A quantitative study focusing on the effect of electronic portfolios in teacher education

Jarrod Sanson
Louisiana State University and Agricultural and Mechanical College

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A QUANTITATIVE STUDY FOCUSING ON
THE EFFECT OF ELECTRONIC PORTFOLIOS
IN TEACHER EDUCATION

A Dissertation
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Educational Theory, Practice, and Policy

by
Jarrod Lance Sanson
B.S., Northwestern State University of Louisiana, 2000
M.Ed., Northwestern State University of Louisiana, 2005
August 2013
Dedicated to the Moms,
the Restaurant,
the Dames,
Lori Anne,
and the St. Landry’s Sheriff Department.
ACKNOWLEDGEMENTS

I would like to thank my committee for the support and dedication they have shown to my education and this project. Thank you to Dr. Eugene Kennedy who has been my committee chairperson and for his unwavering patience throughout this process, Dr. S. Kim MacGregor who helped me through the years in the understanding of research, Dr. Earl Cheek who provided his guidance in the field of educational leadership, and Dr. James Van Scotter who provided his wisdom in the process.

I would like to thank the participants in my study; their willingness to provide responses would not have made the study possible. I would like to thank all of the teachers, mentor teachers, and administrators who provided their opinions in the study.

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I would like to give a special acknowledgement to my dear friend and former colleague, Lori Anne Anzaldua McKay. Sadly, Lori Anne is no longer on this earth to help with the celebration of this achievement. She passed away in March 2013. Through the years before I started my doctorate and throughout our time working on our separate doctorates, she was a
constant companion and “voice of reason” through any project and judgment that I was making through my education career. This dissertation and completion of my doctorate is as much hers as it is mine. I miss her dearly and honor her in the dedication of this paper and my acknowledgements.

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ABSTRACT

Portfolios have been used in the field of education as a form of assessment since the 1980s. As time has progressed, portfolios have transitioned from paper to electronic form. Research on electronic portfolios has focused on implementation issues and their impact on student learning. There has been limited effort, however, on their long-term impact. The purpose of this quantitative study was to examine the perceived impact of electronic portfolios on the beginning careers of classroom teachers. More specifically, this study sought to determine if use of electronic portfolios during pre-service education impacted the attitudes and performance of new teachers. The study used a survey design. A sample of graduates of teacher education programs in Louisiana was selected and asked to complete a survey that measured perceived technology knowledge, content knowledge and pedagogical knowledge. Survey respondents (n=189) were sorted into groups based on whether or not they developed an electronic portfolio as part of their teacher preparation program. These groups were compared with respect of each of these three areas. The results indicated that those who had completed an electronic portfolio in their teacher education program had higher perceived levels of competence with regard to technology knowledge and content knowledge in mathematics. The following information can be used by universities to determine if electronic portfolios are a viable assessment tool for use by their teacher candidates.
CHAPTER 1
INTRODUCTION

What does it mean to assess? One of Merriam-Webster’s definitions for “assess” is “to determine the importance, size, or value of” (2008). In any field, various forms of being assessed occur. In education, to assess is to compare knowledge, skills, and dispositions versus some form of standard. How something is assessed and what is to be assessed depends on the situation. Yet, as we try to assess, an impact needs to be made on the assessor and the assessed.

As standards from agencies have guided the way to assess the effectiveness of teacher candidates’ performances, universities, as part of their accreditation, have been increasingly required to provide better documentation of knowledge, skills, and dispositions. To provide better documentation, universities have begun looking for alternatives that not only help provide more detailed documentation, but also provide teacher candidates ways in which to exhibit the skills that they have learned within their teacher education degree (Wetzel & Strudler, 2008; Barrett, 2004).

One instrument that is being used for documentation and evaluations within teacher education is the portfolio. Portfolios have been part of teacher education since the mid-1980s when they were paper-based. Starting in the late 1990s, the transition from paper-based to electronic portfolios began. According to Lorenzo and Ittelson (2005), the electronic portfolio has helped “enhance teaching, learning and … assessment practices” (p. 2). An electronic portfolio is “…a digitized collection of artifacts, including demonstrations, resources, and accomplishments that represent an individual, group, community, organization, or institution” (Lorenzo & Ittelson, 2005, p. 1). In 2002, approximately 90 percent of all teacher education programs employed some form of portfolio system (Meyer & Latham, 2005).
As the demand for electronic portfolios increased, portfolios started moving more into the realm of a virtual learning environment (VLE). A VLE is “…an information system that facilitates e-learning” (McGill & Hobbs, 2008). These systems have ranged from commercial systems such as TaskStream, LiveText, iWebfolio, to university-built system such as those used by Western Kentucky. A common sentiment among universities for the use of electronic portfolio systems is that these systems have “cross-platform usability, affordability, ease of use, and flexibility” (Hall, Kiggins, & Warner, 2005).

**Accreditation**

Part of the move to electronic portfolios in teacher education occurred with the need for documentation for accreditation. The National Council for Accreditation of Teacher Education (NCATE), which is the national accrediting body for colleges of education in the United States, sets the standards to “measure an institution’s effectiveness according to the profession’s expectations for high quality teacher education” (NCATE, 2008). As part of its vision of the 21st century, NCATE specified that accredited institutions should “administer multiple assessments in a variety of forms, engage in follow-up studies, and use the results to determine whether candidates meet professional standards and whether graduates can teach so that students learn” (NCATE, 2008). Also, according to NCATE (2008), these same institutions should “prepare candidates who can integrate technology into instruction to enhance student learning” and “encourage collegiality, reflective practice, continuous improvement, and collaboration among educators, learners and families”. As part of the reaction to their new vision, NCATE modified their standards in 2002 to reflect this changed vision. The effect can best be seen in the first two standards for accreditation. According to Strudler and Wetzel (2005), “electronic portfolios were
initialed in large part to address NCATE requirements for documenting teacher candidates’ attainment of standards.”

States also started driving institutions to use electronic portfolios. In 1994, to help with the alignment with Kentucky’s New Teacher Standards, Western Kentucky University set up a data management system that included an electronic portfolio of authentic assessments (Evans, Daniel, Michovch, Metze, & Norman, 2006). In 2003, institutions within the state of Louisiana began using an electronic portfolio system called PASS-Port to produce performance data that could be used for accreditation purposes. Concurrently, the Louisiana Department of Education started developing a system called PASS-Port K-12 that would help document materials by new teachers to be used within the Louisiana Teacher Assistance and Assessment Program (LaTAAP). Part of the LaTAAP evaluation process is for new teachers to complete a portfolio. Starting in Fall 2004, the Louisiana Department of Education developed the Higher Education Portfolio Evaluation Committee whose purpose was to align the portfolios being compiled within LaTAAP with what was being required of pre-service teachers within the various universities. Part of the alignment included using electronic portfolios as part of the evaluation process instead of paper portfolios that were used in previous years. While the committee has since been dissolved and most of the universities have transitioned into using other portfolio-based electronic systems, the issue of the alignment still persists. As of 2008, within the state of Louisiana, over 2,000 teachers were evaluated through the LATAAP program every year (M. Posey, personal communication, July 30, 2008).
Focus of Literature

Portfolio Implementation

In the field of electronic portfolios as it applies to teacher education, the main focus of the research has concerned the implementation of electronic portfolios within institutions. Qualitative cases studies have been published in which the processes of implementation are discussed. Evans, Daniel, Mikovch, Metze, and Norman (2006), for example, provided the implementation process that Western Kentucky University used in developing their portfolio system and how they maintain the overall involvement of both students and faculty in the portfolio assessment process. Ledoux and McHenry provided that “certain premises must be made as to the way initial training process with portfolios will occur” (2006). Cunningham (2002) stated that the process requires a great deal of effort in which faculty need to work in concert over time.

Within the confines of the university, uses of the data received from electronic portfolio scores and how the scores are being used are in the initial stages. A study conducted in 2007 looked at score reliability and validity through the use of correlations. Derham and DiPerna (2007) examined portfolios and their connection to student teaching evaluation, PRAXIS scores, grade point average (GPA), internal consistency, and inter-rater reliability. Their study concluded that portfolios had acceptable levels of internal consistency and portfolio performance was positively correlated with PRAXIS II scores and GPA (Derham&DiPerna, 2007). Part of the issue with finding significance with any other relationship was the issue of experience of the raters and a relatively small sample.

In relation to faculty perceptions of the use of electronic portfolios, Penny and Kinslow conducted a qualitative study asking faculty members about their experiences working with
electronic portfolios, reflecting on the impact that the portfolios have made on students and themselves. The study found that past experience working with paper portfolios influenced their preference concerning electronic portfolios (Penny & Kinslow, 2006). Strudler and Wetzel (2008) concluded that faculty satisfaction with electronic portfolios was related to student centered teacher education and willingness to be team players.

Student Perception

Student views of electronic portfolios were divided between the use of the electronic portfolio with the university and the use of the electronic portfolio beyond the university. In one study, after completion of the electronic portfolio, students had a “sense of accomplishment, believed that they were assessed in a more authentic way, and viewed technology use as essential” (Wilson, Wright, & Stallworth, 2003). In a subsequent study done by Barlett and Sherry, more than half of the students surveyed said that the electronic portfolio “can be used to showcase teaching and learning” (2004). Another study conducted over the span of a year interviewed students twice concerning their perceptions of the electronic portfolios. Chambers and Wickersham found “the process of building their ePortfolios enhanced their technology skills and provided a mechanism for ease of storage and accessibility” (2007). Pecheone, Pigg, Chung, and Sourviney (2005) found that 72% of students who participated thought the electronic portfolio process was more time consuming than paper and videotape submission, but 70% preferred completing the electronic portfolio.

