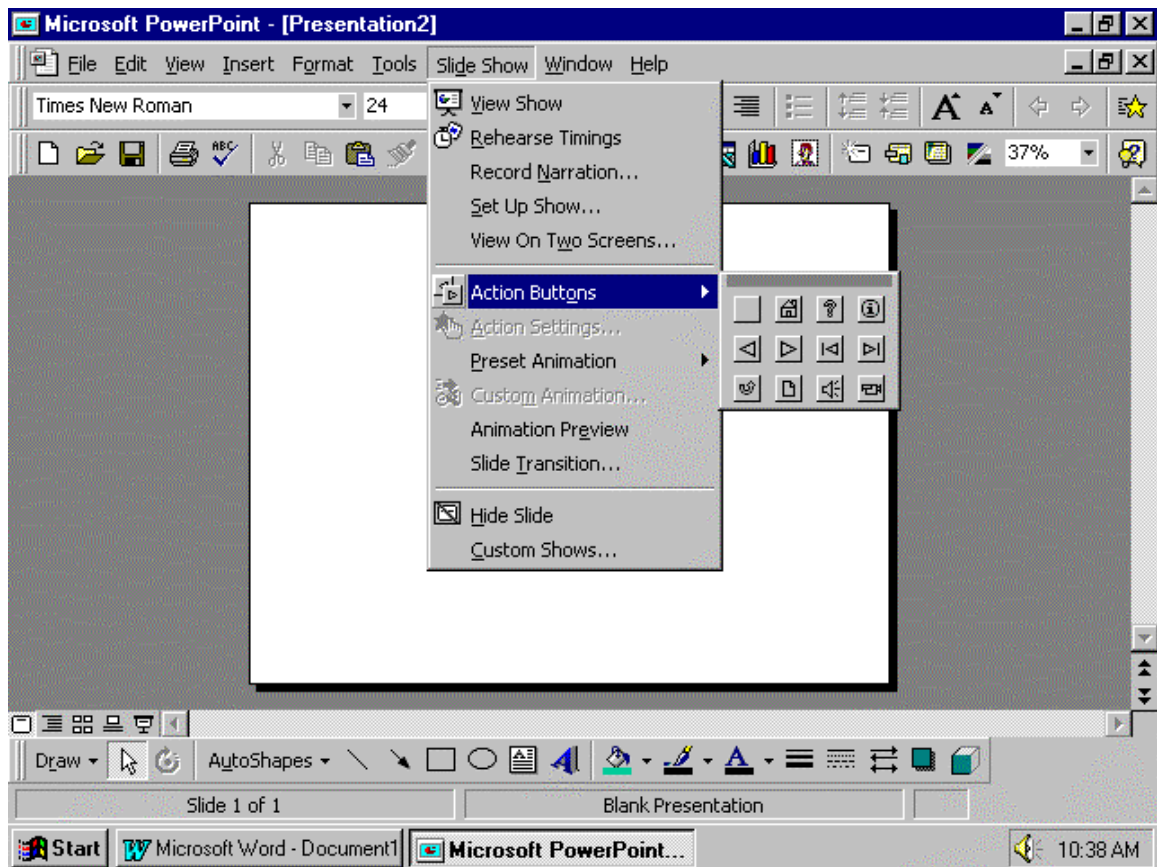
Appendix N

Adding Buttons to a Slideshow

Buttons allow you to jump to different slides within your presentation. Action buttons are like controls on an audio CD player – they let you jump to any slide quickly like your Table of Contents, go back, go forward, or even stop the presentation.

To add an action button to a slide, follow these steps:

1. Display the slide in Slide view.
2. Select **Slide Show**, **Action Buttons**, and pick a button from the palette that appears next to the command (see types of buttons below). For instance, if you want to create a button that advances to the next slide, you might choose the button with the arrow pointing to the right. (On the MAC the words are shown that describes the buttons and on the PCs the buttons are shown.)
3. Choose the button, by clicking on it, that you think your reader will most strongly identify with the action you're going to assign to it.
4. Your mouse button turns into a crosshair. Drag to draw a box on the slide where you want the button to appear. (You can resize it later if you want, the same way you resize graphics.) PowerPoint™ draws the button on the slide and opens the Action Settings dialog box which controls to which slide the button connects.
5. If you are working on placing a button to connect your reader from the Table of Contents page to the different parts of your portfolio choose the **Custom** button. This "invisible" button will be placed over top of your words in your Table of Contents. (see step 9 to change the color and step 10 to delete the line around your button)
6. Choose the type of action you want to happen when the user clicks the button. Most of the time you will choose **Hyperlink To**. This can be to a slide, an Internet hyperlink, or a document on your computer.
7. Open the drop-down list for the type of action you chose, and select the exact action (for instance, **Next Slide**).
8. Click **OK**. Your button appears on the slide.
9. To change the color of your button go to **Fill** in the drawing menu at the bottom of the screen.
   a. if you want color for your button choose the color
   b. if you don't want color choose **No Fill**
10. To work with the line around, your button, go to **Line Color** in the drawing menu at the bottom of your screen.
    a. if you want to keep the line, do nothing
    b. b. if you want to delete the line, choose **No Line**
11. View the presentation to try out the button(s).

Appendix O

Portfolio Slideshow Tips

TEXT

1. Limit of 5-6 words per line (except for reflection slides)
2. Limit of 5-6 lines per slide (except for reflection slides)
3. Left justified text is best for most purposes
4. Plain text is the best for most writing
5. Bold, italics or specialty fonts are best to emphasize points

FONT

1. Only 1-2 types per slide
2. Use at least size 18 point font size
3. Use bright colors of fonts on dark slide backgrounds—the brighter, the better

GRAPHICS

1. Used to illustrate what you are talking about
2. Remember: bright colors for graphics and dark colors for backgrounds
3. Size is appropriate for slide

BUTTONS

1. Appropriate for the content
2. Placement is consistent from slide to slide
3. They work as stated
4. Size is appropriate for slide
5. Invisible buttons have clear instruction for use
6. Table of contents and end buttons are on each slide

GENERAL TIPS

1. All graphics and text should arrive on the screen with only one mouse click
2. Sound, if used, is clear
3. Transitions and backgrounds demonstrate consistency

Appendix P

Organizing the Portfolio B

The electronic portfolio will be used as a way to organize work and as a method to reflect upon the work completed. A storyboard will be used in addition to PowerPoint™ software to help do this.

A storyboard is used to help organize thoughts so that the story told makes sense. It is simply a matter of using index cards and a large sheet of paper to indicate the topics of the story and the components that need to be included. It is a place to do a rough draft before beginning the portfolio.

Materials:

Variety of colored index cards
Large sheet of poster board or bulletin board paper
Tape
Journals
PowerPoint™ software

Phase 1: What is a portfolio?

1. Discuss purpose
2. Identify the variety of audiences
3. Cite examples
4. Demonstrate sample electronic portfolios

Phase 2: Using journals (optional)

1. Introduce journals for documenting thoughts related to class/projects
2. Examine the use of journal writing in various situations other than school
3. Associate journals with the reflection process
4. Discuss what could be included in a journal entry
5. Distribute **OPEN ENDED STATEMENTS AND QUESTIONS TO USE FOR YOUR JOURNAL**
6. Discuss handout with students
7. Students should keep the handout with their journal at all times.
8. Label journal entries with project name

Phase 3: Creating an electronic portfolio

1. Open PowerPoint™
2. Create a title slide
3. Decorate the title slide with information about yourself. This card should advertise you as a person.
4. Create a Table of Contents slide
5. Create an end slide
6. Decorate the end slide in such a way that it indicates that the reader is at the end of the story.
7. Save the three slides and be sure to call it PORTFOLIO.
8. Students review the work of one another (see **PEER EVALUATION-THREE SLIDES**)

9. Students record comments about the slides they viewed
10. Peer comments are shared
11. Respond in journal (see **PERSONAL REFLECTION-THREE SLIDES**)

Phase 4: Beginning a storyboard

1. Use two white cards
2. Label one: title card
3. Label one: end card
4. Use one hot pink card
5. Label: Table of Contents
6. Attach the three cards to your poster board or bulletin board paper

Phase 5: Adding a project to the storyboard

1. Write the name of the first project on the Table of Contents card.
2. Pick up two purple cards and one white card
3. Label the first purple card the title of your first project. This is the project cover card.
4. On the first project card write: "sample of work" and "reflection"
5. Label the second purple card: "sample of work"
6. Label the white card: "reflection card"
7. Decide which sample of work to include in the portfolio from the first project and write the name of the first project on the second purple card.