There is some evidence, however, that students’ attitudes towards portfolios change when the focus is on “life” after the university. In an Oklahoma study, for example, students were positive about carrying some of the skills, such as maintaining a portfolio, over into their teaching position (Stansberry & Kymes, 2007). However, the researchers also concluded that they
“were somewhat disappointed that the transformations specifically in the use of e-portfolios as assessment tools were rather weak” (Stansberry & Kymes, 2007). Barlett and Sherry also found as part of their survey that “…the experience of creating electronic portfolios increased the likelihood they would use technology in the future employment” and that they “…anticipated using their portfolios to reflect upon their teaching development” (2004). Yet, Wilson, Wright, and Stallworth found with their students that they “viewed the electronic portfolio more as a product than a process for their own and their future students’ learning” (2003). Ma and Rada (2006) concluded that students report no gain in their technology skills. As for the ability to reflect, Beck, Livne, and Bear (2005) found that portfolios had a positive impact on teacher development through reflection had.

While research is focused on implementation and current students experiencing electronic portfolios, there remain questions concerning the impact of having completed an electronic portfolio. Yao et al. (2005), as part of their thoughts on future investigations, wanted “to know if the in-service teacher will continue to use the same type of reflection in the profession.” The group also recommended that researchers “assess the impact of the pre-service teacher’s portfolio on P-12 student learning” (2005).

**Purpose of the Study**

The purpose of this study was to determine the effects of having pre-service teachers create electronic portfolios during their teacher preparation programs. Teachers who have completed LaTAAP during the research time frame were contacted and asked to complete an online survey which asked them to evaluate the effectiveness of having completed an electronic
portfolio as it applies towards preparing them for the portfolio portion of the LaTAAP evaluation.

**Research Questions**

Research questions for the study were:

- Does creating an electronic portfolio in preservice enhance teaching ability?
- Does creating an electronic portfolio in preservice develop reflective skills?
- Does creating an electronic portfolio in preservice encourage technology integration in the teacher’s teaching?

The hypotheses for this study were the following:

- The development of an electronic portfolio in preservice has enhanced the teaching ability of the teacher.
- The developing of an electronic portfolio in preservice has enhanced the ability to reflect by the teacher.
- The developing on an electronic portfolio in preservice has enhanced technology by the teacher.

**Significance of the Study**

This study was the first of its kind to combine the three areas of focus concerning electronic portfolios in teacher education together. While Barlett and Sherry (2004) focused on technology only and Yao et al. (2005) focused on reflective processes and teaching competencies, this study was the only one of its kind to look at technology integration, reflective process and teaching competencies together. This study was the first in the field to look at the effects of having completed an electronic portfolio. Most studies having looked at pre-service teaching at the time of completion and have examined portfolio scores and views to other
elements at the immediate time of completion (Barlett & Sherry, 2004; Yao et al., 2005). By taking a further pulse of the teacher away from their pre-service tenure, the impact of having completed an electronic portfolio is be further explored. Finally, this study has relevance to institutions that have questioned the value of having teacher candidates complete electronic portfolios.

**Limitations of the Study**

Every effort was made to include teachers who completed their degrees from the variety of universities and portfolio systems within the state of Louisiana. The instrument used was made widely available to participants by the delivery method of an Internet-based survey. However, the study is limited to Louisiana and may not be reflective of the entire United States’ viewpoint of electronic portfolios. The scope of the study was also limited by the time frame and effort available towards the study. A more longitudinal study focusing on multiple cohorts would be appropriate for future research. Also, the participants were self-reporting on their abilities and perceptions of their teaching. A qualitative study using observations would be an alternative concerning the participants’ teaching ability. Finally, efforts to include mentors teachers and administrators in the study were unsuccessful. The views these individuals held of the participating classroom teachers would have added data that was not based on self-reported perceptions of participants.
Table 1.1
Definitions

<table>
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<tr>
<th>Terms</th>
<th>Conceptually</th>
<th>Operationally</th>
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<tr>
<td>Effective</td>
<td>Producing a decided, decisive, or desired effect</td>
<td>A decisive improvement of creating an electronic versus not creating an electronic portfolio</td>
</tr>
<tr>
<td>Electronic Portfolios</td>
<td>Digitized collection of artifacts, including demonstrations, resources, and accomplishments that represent an individual, group, community, organization, or institution</td>
<td>A system or process that creates a portfolio electronically; examples include PASS-Port, LiveText, TaskStream, or websites.</td>
</tr>
<tr>
<td>Impact</td>
<td>To have a direct effect</td>
<td>An improvement to the benefit of the new teacher</td>
</tr>
<tr>
<td>LaTAAP</td>
<td>The Louisiana Teacher Assistance and Assessment Program</td>
<td>A program for new teachers entering service for the first time in a Louisiana public school system.</td>
</tr>
<tr>
<td>Mentor</td>
<td>Someone who will guide a new teacher through the LaTAAP program.</td>
<td>An teacher with at least two years experience teaching with a school system, has completed the Louisiana Teacher Assessor and Mentor Training Program, and is willing to participate as a mentor for a new teacher</td>
</tr>
<tr>
<td>Preservice Teacher</td>
<td>A student who is in a teacher education program at an university</td>
<td></td>
</tr>
<tr>
<td>Principal</td>
<td>A person in charge of a school</td>
<td>A person in charge of a school who evaluated a teacher within LaTAAP</td>
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Table 1.1 (continued)
Definitions

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<th>Terms</th>
<th>Conceptually</th>
<th>Operationally</th>
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<tr>
<td>Reflective</td>
<td>The ability to be involved in deep and serious thought</td>
<td>The ability to reflect on a lesson or unit taught by the teacher and provide reason for success or failure of lesson.</td>
</tr>
<tr>
<td>Teaching Competencies</td>
<td>The skills, knowledge and dispositions to teach</td>
<td>The skills, knowledge, and dispositions that are necessary for a teacher to be effective</td>
</tr>
<tr>
<td>Technology Integration</td>
<td>The ability to integrate technology</td>
<td>The ability to integrate technology into lessons and activities completed by the teacher</td>
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With increasing demands by accrediting bodies for documentation of acceptable practices by teacher education programs, institutions have sought to find ways to effectively document their activities while also providing benefit for students and faculty. Teacher education programs have used a variety of assessments to evaluate the knowledge, skills, and dispositions of teacher candidates. In recent years, however, teaching competencies have been increasingly assessed through performance assessments such as simulations and portfolios (Van Der Schaaf, Stokking, & Verloop, 2003). Today, using just observations and knowledge examinations are simply not enough to provide sufficient evidence that a candidate is prepared to start teaching.

With the need for alternative assessment tools, universities started using portfolios as a form of performance assessment to help with the development and growth of the pre-service teacher and the overall teaching profession (Bird, 1990). As technology progressed, virtual learning environments started to be used to help with facilitation of learning (McGill & Hobbs, 2007). With those learning environments came the use of electronic portfolios. With electronic portfolios, the portfolio came with its own unique uses and benefits. Studies began to be conducted looking at the benefits for the university and the pre-service teachers who were using them. Yet, these studies focused on the immediate impact and not the impact beyond the teacher education program. This chapter reviews the literature on the theoretical and conceptual background of portfolios and electronic portfolios in general and teacher education. The goals of this review are to

1. Establish the conceptual background of assessments within teacher education;
2. Establish the background of portfolios in general and their use in teacher education;
3. Establish the background of virtual learning environments and their connections to teacher education and portfolios;

4. Establish the conceptual background of electronic portfolios;

5. Establish the connections of electronic portfolio in teacher education with reflective processing, teaching competencies, and technology integration; and

6. Describe the hypothesis.

Assessments in Teacher Education

In order to understand the elements of electronic portfolios in teacher education and their use, it is necessary to look back and return to the core of the use of portfolios themselves. Assessments have been as much a part of education as teaching itself. Webster’s Dictionary (2008) defined the root word “assess” as “to determine the importance, size, or value of.” In its essence, assessments place a value to the knowledge a person has and defines if that value is enough to continue learning. In teacher education, assessments are “…a tool to ascertain whether teachers satisfy the required competencies and to formulate guidelines for professional development” (Van Der et al, 2003, p. 395).

In order to have assessments, standards for which these assessments can be derived must to be established. In teacher education, two sets of standards have been used as the foundation for which assessments are done: the standard developed by the Interstate New Teacher Assessment and Support Consortium (INTASC) and standards developed by the National Council for the Accreditation of Teacher Education (NCATE).

INTASC standards. Created in 1987, INTASC is a consortium of state education agencies and national education organizations committed to the reform of preparing, licensing, and professional development of teachers (INTASC, 2008). The Louisiana Department of Education
was one of the first members of INTASC. In 1992, INTASC published standards that were to be used as a “common core of teaching knowledge and skills that should be acquired by all new teachers” (INTASC, 1992, p. 6). INTASC developed ten standards which detailed the knowledge, skills, and disposition that all new teachers should have before entering the profession. These standards range from understanding central concepts to being reflective in teaching. One of the key elements within the discussion of the standards is that the standards are performance-based (INTASC, 1992). As the Consortium states, “…performance-based licensing standards should enable states to permit greater innovation and diversity in how teacher education programs operate by assessing their outcomes rather than their inputs or procedures” (INTASC, 1992, p.7). These standards have been accepted by other states and other organizations and are the basis for new teacher programs.

NCATE standards. Founded in 1954, NCATE is the accrediting body established by other notable organizations to “help establish high quality teacher, specialist, and administrator preparation” (NCATE, 2008, p. 1). NCATE currently has over 600 institutions accredited through their organization. Since the time of its creation, NCATE has provided the standards to which accredited universities follow concerning the development of teachers in undergraduate and graduate programs. NCATE has established six standards which provide guidance to receive accreditation from the organization (NCATE, 2008, p.12). As part of their vision for the 21st century teacher, NCATE set forth and changed the standards to reflect the ever-changing society of which new teachers were becoming a part. One of the changes emphasized by NCATE was the need to “administer multiple assessments in a variety of forms, engage in follow-up studies, and use the results to determine whether candidates meet professional standards and whether graduates can teach so that students learn” (NCATE, 2008, p. 3). With this emphasis on variety
of assessments, institutions began to consider performance-based assessments (Schmid & Kiger, 2003; Galluzo, 2005; Song, 2006; Ledoux & McHenry, 2006).

**Portfolios**

The idea for the use of portfolios in education started emerging in the late 1980s with the Teacher Assessment Project at Stanford (Pecheone, et al., 2005). The project was a three-year, $2.5 million dollar project to “develop a new generation of assessments for teaching” (Gursky, 1989, p.1). The multi-phased project served to develop a performance-based assessment that would later be used to develop the assessments for the National Board for Professional Teaching Standards (NBPTS) (Pecheone et al., 2005). Lee Shulman, the director of the project at the time, believed that all forms of assessments used at that time (written tests, classroom evaluations, portfolios, and assessment centers) had weaknesses (Gursky, 1989). However, Shulman believed that the mixture of these varieties of assessments could be an accurate reflection of teaching (Gursky, 1989).

Eventually, more studies started to focus on the use of portfolios as an assessment tool. King (1991) reported that teachers a year after they were part of a portfolio program showed that the assessment influenced their teaching practices for the better. Other studies at this early stage showed that “portfolio development, structured exercises that stimulate teaching tasks, and formal interviews that probe teachers’ thinking can measure differences between pedagogical thinking, analysis and skills of accomplished teachers” (Pecheone et al., 2005, p. 4).

In the mid 1990s, studies started being published concerning those who developed a portfolio within the NBPTS process. Teachers were positive about the portfolio because it allowed them to critically examine their teaching and to analyze the decisions they made on a daily basis (Tracz et al., 1995). However, the questions have been raised about the reliability of
the artifacts because “teachers know they will be evaluated on the basis of these artifacts for their ‘reflectivity’ (Pecheone et al., 2005, p. 3).

As time progressed, states started requiring demonstrations in a teaching portfolio of an acceptable level of proficiency on a set of standards. These portfolios required a variety of artifacts to satisfy these standards. These artifacts included photographs, student assessments, projects and teaching samples. Zeichner and Wray (2001) argued that while this variety can be helpful, states need to “take advantage of their potential for promoting meaningful teacher growth and giving us better insights into prospective teachers’ teaching as we assess it” (p. 620).

**Virtual Learning Environments**

With the emergence of high speed computing, educators began to seek ways to harness its potential in the teaching and learning. Eventually, virtual learning environments (VLEs) were introduced into education. These VLEs were designed to support students in their learning and instructors in their teaching (McGill & Hobbs, 2007). The VLEs processed, stored, and disseminated educational material and supported communication associated with teaching and learning (McGill & Hobbs, 2007). The VLEs, in their original form, had the student as an end-user in which the student would access and interact with the VLE, such as chatting, taking quizzes, and reading content. The instructor would play a dual role in the VLE where he or she would provide the content for the course within the VLE and also interact with the VLE as a user (McGill & Hobbs, 2007). Forms of this type of VLE are systems such as WebCT, Blackboard, and Moodle.

However, as the technology has advanced, a different form of VLE has started being implemented called a student-centered, technology rich learning environment. This form of VLE focuses on students’ past experiences and stimulation of higher-order thinking (Hirumi, 2002).
This form of learning environment is designed for student learning and performance by using more constructivist approaches. Within the past ten years, electronic portfolios systems such as TaskStream, PASS-Port, and LiveText are types of student-centered environments. The students make the decisions on what to create within the environment. The students must decide what artifacts are best suited for a portfolio and must provide access for the instructor or evaluator to review the portfolio in question. The portfolio system is student-centered where other environments such as Blackboard are more traditional VLEs.

**Electronic Portfolios**

As technology progressed, performance-based assessment started transitioning to becoming part of the digital age. One of those to transition was portfolios. Electronic portfolios are digital collections of artifacts that can represent an individual, group, community, organization, or institution (Lorenzo & Ittelson, 2005). These forms of portfolios can have multimedia such as video or audio and can be placed on electronic media such as CDs or DVDs, or can be placed on a website (Lorenzo & Ittelson, 2005). Challis (2005), Abrami and Barrett (2005), Strudler and Wetzel (2005), and Bulter (2006) defined differences between electronic portfolios and traditional portfolios. Electronic portfolios

- Are easier to search and records can be retrieved, manipulated, refined and reorganized;
- Can use more extensive material;
- Include picture, sound, animation, graphic design and video;
- Are instantly accessible;
- Allow for quick feedback;
- Enable the creator to use a variety of technology skills.
Electronic portfolios began being used in the 1990s with students in higher education for the purposes of showcasing and reflecting on what they had learned (Lorenzo & Ittelson, 2005). The first to use electronic portfolios were students in colleges of education program. However, other disciplines such as business, nursing, medicine, and engineering soon began using electronic portfolios as a way to show students’ learning experiences and skills (Lorenzo & Ittelson, 2005; Butler, 2006).

Different types of electronic portfolios are developed and serve different purposes. Process portfolios are used as a collection of student work that shows the student’s effort, progress and achievement within the field (Abrami & Barrett, 2005). Showcase portfolios are used to demonstrate workplace skills while assessment portfolios are used to evaluate and judge, such as a summative assessment of learning (Abrami & Barrett, 2005). The use of the different types is dependent on the purpose of the end user.

As electronic portfolios started being used more, electronic portfolio systems started being used to help with the maintenance of artifacts and the provision of some support for the end user (Hall & Kiggins, 2005). Systems such LiveText, TaskStream, iWebfolio, and PASS-Port became available in the 2000s to help with this need of support and ease of storage.

**Electronic Portfolios in Teacher Education**

As electronic portfolios started being used in other fields, education started transitioning from the use of paper-based portfolios to electronic portfolios. The use of this form of portfolio method allowed pre-service teachers to demonstrate problem-solving and critical thinking skills using authentic and performance-based assessments (Campbell et al., 1997; Meyer, 1992). As research started being developed concerning the use of electronic portfolios, studies found that electronic portfolios had some inherent advantages over traditional paper-based portfolios.
Barrett (1997) argued that electronic portfolios allowed students to demonstrate problem solving skills as well as ownership of their learning. Campbell, et al. (1997) stated that students received some form of control over learning and the process of becoming a professional. While studies have been conducted about the overall value of electronic portfolios in teacher education and the implementation process, they have also focused on the impact of portfolios on reflective processing, technology integration, and teaching competencies.

Reflective processing. Just as with paper-based portfolios, students are encouraged “to reflect on their work and their reasons for choosing certain pieces to be incorporated in their portfolio” (Butler, 2006, p. 11). Pre-service teachers use reflection to integrate their learning experience and find meaning in their work (Lorenzo & Ittleson, 2005).

However, Barak (2005) found issues with reflecting within the electronic portfolio. Barak’s study focused on the issue of reflection within the artifacts of electronic portfolios using a qualitative method of across-case inductive analysis. Three types of reflection were defined and assessed within the study. First was descriptive reflection, which provides reasons based upon personal judgment (Barak, 2005). The study found that descriptive reflection was the prevalent form of reflection used with the majority of artifacts. Eighty percent of the entries within the portfolios and 100% of all portfolios had some form of descriptive reflection. Second, dialogic reflection concerned “a form of discourse with oneself, whereby the practitioner engages in introspection of possible reasons for his/her actions” (Barak, 2005, p. 35). About seven percent of the entries within the portfolio had some form of dialogical entries. The study showed the entries showing dialogical reflection “managed to convey a more elaborate, multifaceted, and insightful portrayal” of the experience of the portfolio, not necessarily about the experience of the teaching (Barak, 2005, p. 35). Finally, critical reflection involved
“exhibiting accounts of learning at interpretative, critical, moral or ethical levels” (Barak, 2005, p. 36). According to Barak, this form of reflection is the “untold” part of the portfolio and not discussed by those who create the portfolio. The entries of the portfolios depicted “the experience as favorable, avoiding confrontation and scrutiny” (Barak, 2005, p. 36). The study, in the overall picture, found forms of reflection done by those who completed an electronic portfolio; however, the level of reflection done by those who completed one is what could be defined as a very low level of reflection.

Technology integration. Another aspect of electronic portfolios in teacher education that has been examined is their use towards technology integration. Teachers have to be more adequately prepared with technology and students are increasingly accustomed to using technology. The International Society of Technology in Education (ISTE) in 2000 developed the National Educational Technology Standards (NETS) to help “measure proficiency and set aspirational goals for the knowledge, skills, and attitudes needed to succeed in today’s Digital Age” (ISTE, 2008). These standards are divided into student, teacher, and administrator sections. These standards were updated in 2007 for students and 2008 for teachers to be more reflective of the ever changing forms and use of technology. The NETS for students focuses on six areas: creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts (ISTE, 2008). Various states, including Louisiana, have adopted these standards as part of their technology standards and requirements for their students.

There is some evidence that electronic portfolios can promote technology integration. Kariuki, Franklin, and Duran (2001) found that by using electronic portfolios, teacher educators can serve as models of technology use while allowing students to apply their skills. Teacher
education students who use technology more become more comfortable with technology and are more likely to use technology within their current and future classrooms (Goldsby & Fazal, 2000; McKinney, 1998). Christensen and Knezek (2001) go further in suggesting that teachers who can successfully integrate technology have the necessary attitude, skill, and tools.

One major study related to technology integration with electronic portfolios was done by Barlett and Sherry in 2004. This study focused on the impact that creating an electronic portfolio had on pre-service teachers who, according to the authors, were “non-technology-savvy” students. The preservice teachers were required to develop an electronic portfolio demonstrating a variety of artifacts including documents, still images, and video clips of their classroom instruction. Upon immediate completion of the electronic portfolio, the pre-service teachers were given a 72-item Likert scale survey to complete concerning their perceptions on the following topics related to the electronic process: the process itself, their learning, anticipated application (transfer), anticipated impact (results), technology/resources used during the process, feedback/grading, and their thoughts on the completed electronic portfolio. The responses were then analyzed using descriptive statistics, and conclusions were made based on the results.

Barlett and Sherry (2004) concluded the following:

1. Those surveyed believed the experience of creating electronic portfolios increased the likelihood they would use technology in their future employment.