Phase 6: Adding a reflection to the storyboard

1. Discuss reflection
2. Identify reasons to reflect
3. Identify ways to reflect
4. Make associations between reflections and personal goals/professional experiences
5. Use your journal to write a reflection about the sample of work on the white card.

Phase 7: Adding slides to PowerPoint™

1. Open the portfolio in PowerPoint™ and add a slide for each of the cards created on the storyboard. Do not add any type of sound, animation or graphics at this time.
2. See the teacher if you need to take any digital photos or scan any artifacts.
3. Be sure to have one slide for each index card created.
4. Save any work added to the PowerPoint™ portfolio.

Phase 8: Adding more projects to the portfolio

1. Continue to add index cards to the storyboard as more work is completed.
2. Specific colors of index cards will be used to identify different projects.
3. Each project section must have a cover card, a sample of work card and a reflection card.
4. As more cards are added to the storyboard, add slides to the PowerPoint™ portfolio.
5. Remember to add items to the Table of Contents card and the Table of Contents slide.
6. Do not add animation, graphics or sound at this time.
7. Be sure to ask the teacher for information on scanning or digital photos.

Phase 9: Adding buttons to slides

1. Once three project sections have been added to the storyboard and three project sections have been added to the PowerPoint™ portfolio, start adding buttons.
2. Add buttons to the storyboard before adding them to slides.
3. Use the button symbol handout to help organize the buttons on the index cards (see **BUTTON SYMBOLS**).
4. Be sure to allow the viewer to exit at any time from the portfolio.
5. Once all buttons are in place on the index cards, add buttons to the slides.
6. See the teacher for the handout on **ADDING BUTTONS TO A SLIDESHOW**.
7. Remember to save all work.

Phase 10: Adding animation, sound, and/or graphics

1. Once buttons have been added to all the index cards and all the slides, add animation, graphics and sound to the slides.
2. Remember that the viewer may not like obnoxious sounds, the arrival of single letters to spell words of long sentences and/or the requirement of clicking more than once to see the contents of one slide.
3. Distribute **PORTFOLIO SLIDESHOW TIPS** and discuss.
4. Remember to save all work.

Phase 11: Peer editing

1. Peer edit portfolios using the **PEER EVALUATION-20 SLIDES**.
2. Share information recorded with the author of the portfolio.
3. Make changes and revisions.

Phase 12: Portfolio reflection

1. Review work included in the portfolio.
2. Review the entire portfolio
3. Add a reflection slide that illustrates your feelings about the entire portfolio process
4. Remember to save all work.

Phase 13: Final rubric

1. When the portfolio and storyboard are complete, see the teacher for the **PORTFOLIO EVALUATION**.
2. Use the rubric to evaluate work completed.
3. Make revisions.
4. Turn in the storyboard and the rubric when the portfolio is completed.

Phase 14: Loose ends

1. If time permits, include personal information in the portfolio.
2. Record portfolios to a VCR tape.
3. Print portfolio.
4. Return the final rubric.
5. Return the storyboard.

Appendix Q

Teresa's Continued Use of Portfolios – 1998-99

During the second semester of the 1997-98 school year, I was introduced to the concept of electronic portfolios in my classroom. The concept was not foreign to me as an instructor because I had been an active participant in the county wide writing portfolio assessment team. I had seen the benefits of portfolio assessment in the writing programs across numerous grade levels but was unaware of how to implement this process in other courses that mandated a collection of samples of student work that were not "paper and pencil" restrictive. After a few meetings with Jane Falls in the early spring of 1998, I discovered that it was the electronic portfolio that students could use to showcase a collection of their work from various classroom endeavors.

While working with Jane Falls, I was able to slowly and methodically implement a portfolio process into my curriculum. As the semester progressed, I was able to adjust and modify my teaching techniques to adequately accommodate the electronic process and by the end of the semester it had become an integral part of the curriculum.

When the 1998-99 school year began, I decided to continue the use of electronic portfolios. As the year continued, each group of children (six groups of eighth graders and four groups of ninth graders), gave me the opportunity to allow the portfolio process to evolve and become more comprehensive. At the end of each course, I was able to measure (using teacher created rubrics) growth in the development of the portfolio process for the children that exceeded my original expectations of the previous school year.