2. Those surveyed had positive attitudes toward electronic portfolios once they created one.

3. Those surveyed learned a great deal from creating electronic portfolios and much of what learned was directly applicable to their teaching careers.
4. It is possible for non-technology savvy students to complete a complex technology project, given adequate support.

5. Few pre-service teachers surveyed believed that they would make their own students do an electronic portfolio. The authors believed that more research needs to be conducted as to why pre-service teachers’ enthusiasm for electronic portfolio could carry into the teacher’s classroom use.

While the study found some evidence of a link of portfolios with technology integration, the teachers involved were not practicing educators. There is a need to determine if use of the portfolio had an impact on technology integration once teachers actually entered the classroom.

Teaching competencies. From the original development of portfolios in teacher education in the 1980s (Pecheone, et al., 2005), the main purpose of portfolios has been as an assessment of skills necessary to become an accomplished teacher. That main purpose has continued into the use for electronic portfolios. Love and Cooper (2004) found that electronic portfolios provided a “rich picture” of student learning and competencies. The use of electronic portfolios showed signs that students were making connections between their classroom projects and projects done as part of their field experiences (McDonald et al., 2004).

While research has examined electronic portfolios as a means of assessment of teaching competencies, research concerning the validity and reliability of electronic portfolios as an assessment tool has only recently began to appear. The Derham and DiPerna study (2007) was one of the first studies that examined the reliability and validity of the scores of electronic portfolios. The study examined portfolio scores versus various criteria such as PRAXIS I test scores, GPA, PRAXIS II test scores, etc. The study found a significant correlation between portfolio scores with GPA and PRAXIS II scores (Derham&DiPerna, 2007). In a subsequent
study done by Yao et al. (2008), the validity of electronic portfolios was looked more in-depth using Messick’s concept of construct validity, which focuses on six elements: content, substantive, structural, external, generalizability, and consequential validity. The study concluded that generalizability and substantive validity were high (Yao et al., 2008).

Beyond the current studies. Many of the studies examined consistently questioned one area yet to be a focus of research. Yao et al. (2008) stated that there is a need to know “if the pre-service teacher will continue to use the same type of reflection in the profession” (p. 20). Yao et al. also wanted to see “the impact of the pre-service teacher’s portfolio on P-12 student learning” (2008, p. 20). Shephard and Hannafin (2008) stressed the need of research beyond the impact of electronic portfolios during pre-service training. Shephard and Hannafin stated, “Research is also needed that examines the longitudinal use and impact of e-portfolios as teachers transition from pre-service to induction programs, particularly regarding the support needed to transfer reflective practices and skills to in-service environments” (2008, p. 35).

Summary

In an effort to have a variety of assessments and to help satisfy the demands of new standards set by accrediting organizations and consortium, the use of performance-based assessments in teacher education has increased. One of these forms of assessment was portfolios. Portfolios started being used in the 1980s with the Stanford Teacher Assessment Project. The outcomes of the project affected the National Board for Professional Teaching Standards which, in turn, started using the portfolio as part of the assessment completed by teachers wanting to receive certification. With their use, portfolios started to be implemented in teacher education programs across the U.S.
As time progressed and governing bodies demanded more and better documentation, electronic portfolios emerged. These electronic portfolios were a form of virtual learning environments wherein students were able to create and develop portfolios using various forms of media and could store these portfolios on electronic media or online. Eventually, electronic portfolio systems, such as TaskStream and PASS-Port, were created. These electronic portfolios showed benefits with regard to teaching competencies, reflective processing, and technology integration. However, more research was needed to determine if the benefits extended beyond the pre-service years. More specifically, research is needed on the impact of electronic portfolios used during pre-service training on teaching competencies, reflective practice and technology integration once prospective teachers actually enter the classroom.

Hypotheses

Based on the aforementioned review of literature, the following hypotheses were investigated concerning the impact of electronic portfolios.

1. Teachers who completed an electronic portfolio during their pre-service program will integrate technology more in their classroom than those who did not create an electronic portfolio during their pre-service program.
2. Teachers who completed an electronic portfolio during their pre-service program will exhibit stronger reflective skills than those who did not create an electronic portfolio during their pre-service program.
3. Teachers who completed an electronic portfolio during their pre-service program will have higher scores concerning teaching competencies than those who did not create an electronic portfolio during their pre-service program.
Proposed Theoretical Model

In order to evaluate key factors, an understanding of the factors that contribute to those elements must exist. Many factors contribute to the evaluation of technology integration, content knowledge, and reflective processing. The following discussion describes the model by working on the connections of factors being assessed.

Research has explored connections of technology integration, content knowledge, and pedagogical knowledge. Based on Shulman’s (1986) idea that pedagogical knowledge and content knowledge are not mutually exclusive, Mishra and Keohler (2006) extended the connection to include technology knowledge. Mishra and Koehler argued that technology is part of the classroom and that teachers “have to learn new techniques and skills as current technologies become obsolete” (p. 1023). Mishra and Koehler proposed a framework that emphasized the “connections, interactions and affordances, and constraints between and among content, pedagogy, and technology” (p. 1025). The Technology, Pedagogical, and Content Knowledge (TPACK) approach displayed this interconnection among the three. (Figure 2.1.)

![Figure 2.1. Technological, Pedagogical, and Content Knowledge. The Relationship of the Three Elements and Their Overlap.](image)

Besides the three basic forms of knowledge (content, technology, and pedagogy), this new framework allowed for looking at other connections. The first of these new connections
was technological content knowledge (TCK) which involves “knowledge about the manner in which technology and content are reciprocally related” (Mishra & Koehler, p. 1028). Another was technological pedagogical knowledge (TPK) that involved “knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies” (Mishra & Koehler, p. 1028). An example would be being aware of Web 2.0 tools such as wikis and blogs and using strategies to effectively use these technologies with teaching. Technological pedagogical content knowledge (TPACK) was the merger of the three and defined the concept of good teaching with technology. Mishra and Koehler believe that “good content requires a thoughtful interweaving of all three key sources of knowledge:  technology, pedagogy, and content”. So, the two core elements of technology integration and content knowledge can be replaced with a more diversified component of TPACK (Figure 2).

![Figure 2.2. Hypothesized Relationship of Technology Integration and Content Knowledge Showing Factors to Evaluate.](image)

Shulman believed reflection is a process during which a teacher “looks back at the teaching and learning that has occurred, and reconstructs, reenacts, and/or recaptures the events, the emotions, and the accomplishments. It is that set of processes through which a professional
learns from experiences” (p. 19). As time has evolved, the idea of reflective practice began to emerge in teaching performance. Schon (1983) defined reflective practice as a process of studying one’s teaching methods and determining what works best for students. Various factors contribute to the evaluation of reflective practice (Figure 2.3).

Figure 2.3.Hypothesized Relationship of Reflective Processing and Factors Affecting Reflective Processing.

One element of reflective practice is tacit knowledge which Argyris and Schon described as knowing more than we can explain and more than behavior can show (1992, p. 10). Tacit knowledge involves using intuitive knowledge to improve one’s technique. The ability to reflect builds knowledge and improves the overall teaching ability. Another element involves practicing reflection through frequent field experiences. Calandra, Brantley-Dias, Lee, and Fox (2009) believed that reflecting on what is being observed can help make connections between what they need to learn and their prior knowledge of teaching. This connection, when discovered early, can facilitate more expertise, and reflect more in the moment of teaching.

Technical expertise contributes to reflective practice. It involves the constant practice of a certain operation or product (Orland-Barak, 2005). Finally, reflective practice involves
establishing meaningful connections between theory and practice. Orland-Barak (2005) believed that the connections provide a rationale for action. Both technical expertise and connections between theory and practice are based on the Aristotelian notion that requires skill, character development and openness to confront the particularities of a given situation (Benner, 1984).

With the relationships established, the elements can be connected together (Figure 4). The model shows the relationships of the factors being evaluated and the factors that were assessed to predict the impact of electronic portfolios within the three major areas.

Figure 2.4. Hypothesized Model of Evaluation Factors.
CHAPTER 3
STUDY METHODS AND DESIGN

Participants

Three groups of participants were targeted for this study. The first group consisted of teachers who completed the third semester or the entire requirements of the Louisiana Teacher Assistance and Assessment Program (LaTAAP). All teachers who graduated from teacher preparation program and were hired by a Louisiana public school system are required to participate in this program. This program requires that teachers complete an electronic portfolio and that they be observed by a principal or administrative leader of the school in which they work as well as a trained district observer. In the LaTAAP program during the first year of employment, the new teacher is provided guidance and is assisted by a mentor teacher. The second year is the assessment year wherein new teachers complete a portfolio of their teaching ability and are observed for evaluation purposes by the administrator at the school and the outside designee of the school district. Every year, approximate 2,000 teachers completed the LaTAAP program. For the current study, teachers who completed the program in 2008 constituted the target population.

The second group of participants targeted for this study consisted of the mentor teachers of the teachers involved in the LaTAAP program. To qualify to be a mentor teacher within LaTAAP, a teacher must have a permanent Louisiana teaching certificate, a minimum of three years of teaching experience, have successfully completed the Louisiana Teacher Assessor and Mentor Training Program, and have a willingness to be observed in the classroom. These mentor teachers would have been with the teachers through the entire two year process and would be able to give perspective of the teacher’s growth through the process. Each teacher had
one mentor teacher. The mentor teacher can have only one teacher at a time during the LaTAAP process.

The final group of participants for this study consisted of the principal or administrator who evaluated the new teacher. The administrator would have evaluated the teacher in fewer observations and would have perspective from an administrator view.

**Research Design**

The study looked at the perspectives of new teachers towards technology use, teaching competencies, and reflective processes with the comparison occurring between those who completed an electronic portfolio during their pre-service training and those who did not. Mentor teachers and administrators were questioned concerning their perspective of the new teacher concerning technology use, teaching competencies, and reflective processes. The overall question was does a statistical difference exist between those teachers who have completed an electronic portfolio and those who have not. Since the possible pool of teachers was over 2,000 and those teachers had a mentor teacher and administrator and since there are over sixty school districts in the state of Louisiana, each with some number of new teachers, a survey design was used. However, in addition to the answers to the surveys, scores received on the LaTAAP portfolio were used as a separate instrument of assessment. The LaTAAP portfolio score consisted of the combined scores of the administrator of the school and a school district designee who evaluated a portfolio containing lessons and activities completed by the new teacher during the LaTAAP semesters.

In order to protect student participants, an application to the Institutional Review Board of Louisiana State University was made in advance of the commencement of data collection. As
all of the students in the study were adults and no personal or professional risk was anticipated for research participants, the researcher completed an application for exemption of oversight from the Institutional Review Board and received approval (see Appendix A). Other ethical considerations including protecting the privacy and confidentiality of program participants were known to the researcher only.

Procedures

Sample selection. The seventy school districts in Louisiana were contacted to receive permission to conduct the study (see Appendix B). Seventeen school districts granted permission (see Table 3.1). These districts represented eighteen percent of the teacher population in Louisiana. The number of teachers surveyed in each district was proportionate to the teacher population size of each district. The districts were contacted and a request for email addresses of teachers who had completed the LaTAAP program was made.

To entice teachers to complete the survey, a drawing for a gift certificate was conducted. As part of the survey, the teachers were asked if they had completed an electronic portfolio during their pre-service training. The teachers were split into those who had and those who had not completed an electronic portfolio. Once sufficient surveys completed by the teachers were received, a random sample was conducted of those teachers who had completed the survey. From those selected in the sample, a letter was sent to the mentor and administrator of each teacher selected. The administrator’s and mentor’s letter requested that they complete a survey on the teachers in question (see Appendix D and E).
Table 3.1
School Districts Providing Permission and Sample Size

<table>
<thead>
<tr>
<th>Parish</th>
<th>Teacher Population</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascension</td>
<td>1355</td>
<td>350</td>
</tr>
<tr>
<td>Caldwell</td>
<td>136</td>
<td>50</td>
</tr>
<tr>
<td>Catahoula</td>
<td>120</td>
<td>40</td>
</tr>
<tr>
<td>Central Community School System</td>
<td>270</td>
<td>70</td>
</tr>
<tr>
<td>City of Monroe</td>
<td>643</td>
<td>160</td>
</tr>
<tr>
<td>Concordia</td>
<td>260</td>
<td>70</td>
</tr>
<tr>
<td>DeSoto</td>
<td>379</td>
<td>90</td>
</tr>
<tr>
<td>Franklin</td>
<td>213</td>
<td>50</td>
</tr>
<tr>
<td>LaSalle</td>
<td>181</td>
<td>50</td>
</tr>
<tr>
<td>Natchitoches</td>
<td>473</td>
<td>120</td>
</tr>
<tr>
<td>Ouachita</td>
<td>1322</td>
<td>300</td>
</tr>
<tr>
<td>Rapides</td>
<td>1671</td>
<td>400</td>
</tr>
<tr>
<td>St. Helena</td>
<td>57</td>
<td>30</td>
</tr>
<tr>
<td>St. John the Baptist</td>
<td>467</td>
<td>100</td>
</tr>
<tr>
<td>St. Mary</td>
<td>695</td>
<td>150</td>
</tr>
<tr>
<td>Union</td>
<td>159</td>
<td>60</td>
</tr>
<tr>
<td>Washington</td>
<td>362</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8763</strong></td>
<td><strong>2190</strong></td>
</tr>
</tbody>
</table>


*Data collection.* To obtain the data from teachers, mentor teachers, and administrators, the letter requesting their participation contained instructions to access an online survey. All of the surveys used were built based on the survey created by Mishra and Koehler (2006) and covered all areas in question within the study: technology integration, reflective processing, and teaching competencies. Mishra and Koehler developed their survey based on the elements of their TPACK approach. In each section of their survey, respondents were asked questions related to their ability to complete various tasks as they related to the concept being discussed. For example, in the content knowledge section, respondents were asked questions about knowledge and skills related to key content areas: mathematics, social studies, science, and literacy. The survey began with questions focusing on the individual elements of technology knowledge,
content knowledge, and pedagogical knowledge. From there, the survey asked questions combining two of the three elements together; for example, one section combined technology and content knowledge. The final questions from the Mishra and Koehler’s survey combined all three elements and asked questions concerning skills related to combining those elements. Schmidt, et al (2010) completed a study on the reliability of the instrument and the results from that study can be found in Table 3.2. Mishra and Koehler’s survey was the best evaluation of all of the elements being addressed within this study so the survey was used with elements added.

Table 3.2
Reliability Results from Schmidt, et al. Study (2010)

<table>
<thead>
<tr>
<th>TPACK Domain</th>
<th>Internal Consistency (alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Knowledge (TK)</td>
<td>.82</td>
</tr>
<tr>
<td>Content Knowledge (CK)</td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td>.85</td>
</tr>
<tr>
<td>Mathematics</td>
<td>.84</td>
</tr>
<tr>
<td>Science</td>
<td>.82</td>
</tr>
<tr>
<td>Literacy</td>
<td>.75</td>
</tr>
<tr>
<td>Pedagogy Knowledge (PK)</td>
<td>.84</td>
</tr>
<tr>
<td>Pedagogical Content Knowledge (PCK)</td>
<td>.85</td>
</tr>
<tr>
<td>Technological Pedagogical Knowledge (TPK)</td>
<td>.86</td>
</tr>
<tr>
<td>Technological Content Knowledge (TCK)</td>
<td>.80</td>
</tr>
<tr>
<td>Technological Pedagogical Content Knowledge (TPACK)</td>
<td>.92</td>
</tr>
</tbody>
</table>

The survey was created using Survey Monkey, an online survey hosting platform. The teachers received the address of http://www.portfoliosurvey.com while the mentors and administrators were requested to access the address of http://www.foliosurvey.com. The completed surveys for teachers and mentors/administrators are included in Appendix F and G.

The teacher survey initially provided a consent statement for the completers of the survey to accept. Then, teachers were asked for demographic information such as: gender, certification, age, years of teaching experience, grade level teaching, school location, school population, university graduated from, type of program completed (traditional, alternative certification,
PREP), completion of an electronic portfolio, form of portfolio system used, type of portfolio created. Section two of the survey asked teachers to provide their LaTAAP background and their scores related to key items that only were evaluated during the electronic portfolio process. Section three pertained to the elements of TPACK. Each section asked questions pertaining to their use of certain skills or abilities. The questions were designed as a five option Likert scale. At the end of each section, a question was asked for the teachers to provide an example of their use of that overall topic. Section four of the survey asked Likert-scale questions concerning models that exhibited examples of the TPACK elements along with the percentage of their professors and colleagues that exhibited the TPACK elements. Section four of the survey also focused on the reflective processing conducted by the new teacher. In this section, each teacher was asked questions concerning the different ways in which he or she reflects on his or her teaching. The questions focused on the three types of reflection discussed in the review of literature: descriptive reflection, dialogic reflection, and critical reflection. Teachers were asked to select, from a series of text, the forms of reflecting that they use within their teaching. For example, a descriptive reflection choice would be one where they chose something because of their personal judgment; while a critical reflection choice would focus on a moral or ethical decision. The final section asked teachers about electronic portfolios in general and how the portfolio helped improve their ability of teaching, technology integration and content knowledge.

Every effort was made to include as many participants as possible in the completion of the survey. In order to facilitate survey participation, the research employed tactics similar to those used in many quantitative works. These tactics included

1. a personalized appeal for participation,
2. a reminder sent after the initial request,
3. an easy to read and complete survey instrument, and
4. a small enticement to encourage completion.

Final response rates were 228 teacher responses. Survey participants met the following classifications: gender -- 41 men and 187 women; years of experience -- 15 with less than one year’s experience, 11 with 1 year experience, 16 with 2 years experience, 10 with 3 years experience, 10 with 4 years experience, and 166 with 5 years or more experience; grade levels teaching at the time of the survey -- 142 were teaching grades Pre-Kindergarten through eighth grade, 86 were teaching grades ninth through twelfth; use of electronic portfolio during college program -- 74 had created an electronic portfolio, 152 had not created an electronic portfolio.

Table 3.1 provides the demographic information for the teacher participants.

Table 3.3
Demographic Information on Teachers

<table>
<thead>
<tr>
<th>Grouping Category</th>
<th>Demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>187-females</td>
</tr>
<tr>
<td></td>
<td>41-males</td>
</tr>
<tr>
<td>Years Experience</td>
<td>15- Less than 1 year</td>
</tr>
<tr>
<td></td>
<td>11- 1 year</td>
</tr>
<tr>
<td></td>
<td>16- 2 years</td>
</tr>
<tr>
<td></td>
<td>10- 3 years</td>
</tr>
<tr>
<td></td>
<td>10- 4 years</td>
</tr>
<tr>
<td></td>
<td>166- 5 years or more</td>
</tr>
<tr>
<td>Grade Levels</td>
<td>142- Pre-K through 8th grade</td>
</tr>
<tr>
<td></td>
<td>86- 9th through 12th grade</td>
</tr>
<tr>
<td>Population of School Teaching</td>
<td>1- 0 to 99 students</td>
</tr>
<tr>
<td></td>
<td>11- 100 to 249 students</td>
</tr>
<tr>
<td></td>
<td>63- 250 to 399 students</td>
</tr>
<tr>
<td></td>
<td>43- 400 to 549 students</td>
</tr>
<tr>
<td></td>
<td>45- 550 to 699 students</td>
</tr>
<tr>
<td></td>
<td>21- 700 to 849 students</td>
</tr>
<tr>
<td></td>
<td>14- 850 to 999 students</td>
</tr>
<tr>
<td></td>
<td>30- 1000 and over students</td>
</tr>
<tr>
<td>Educational Program Completed</td>
<td>145- Traditional 4-year education program</td>
</tr>
<tr>
<td></td>
<td>38- Alternative Certification Program</td>
</tr>
<tr>
<td></td>
<td>20- Practitioner Teacher Program</td>
</tr>
<tr>
<td></td>
<td>25- Other</td>
</tr>
</tbody>
</table>
Table 3.3 (Cont.)
Demographic Information on Teachers

| Use of Electronic Portfolio during College Program | • 76- Yes  
|-----------------------------------------------|-----------------------------------------------|
|                                              | • 152- No  
| Colleges of Teachers Who Completed a Portfolio during Preservice | • 1-Centenary  
|                                              | • 6-Louisiana State University  
|                                              | • 10-Louisiana Tech University  
|                                              | • 1- LSU-Alexandria  
|                                              | • 1- LSU-Shreveport  
|                                              | • 7- Nicholls State University  
|                                              | • 12- Northwestern State University  
|                                              | • 13- Southeastern Louisiana University  
|                                              | • 4- University of Louisiana- Lafayette  
|                                              | • 12- University of Louisiana- Monroe  
|                                              | • 4- Out of State  