1998-1999 SCHOOL YEAR—EIGHTH GRADE

The first group of eighth grade students to participate in the electronic portfolio process followed the same procedural steps that I had used at the end of the 1997-98 school year. However, I was beginning to discover that some of the "required" procedural elements were not necessary for all the students. It appeared that some of the students were able to move through the process in other ways and still produce a high quality portfolio. I decided to make modifications for the next group.

I experimented with the second group of eighth grade students by eliminating the creation of individual storyboards. As a group, we created a storyboard in small sections as we worked on the portfolios and I found the portfolios to be well organized and easily understood. Because of the class time saved, I was able to spend more time assisting students with proper writing techniques they could apply to their reflections.

After reviewing the process used with the second group of eighth graders, I decided that the portfolios were improving in sustenance and quality. It appeared that the "group" storyboard allowed students to organize materials in a coherent and efficient manner and that the reflections were improving due to the direct instruction provided on how to write a quality paragraph. I continued these changes with the third group and found that when I compared their work to the work of the second group, the portfolio process was being refined and the quality of the overall product was improving.

When the process was started with the fourth group of students, I decided to maintain the same procedural elements of creating an electronic portfolio and to increase the emphasis and time on writing quality reflections. Again, I saw measurable improvements in writing samples as well as high achievement in the overall electronic portfolio.

After reviewing the work of the first four groups of students, I decided to monitor the process with the last two groups. I feel that my techniques evolved and improved during this time and I became a better facilitator of the process. The student outcomes continued to improve and the process seemed to be becoming more "streamlined" with each group.

1998-1999 SCHOOL YEAR—NINTH GRADE

My first attempt at implementing portfolios with a group of ninth graders was very limited. The first group I tried to work with was only able to create a framework for their artifacts, insert the items and label them. I was unable to incorporate any of the features of the software and the reflective writing never made it to the keyboard.

After a disappointing first attempt, I tried again with the second group and found that I was able to move them further along. The second group created the framework, inserted artifacts, labeled items and made use of some of the features of the software. Reflections were written in journals but lack of time kept the writing samples from being

included in the electronic version. Even though we did not complete the entire portfolio, progress had been made over the first group.

Again, I implemented the process with a new group and found that I was able to accomplish all the items completed by the second group AND we were able to include reflections in the electronic version. Most students had completed their portfolio by the end of their experience in my classroom but their work was not considered to be "high" quality. Interestingly, my teaching partner started taking great interest in this process and after observing three groups, decided that he wanted to become part of the experience.

The fourth group improved tremendously as compared to the other three groups. They were able to complete the portfolios, incorporate numerous software elements, include quality reflections and combine their ninth grade work with previous eighth grade portfolios. I was able to implement more of the successful techniques I had used with the eighth graders and a more active role on the part of my teaching partner contributed to the creation an outstanding portfolio by many of the students.

FINAL THOUGHTS

The electronic portfolio has been an outstanding addition to my classroom. The creation of the portfolio allows students to identify the elements of their work that need to be highlighted and/or showcased while the writing of the reflections gives the students the opportunity to express their inner thoughts about the work they completed. It also allows students to comprehensively connect individual samples of work to the content of the curriculum.

A unique feature of the electronic portfolio is its ability to create a vehicle by which students are eager to learn proper writing skills (reflections), new technology skills (camera and scanner), and higher levels of software use. It easily integrates many of the skills required of the Standards of Learning in such a way that students are highly engaged with the work.

My observations of the electronic process have proven to me that the skills acquired will assist the students in preparing for their school/career experiences of the future. Documenting and organizing work completed is essential to preparing for a college application and/or a job application; electronic portfolios provide students with a technique of how to accomplish these tasks.

VITAE

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Education

Ph.D.   Curriculum and Instruction (Fall 2001)
            Virginia Polytechnic Institute and State University (Virginia Tech)
            Dissertation: Using a Reflective Process to Implement Electronic Portfolios

Other   Advanced Graduate Work   Longwood College
             1985   Longwood, Virginia
             Credential: Secondary Math Endorsement

M.Ed.   Reading   James Madison University
             1978   Harrisonburg, Virginia
             Credential: Reading Specialist, Developmental Reading K-12

B.A.   Elementary Education   Virginia Polytechnic Institute and
             1976   State University
             Credential: N/K-3, 4-7; Middle School Endorsement

Areas of interest and experience: Integration of technology into instruction; designing and implementing professional development for teachers in the use of technology as a tool, including multimedia software, database and spreadsheet software, web page development, and peripherals such as scanners and digital cameras.