The mentor teachers and administrators received a similar survey to complete. Their survey asked them to rate the teacher in question on the same three major categories discussed: technology integration, reflective processing, and teaching competencies. The demographic information asked them to identify the teacher in question in order the help with the data analysis. Section two asked the mentor teacher/administrator to rate the new teacher on the use of technology. The questions were a 5-point Likert scale concerning the effective use of various forms of technology. An example was: The teacher can learn technology easily, strongly disagree, disagree, neither agree nor disagree, agree, strongly agree. Section three of the survey asked the mentor teacher/administrator to rate the new teacher’s ability to reflect on his or her teaching. This section included questions on the various types of reflection: descriptive, dialogic, and critical.

Every effort was made to contact the mentor teachers and principals of the teachers who had completed an electronic portfolio. However, in some cases, the mentor teacher or principal was no longer working at the school where the teacher was located or the person in question had
retired from the school system. Therefore, the response rate of the mentor teachers and principals was extremely low. Upon the completion of the study, only three mentor teachers and four principals had completed the survey. A decision was made to exclude results of the mentor teachers and administrators surveys due to this low response rate.

**Summary**

The research method for this study was a quantitative study employing a survey of teachers within the state of Louisiana along with the mentor teachers and principals of those teachers. The purpose of employing this method was to broadly encapsulate the effect of electronic portfolios between those who had completed an electronic portfolio within their program and those who had not. Participants were surveyed online using a survey developed by Mishra and Koehler along with questions pertaining to their reflective abilities. From the pool of teachers, the mentor teachers and principals were contacted to evaluate the teachers on the same characteristics upon which the teachers evaluated themselves.
CHAPTER 4
RESULTS AND DISCUSSION

This study was intended to contribute information concerning the effect of electronic portfolios in teacher education towards technology integration, reflective skills, and teaching competencies. The results include a statistical analysis of the Technological Pedagogical and Content Knowledge (TPACK) survey used with added questions concerning reflection and the participants understanding of the different areas of TPACK. The results also include the comparison between mentor teachers, principals, and surveyed teachers. The statistical analysis included independent sample $t$-tests of the results.

To verify the reliability of the survey instrument, a reliability analysis was conducted using the participant’s data. The seven sections of questions regarding the parts of TPACK were separately calculated using the reliability analysis tool within SPSS. Further, the content section of the survey was broken into the four content areas examined: social studies, mathematics, science, and literacy. The results from the reliability analysis are shown in Table 4.1. The results of each section were above .70, which is used for reliability testing, so all elements of the survey were sound.

Table 4.1
Results from Reliability Analysis

<table>
<thead>
<tr>
<th>TPACK Domain</th>
<th>Internal Consistency (alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Knowledge (TK)</td>
<td>.93</td>
</tr>
<tr>
<td>Content Knowledge (CK)</td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td>.93</td>
</tr>
<tr>
<td>Mathematics</td>
<td>.91</td>
</tr>
<tr>
<td>Science</td>
<td>.85</td>
</tr>
<tr>
<td>Literacy</td>
<td>.95</td>
</tr>
<tr>
<td>Pedagogy Knowledge (PK)</td>
<td>.93</td>
</tr>
<tr>
<td>Pedagogical Content Knowledge (PCK)</td>
<td>.77</td>
</tr>
<tr>
<td>Technological Pedagogical Knowledge (TPK)</td>
<td>.88</td>
</tr>
<tr>
<td>Technological Content Knowledge (TCK)</td>
<td>.79</td>
</tr>
<tr>
<td>Technological Pedagogical Content Knowledge (TPACK)</td>
<td>.89</td>
</tr>
</tbody>
</table>
A factor analysis was also conducted to examine if the amount of variables observed could be reduced into smaller groupings. The 47 questions related to the elements of TPACK were selected for the analysis. The results from the initial factor analysis produced nine components accounting for 80.01% of the total variance within the study. When examining the factor loadings results, the nine components were identified and are shown in Table 4.2. When combining or reduction of the components was attempted, the variance was never any higher than displayed within the table.

Table 4.2
Results from Factor Analysis

<table>
<thead>
<tr>
<th>Component Element</th>
<th>% of variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1: Technology Knowledge</td>
<td>12.69%</td>
</tr>
<tr>
<td>Component 2: Pedagogical Knowledge</td>
<td>12.40</td>
</tr>
<tr>
<td>Component 3: Technological Pedagogical and Content Knowledge</td>
<td>8.90</td>
</tr>
<tr>
<td>Component 4: Science and Social Studies</td>
<td>8.43</td>
</tr>
<tr>
<td>Component 5: Literacy</td>
<td>8.34</td>
</tr>
<tr>
<td>Component 6: Mathematics</td>
<td>8.32</td>
</tr>
<tr>
<td>Component 7: Science</td>
<td>7.33</td>
</tr>
<tr>
<td>Component 8: Technological Pedagogical Knowledge</td>
<td>6.90</td>
</tr>
<tr>
<td>Component 9: Social Studies</td>
<td>6.70</td>
</tr>
</tbody>
</table>

Impact on Technological Knowledge

Section one of the TPACK survey (see Appendix F) related to knowledge in using technology. Questions involved asked the teachers about how well they solve technology problems (questions 27a), if they learn technology easily (question 27b), how they keep up with important new technologies (question 27c), how they frequently “play” with technology (question 27d), having knowledge about different forms of technology (question 27e), having the technology skills to use technology (question 27f), and having the opportunity to work with different forms of technology (question 27g). To allow for analysis using a statistical procedure, the participant responses for the various questions within question 27 were converted to number
values using the following procedure: Strongly Agree converted to a 5, Agree converted to a 4, Neither Agree nor Disagree converted to a 3, Disagree converted to a 2, and Strongly Disagree converted to a 1. The scores for each question part were totaled for each respondent.

Subsequently, an independent samples t-test was run on the data collected. To verify that there was equal variance on the dependent variable (technology knowledge scores), the Levene’s Tests for Equality of Variances was conducted. Equal variance can be assumed as the results were higher than the statistical significance amount needed of .05. The results show that the difference between mean value of those who completed a portfolio (mean= 28.89, sd=4.806) and those who did not complete a portfolio (mean=26.23, sd=5.332) on the items related to satisfy with the current position, t(226)=2.658, as shown in Table 4.3.

Table 4.3
\( t \)-test Results of Technology Knowledge Totals

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>28.89</td>
<td>26.23</td>
</tr>
<tr>
<td>SD</td>
<td>4.806</td>
<td>5.332</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>2.658</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

Since statistical difference was reached, independent sample \( t \)-tests were conducted on the individual questions within the section. When satisfying the assumption of equal variance, question 27a, regarding knowing how to solve technical problems, and question 27g, concerning having sufficient opportunities to work with different technologies, could not be satisfied. For the other questions, a statistical significance existed with question 27b concerning learning technology easily, questions 27c concerning keeping up with important new technologies, question 27d concerning frequently playing around with technology, question 27e concerning the
use of different technology and question 27f concerning having the technical skills needed to use technology. The results of the individual questions can be found in Table 4.4.

**Impact on Content Knowledge**

Section two of the survey involved the teachers understanding of various forms of content knowledge. The section had 12 questions related to various subject areas: mathematics, social studies, science and literacy. To allow for analysis using a statistical procedure, the

Table 4.4

$t$-test Results of Technology Knowledge Questions

<table>
<thead>
<tr>
<th>$t$-test: Independent Samples for Means for Question 27b</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.46</td>
<td>4.08</td>
</tr>
<tr>
<td>SD</td>
<td>.651</td>
<td>.772</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>3.685</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$t$-test: Independent Samples for Means for Question 27c</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.06</td>
<td>3.68</td>
</tr>
<tr>
<td>SD</td>
<td>.893</td>
<td>.914</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>2.936</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$t$-test: Independent Samples for Means for Question 27d</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.18</td>
<td>3.80</td>
</tr>
<tr>
<td>SD</td>
<td>.883</td>
<td>.950</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>2.861</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.4 (continued)
t-test Results of Technology Knowledge Questions

$t$-test: Independent Samples for Means for Question 27e

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.75</td>
<td>3.48</td>
</tr>
<tr>
<td>SD</td>
<td>.996</td>
<td>1.004</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>1.832</td>
<td></td>
</tr>
<tr>
<td>T critical two tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

$t$-test: Independent Samples for Means for Question 27f

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.32</td>
<td>3.90</td>
</tr>
<tr>
<td>SD</td>
<td>.671</td>
<td>.875</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>3.587</td>
<td></td>
</tr>
<tr>
<td>T critical two tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

participant responses for the various questions within question 28 were converted to number values using the similar procedure as using with the technology knowledge section. Once converted, the scores were totaled to obtain a score for the section. Subsequently, an independent samples $t$-test was conducted on the scores. To verify that there was equal variance on the dependent variable (content knowledge scores), the Levene’s Tests for Equality of Variances was conducted. Equal variance can be assumed as the results from the test ($p=.108$) were higher than the set perimeter of .05. The results show that the difference between mean value of those who completed a portfolio (mean= 47.18, sd=6.968) and those who did not complete a portfolio (mean=46.28, sd=6.447) on the items related to content knowledge did not satisfy with the current position, $t(226)=.948$ as shown in Table 4.5.
When investigating the individual questions within the section, independent sample $t$-tests were conducted. When verifying the assumption of equal variance, questions 28b (using a mathematical way of thinking), 28e (using a historical way of thinking), 28f (having various ways of developing understanding of social studies), and 28l (having various ways of understanding literacy) did not pass the Lavene’s Test for Equality of Variances. As shown in Table 4.6, the results show, as it pertains to content knowledge, none of the questions showed a statistical significance between those who did complete a portfolio and those who did not.
Table 4.6 (continued)
t-test Results of Content Knowledge Questions