Professional Experience in Higher Education

Coordinator of Information Technology Services

August 2001 – Present   Office of the Dean – College of Human Resources
                                             and Education; Virginia Tech, Blacksburg, VA

Provide leadership for and coordination of technology programs and applications for the College. Oversee the college technology support system, providing training programs for personnel in instruction that enhances the use of the web environment. Advise the college administration on issues related to the operations of its technology environment. Provide technical advice to address technical initiatives and problems. Serve as lead technology professional for the College, instructing, directing and monitoring the work of technical staff.

Director of Academic Computing

July1999 – July 2001   Catawba College
                                     Salisbury, NC

Responsible for providing leadership, campus-wide assistance and support to the faculty in the development of technology enhanced materials. Also to promote the innovative and pedagogically sound use of both current and leading edge technologies designed for the enhancement of teaching and learning.

Program Coordinator (dual position)

July 1998 – June 1999   Department of Teaching and Learning
                                     Virginia Tech, Blacksburg, VA

Coordinate Online Instructional Technology Masters Program. Duties include scheduling of three cohorts of students across the state of Virginia; liaison between students and instructors and graduate school; do site visits to troubleshoot technical and instructional problems students may be having; set up listserv for students to share online learning experiences; coordinate sites making sure that rooms, equipment, software and onsite help are available.

August 1998 - Present   College of Human Resources and Education
                                     Virginia Tech, Blacksburg, Virginia

Coordinate Virginia Educational Technology Alliance (VETA) project which is a program designed to offer instruction technology developed for specific content areas. Duties include developing and implementing a masters level class for a local school system which will look at how teachers design effective strategies to integrate technology into their content area.

Other activities:
- Member of planning committee for a three-day technology conference sponsored by the Appalachian College Association held in Knoxville, Tennessee.
- Developer of a three day Technology Fair for the Virginia Education Association's statewide Instructional Conference.
- Member of Planning committee and coordinator for 1999 Student Technical Assistants Training funded by a Jesse duPont Ball Foundation grant sponsored by the Appalachian College Association.
- Consultant to local school personnel in helping them implement electronic portfolios in their schools.

Clinical Faculty

August 1997 - May 1998   College of Human Resources and Education
                                     Virginia Tech, Blacksburg, Virginia

Faculty position that provided instructional technology support to K-12 teachers in partnership with a nearby rural school. Involved in the day-to-day activities in an innovative school, Center for Applied Technology and Career Exploration (CATCE), where I was available to collaborate with teachers in providing instructional technology support while they supplied the content knowledge.

Other activities:

- Coordinator and designer along with other members of a workshop for Student Technical Assistants Training funded by a grant by the Jesse duPont Ball Foundation. This four-day workshop involved training potential Student Technical Assistants (STAs) from invited Appalachian College Association's colleges and universities to go back to their respective schools and set up programs to offer technical support programs for administration, faculty, and staff.
- Member of college-wide Technology Task Force designated to assist program areas in incorporating and assessing technology competencies required of Virginia Tech students in education.
- Provided follow-up training to the previous summer's cadre of teachers involved in a State Council of Higher Education in Virginia (SCHEV) grant.
- Provided technical support to the coordinator of the Virginia Tech Literacy Masters program where I set up a listserv for the group; taught students to use the Internet for research and how to access the university library system using a browser.

Graduate Assistant

May 1996 - August 1997   Department of Teaching and Learning Virginia Tech, Blacksburg, Virginia

Graduate student in charge of the Educational Technology Lab (ETL). Responsibilities included: Implemented a new service program (Housecalls) for the College of Human Resources and Education where graduate students are responsible for technical support for administration, faculty, staff and graduate assistants. Maintained 50 station computer lab (both PC and Macintosh). Responsible for scheduling graduate students who worked in the ETL.

Other activities:

- Coordinated second year of a two-year grant from the State Council of Higher Education (SCHEV) that trained a cadre of teachers from multiple school systems in the state of Virginia. Responsibilities included conducting a needs assessment of each locality for their training; designed and implemented training for each training site as well as schedule times, rooms, and graduate assistants to help facilitate the training.
- Designed and facilitated workshops for preservice teachers, graduate students, and higher education faculty in the areas of using the Internet, HyperStudio, and other software applications.
- Member of a cadre of graduate students who designed and facilitated summer workshops for higher education faculty from selected Appalachian College Association's colleges and universities.
- Developed a Telecommunications Module that was used to help pre-service teachers to integrate the internet and email in their instruction.
- Co-taught a masters level class "Educational Applications of the Micro-computer."

Graduate Assistant

August 1994 - May 1996   Department of Educational Leadership and Policy Studies, Virginia Tech, Blacksburg, Virginia

Technical Assistance Center : Assisted Research Associates in conducting research in the areas of mild/moderate and severe disabilities. Developed and facilitated workshops in the use of software, adapted computers, augmentative communication devices, and assistive technology for teachers of students with disabilities.

Other activities:
- Assisted program chair for the 1996 Virginia Council for Learning Disabilities Conference in all aspects of her job.
- Purchased and inventoried over $10,000 worth of equipment for the Center.
- Developed "Spotlight on Software" workshop for Southwest Virginia educators who work with students with mild/moderate disabilities.

Professional Activities

University/College Committees:

Member, Academic Policy and Budget Committee, Catawba College, 2000-2001.

Ex-Officio, Curriculum and Instruction Committee, Catawba College, 1999-2001.

Chair, Technology Advisory Committee, Catawba College, 1999-2001.

Member, College Task Force on Technology, Virginia Tech, 1997-1998.

Member, Planning Committee for the College of Education's 25th Anniversary, Virginia Tech, Fall, 1996.

Member, University Computing and Communications Resource Committee, Appointed by the University president, Paul Torgersen, Virginia Tech, 1995-1996.

Consultant:

Catawba Overton Partnership for Excellence (COPE): Provided input in purchasing $25,000 of equipment and software for Overton's (a local public school) laptops. Provided training to Overton teachers in the use of integrating the use of digital cameras, scanners, software, internet with laptops.

Corridor Consortium, North Carolina: Provided technology training to 100 Teacher Education faculty members from six colleges in the I-85 corridor. Provided input into the purchasing of $24,000 worth of software for the Teacher Education Departments to these six colleges.

T/TAC Technology Network, Blacksburg, Virginia: Facilitated workshop on the use of the AlphaSmart and DreamWriter mini-computers, July, 1996.

Ferrum College, Virginia: Developed multi-media presentation for the department of Teacher Education accreditation review, March, 1996.

Wytheville County School Board, Wytheville, Virginia: Facilitated workshop for the school board on the use of the Internet as an educational resource for teachers and students, December, 1996.

Professional Experience in K-12 Education

Bedford County Schools
Bedford, Virginia
August, 1989 - June, 1994 -- Middle School Level

Taught all subjects at the seventh grade level as well as being the computer coordinator for Forest Middle School. Computer contact person for the Virginia Department of Education for Bedford County.
Developed the computer curriculum that integrated the language arts program with basic computer literacy

skills. Developed and implemented a 6-week program for gifted students using Lego-Robotics. Also, used portions of this program for a two-week summer program for disadvantaged students.

January, 1980 - July, 1989 -- High School Level

Taught developmental reading to eighth graders; remedial reading to eighth and ninth graders; seventh grade-- all subjects; Math to eighth, ninth and twelfth graders; and computer literacy to eighth graders. Classes have been taught in a variety of teaching situations, including individualized and remedial class instruction, and both in a self-contained and departmentalized basis. Students ranged from educationally handicapped to gifted.

Virginia School for the Deaf and the Blind
Staunton, Virginia
August, 1978- December, 1979

Reading Specialist for students in primary through high school grades. Tested perspective and enrolled students to determine reading ability and developed educational plans.

James Madison University
Harrisonburg, Virginia
September, 1976 - May, 1978

Graduate assistant, which supported reading tutors in troubleshooting problems of elementary children, both at school sites and at the college reading clinic; wrote case reports recommending corrective action. Also developed questionnaires, tallied and analyzed the results. Did research for the Department Chairperson for Elementary Education.

Professional Memberships

Association for Supervision and Curriculum Development
EDUCAUSE
International Society for Technology in Education
Phi Delta Kappa