<table>
<thead>
<tr>
<th>t-test: Independent Samples for Means for Question 28c</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.86</td>
<td>3.79</td>
</tr>
<tr>
<td>SD</td>
<td>.915</td>
<td>.848</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>0.558</td>
<td></td>
</tr>
<tr>
<td>T critical two tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>t-test: Independent Samples for Means for Question 28d</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.90</td>
<td>3.87</td>
</tr>
<tr>
<td>SD</td>
<td>.958</td>
<td>.817</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>0.285</td>
<td></td>
</tr>
<tr>
<td>T critical two tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>t-test: Independent Samples for Means for Question 28g</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.72</td>
<td>3.63</td>
</tr>
<tr>
<td>SD</td>
<td>.929</td>
<td>.949</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>0.651</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>t-test: Independent Samples for Means for Question 28h</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.72</td>
<td>3.62</td>
</tr>
<tr>
<td>SD</td>
<td>1.031</td>
<td>.944</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>0.723</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.67</td>
<td></td>
</tr>
</tbody>
</table>
Impact on Pedagogical Knowledge

The pedagogical knowledge asked questions related to teaching and how to teach effectively. Questions involved their knowledge on assessment, teaching approaches, classroom management, and teaching styles. Scores for each question were combined to produce a total score and an independent samples *t*-test was conducted on the total scores. For the assumption of equal variances, the Levene’s Test was used and passed for equality of variance (p = .724). The
results show that the difference between mean value of those who completed a portfolio (mean=31.04, sd=3.191) and those who did not complete a portfolio (mean=30.88, sd=3.668) on the items related to pedagogical knowledge did not satisfy with the current position, t(226)=0.324, as shown in Table 4.7.

Table 4.7
_t-test_ Results of Pedagogical Knowledge Totals

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>31.04</td>
<td>30.88</td>
</tr>
<tr>
<td>SD</td>
<td>3.191</td>
<td>3.668</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>0.324</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

When examining the individual questions within the pedagogical knowledge section, all were examined using the independent samples _t_-test. All eight questions passed the assumption of equality of variances. However, once tested, all eight questions showed no statistical difference between those who had completed a portfolio and those who had not completed a portfolio.

**Impact on Pedagogical Content Knowledge**

In this section of the survey, the four questions focused on if the teachers knew how to find teaching approaches to guide student learning in four content areas: mathematics, literacy, science, and social studies. The scores from the questions were combined to obtain a total score for the section that would be used for statistical analysis. Also, each individual question was analyzed using the same statistical procedure. For the assumption of equal variance, both the total and the individual questions passed the Levene’s Test for Equality of Variance. The results
show that the difference between mean value of those who completed a portfolio (mean= 15.51, sd=2.898) and those who did not complete a portfolio (mean=15.11, sd=2.859) on the items related to pedagogical content knowledge did not satisfy with the current position, $t(226)=0.971$, as shown in Table 4.8. As for each of the questions within the section, all four questions showed no statistical difference between those who had completed an electronic portfolio and those who did not.

Table 4.8
$t$-test Results of Pedagogical Content Knowledge Totals

<table>
<thead>
<tr>
<th>$t$-test: Independent Samples for Means</th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>15.51</td>
<td>15.11</td>
</tr>
<tr>
<td>SD</td>
<td>2.898</td>
<td>2.859</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>$&gt;0$</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>0.971</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

Impact on Technological Content Knowledge

This section of the survey involved four questions concerning knowing how to use technology in the four content areas of mathematics, literacy, science, and social studies. Scores for each question were combined to create a total score for the section. The total score and the scores for the individual questions received the same statistical procedure with an independent samples $t$-test. Using the Levene’s Test for Equality of Variances, all assumptions for equality of variances were tested and met for the total score and the scores for the individual questions. The results show that the difference between mean value of those who completed a portfolio (mean= 15.15, sd=3.013) and those who did not complete a portfolio (mean=14.27, sd=2.995) on the items related to technological content knowledge did satisfy with the current position,
t(226)=2.053, as shown in Table 4.9. When examining the individual questions for the section, only the question regarding the use of technology for the understanding and doing of mathematics had a statistical difference between those who had completed a portfolio and those who did not (see Table 4.10).

Table 4.9  
_t-test Results of Technological Content Knowledge Totals_

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>15.15</td>
<td>14.27</td>
</tr>
<tr>
<td>SD</td>
<td>3.013</td>
<td>2.995</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>2.053</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.10  
_t-test Results of Technological Content Knowledge Question_

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.83</td>
<td>3.51</td>
</tr>
<tr>
<td>SD</td>
<td>0.985</td>
<td>0.991</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>2.272</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

**Impact on Technological Pedagogical Knowledge**

This section involved five questions related to choosing and effectively using technology to enhance teaching in the classroom. Scores from this section were combined to calculate a total score for the section. The total score for the section and the individual scores for each question were tested using the same statistical procedures as previous sections. Using the Levene’s Test, the assumptions for equality of variances were met by the total score and each
individual question within the section. The results show that the difference between mean value of those who completed a portfolio (mean= 21.00, sd=3.291) and those who did not complete a portfolio (mean=19.95, sd=3.264) on the items related to technological content knowledge did satisfy with the current position, t(226)=2.246, as shown in Table 4.11. With regards to the individual questions within the section, only one question showed a statistical difference between the two groups. The question was related to the education program the teacher had and how it caused the teacher to think more deeply about how technology can influence the teaching approaches used in the classroom (see Table 4.12).

Table 4.11
\textit{t}-test Results of Technological Pedagogical Knowledge Totals

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.00</td>
<td>19.95</td>
</tr>
<tr>
<td>SD</td>
<td>3.291</td>
<td>3.264</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>2.246</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.12
\textit{t}-test Results of Technological Pedagogical Knowledge Question

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.97</td>
<td>3.49</td>
</tr>
<tr>
<td>SD</td>
<td>1.042</td>
<td>1.072</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>&gt;0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>3.168</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>
Impact on Technology Pedagogy and Content Knowledge

Teachers were asked eight questions regarding creating lessons that combined technology, teaching approaches, and the content area being taught. Questions also asked about providing leadership in helping others with the use of technology in teaching content. The scores from the section were combined to obtain a total score. The total score along with the scores for each individual question were tested using the same procedures. Concerning the assumption of equality of variances, the total score and all but one of the questions (question 40f, regarding using strategies that they learning in their course) met the assumption. The results show that the difference between mean value of those who completed a portfolio (mean= 32.15, sd=4.753) and those who did not complete a portfolio (mean=29.83, sd=5.421) on the items related to technological pedagogical and content knowledge did satisfy with the current position, $t(226)=3.107$, as shown in Table 4.13. With regards to the individual questions within the section, several of the questions showed a statistical difference between the two groups (see Table 4.14). Question 39a concerning lessons that combine technology, mathematics, and teaching approaches, question 39b concerning lessons that combine technology, literacy, and teaching approaches, question 39e concerning selecting technology that can enhance what and the teacher teachers and what a student learns, question 39g concerning learning in helping others to coordinate the use of content, technology and teaching at the school/district, and question 39h concerning technology that can enhance the content for a lesson showed a statistical difference between those who did and those did not complete an electronic portfolio.

Impact on Reflective Processing

The final section of the survey regarded ways in which the teachers reflect on their teaching. The participants received three questions on various types of reflecting with the same
Table 4.13
\textit{t}-test Results of Technological Pedagogical and Content Knowledge Totals

\textit{t}-test: Independent Samples for Means

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>32.15</td>
<td>29.83</td>
</tr>
<tr>
<td>SD</td>
<td>4.753</td>
<td>5.421</td>
</tr>
<tr>
<td>Participants</td>
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<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>$&gt;0$</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
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<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.14
\textit{t}-test Results of Technological Pedagogical and Content Knowledge Questions

\textit{t}-test: Independent Samples for Means for Question 39a

<table>
<thead>
<tr>
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<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.89</td>
<td>3.52</td>
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<tr>
<td>SD</td>
<td>0.934</td>
<td>0.997</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>$&gt;0$</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>2.654</td>
<td></td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

\textit{t}-test: Independent Samples for Means for Question 39b

<table>
<thead>
<tr>
<th></th>
<th>Completed Portfolio</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.10</td>
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<td>SD</td>
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<td>.888</td>
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<td>Participants</td>
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<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>$&gt;0$</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
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</tr>
<tr>
<td>T critical one tail</td>
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</table>

\textit{t}-test: Independent Samples for Means for Question 39e

<table>
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<tr>
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<tr>
<td>SD</td>
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<td>.717</td>
</tr>
<tr>
<td>Participants</td>
<td>71</td>
<td>157</td>
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<tr>
<td>Hypothesized Mean Difference</td>
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<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>3.573</td>
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</tr>
<tr>
<td>T critical one tail</td>
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</tr>
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</table>
Table 4.1 (continued)
t-testResults of Technological Pedagogical and Content Knowledge Questions

**t-test: Independent Samples for Means for Question 39g**

<table>
<thead>
<tr>
<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
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<tr>
<td>SD</td>
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<td>Participants</td>
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<tr>
<td>Hypothesized Mean Difference</td>
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<td>df</td>
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</tr>
<tr>
<td>t Stat</td>
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</tr>
<tr>
<td>T critical one tail</td>
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</tr>
</tbody>
</table>

**t-test: Independent Samples for Means for Question 39h**

<table>
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<tr>
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</thead>
<tbody>
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<td>Mean</td>
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<tr>
<td>Participants</td>
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<tr>
<td>df</td>
<td>226</td>
</tr>
<tr>
<td>t Stat</td>
<td>2.226</td>
</tr>
<tr>
<td>T critical one tail</td>
<td>1.65</td>
</tr>
</tbody>
</table>

five responses as in previous section. The first question was on their sense of descriptive reflection, the second on dialogic reflection, and the third on critical reflection. Since the questions dealt with three distinct styles of reflection, no total score was created for this section of the survey. Each question received the same statistical analysis as the previous section. Concerning the assumption of equality of variances, all three questions were tested and the assumption for each was met. The independent samples t-Test was conducted on each and the results showed that there were no statistical significant difference between those who had completed an electronic portfolio and those who had not (see Table 4.15).
Table 4.1
Results of Reflective Processing Questions

### $t$-test: Independent Samples for Means for Descriptive Reflection Question

<table>
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<tbody>
<tr>
<td>Mean</td>
<td>4.11</td>
<td>3.92</td>
</tr>
<tr>
<td>SD</td>
<td>0.688</td>
<td>0.906</td>
</tr>
<tr>
<td>Participants</td>
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<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>$&gt;0$</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>$t$ Stat</td>
<td>1.619</td>
<td></td>
</tr>
<tr>
<td>$T$ critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

### $t$-test: Independent Samples for Means for Dialogic Reflection

<table>
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<th>Completed Portfolio</th>
<th>Not Completed Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.25</td>
<td>4.10</td>
</tr>
<tr>
<td>SD</td>
<td>0.648</td>
<td>0.681</td>
</tr>
<tr>
<td>Participants</td>
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<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
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<td></td>
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<tr>
<td>df</td>
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<td>$t$ Stat</td>
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<td>$T$ critical one tail</td>
<td>1.65</td>
<td></td>
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</table>

### $t$-test: Independent Samples for Means for Critical Reflection

<table>
<thead>
<tr>
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<th>Not Completed Portfolio</th>
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</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.00</td>
<td>3.81</td>
</tr>
<tr>
<td>SD</td>
<td>0.926</td>
<td>0.871</td>
</tr>
<tr>
<td>Participants</td>
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<td>157</td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>$&gt;0$</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>$t$ Stat</td>
<td>1.504</td>
<td></td>
</tr>
<tr>
<td>$T$ critical one tail</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

**Summary**

Concerning the survey instrument, a reliability analysis indicated that each of the sections within the survey can be assessed consistently. Each of the seven sections within the survey resulted in a reliability coefficient higher than .70, which is more than required to be considered reliable. A factor analysis of the survey instrument established that there were nine elements that accounted for the large majority of the variance within the survey. Trying to consolidate the
elements within the factor analysis would cause a much larger amount of the variance within the survey not to be fully accounted.

Concerning the responses within the study, \( t \)-tests were conducted to question where there was a significant difference between those who had completed a portfolio and those who had not completed a portfolio. Although not all of the analyses performed on the quantitative data revealed significant results, the evidence provided by the survey responses indicates that the use of electronic portfolios does help in the aid of technology integration. When technology was a factor in the questions asked, a statistical difference existed between those who had done an electronic portfolio and those who had not done an electronic portfolio. Statistical significance was found for within the section of technology knowledge along with several questions regarding their perceived ability to use technology. Concerning pedagogical knowledge, overall results showed no significance difference between those who had and those who had not completed an electronic portfolio. With regard to content knowledge, results showed no statistical difference in the areas of literary, social studies and science. However, as it relates towards mathematics, there was a statistical difference in the perceived ability between those who had completed a portfolio and those who had not completed a portfolio. As for reflective processing, the results showed no significant between the two groups concerning their perceived ability to reflect on their teaching in the areas of descriptive, dialogic, and critical reflection. The results show that there is no harm in teachers having to complete an electronic portfolio as the difference between those who had completed an electronic portfolio and those who had not is statistically positive.
CHAPTER 5
SUMMARY AND CONCLUSIONS

Teacher education portfolios have shown value and impact on the use of portfolios for beyond the teacher education program. In a 2011 study, when school administrators were asked how much weight do you give a portfolio in the hiring process, 61% of those surveyed placed either some or a great deal of weight on the portfolio (Whitworth, Deering, Hardy, & Jones, p. 98). In the same study, when asked over the past five years, have you seen an increase in newly-graduated teachers submitting a portfolio, 59% of administrators said there were the same amount or some form of increase of submitting portfolios (Whitworth et al., p. 98). The students themselves see value in the creating of electronic portfolios beyond their programs as well. Regarding the question concerning weight a portfolio has in a hiring process, 53% of students surveyed placed some or a great deal of weight on the portfolio (Whitworth et al., p. 98).

In answer to the research question concerning does creating an electronic portfolio in preservice encourage technology integration in the teacher’s teaching, the research determined that those who had completed an electronic portfolio were significantly better in their use of technology and technology integration in the classroom. In the technological knowledge section, those who had completed an electronic portfolio had statistically higher scores within their combined scores and also when comparing individual questions within the section. Also, in sections of the survey when technology was an element, teachers who had completed a portfolio had scores that were statistical higher in those elements as well.

In answer to the research question concerning does an electronic portfolio in preservice enhance the perception of teaching ability, the research determined that having completed an electronic portfolio does not factor as an element in overall teaching ability. In the pedagogical section of the survey, while the total score for the group who had completed a portfolio was
higher, the difference between the two groups was not statistically significant. Even in the other sections in which pedagogy was a factor, teachers who had completed a portfolio had higher scores but the difference was not statistically significant.

In the answer concerning does creating an electronic portfolio in preservice develop reflective skills, the researcher could not determine statistical impact of electronic portfolios on reflective processing. With regard to each of the three types of reflective processing (descriptive, dialogic, and critical), those who had completed an electronic portfolio scored themselves higher than those who had not completed an electronic portfolio. In a 2012 study, Thomas and Liu found that prospective teacher, in general reflect “in a fairly positive way on their teaching and learning” (p. 324). The authors entitled this positive demeanor “sunshining process” (p. 324).

Overall, no statistical difference existed in content knowledge between the two groups except in the area of mathematics. When responding to questions related to mathematics, those who had completed an electronic portfolio had significantly higher scores than those who had not completed an electronic portfolio.

The information collected and provided in this project establishes clearly that electronic portfolios can be an effective tool in teacher education programs, and no determent to having electronic portfolios completed during the preservice years is apparent. Furthermore, completion of electronic portfolios aids in the encouragement of technology integration with in the classroom.

**Implication for Practice**

While some colleges and universities are still using electronic portfolios as part of their assessment system for accreditation, the state of Louisiana no longer uses electronic portfolios as part of their teacher evaluation program. With the enactment of Act 54, the state of Louisiana
requires performance at every level of K-12 public education to be based on student growth ("About Act 54", 2013). As part of the assessment, the State developed a new model for evaluation called COMPASS, which stands for Clear, Overall Measure of their Performance to Analyze and Support Success. The use of electronic portfolio is not part of the model created. The results from the research project show that there would be no harm or advantage for using electronic portfolios in this form of assessment. College and universities can use the artifacts and data from the electronic portfolios as documentation for their accreditation.

Nationally, the Stanford Center for Assessment, Learning and Equality (SCALE) partnered with the American Association of Colleges for Teacher Education (AACTE) to develop and share edTPA, formerly the Teacher Performance Assessment (2013). The electronic portfolio-based assessment includes a review of a teacher candidate’s teacher materials that demonstrates each candidate’s ability to effective teach subject matter to students. Currently, four states participated in edTPA and have implementation policies in place (Tennessee, Minnesota, New York, and Washington). Another four states (Illinois, Massachusetts, Ohio, and Wisconsin) have implementation policies pending. Electronic portfolio systems like TaskStream and PASS-Port have agreed to be providers for the edTPA platform (AACTE, 2013).

**Implications for Future Research**

This study contributed to the body of literature related to the impact of electronic portfolios on technology integration, reflective processing, and pedagogical knowledge. This research discovered a significant gap in the literature related to teachers after preservice and how their use of electronic portfolios has helped them. The gap was more so in the area of reflective processing and pedagogical knowledge. Several articles dealt with one of these elements but
never the combination of all three elements. No research completed on the effects after preservice.

This researcher specifically recommends that future studies explore the impact of electronic portfolios in teacher education in the United States. Additional work is also recommended to determine how mathematics is connected to electronic portfolios and their use. Results in this study indicate that those who did complete an electronic portfolio were different in their knowledge of mathematics from those who had not completed an electronic portfolio. Additional research can confirm or refute the impact this difference in mathematics may have. Finally, further quantitative research can be conducted on electronic portfolio and reflective process. The study completed had very few questions created regarding this issue and a more thorough study could look into the skills needed to be reflective within an electronic portfolio and how much reflective processing is involved in the creation of an electronic portfolio.
REFERENCES


APPENDIX A
INFORMED CONSENT FORM WITH IRB APPROVAL

SUBJECT CONSENT FORM

1. Study Title: A Quantitative Study Focusing on the Long Term Effect of Electronic Portfolios in Teacher Education

2. Performance Site: State of Louisiana

3. Investigator: The investigator is available for questions about this study, M-F, 8:00 a.m. – 4:30 p.m.
   Jarrod Sanson (318) 357-4004

4. Purpose of the Study: The purpose of the study is to determine the long-term effects of having preservice teachers create electronic portfolios during their teacher preparation program.

5. Student Inclusion: Individuals between the ages of 21 and 65 who are teachers in the state of Louisiana.

6. Number of Subjects: 2000

7. Study Procedures: The study will be conducted in two phases. In the first phase, teachers through the state of Louisiana will be asked to spend 45 minutes completing a questionnaire concerning their use of technology, the integration of technology within the classroom, and their experiences in their undergraduate program pertaining to electronic portfolios. In phase two, the teachers’ mentors and principals will complete a questionnaire pertaining to the teacher’s use of technology and the integration of technology within the classroom.

8. Benefits: Subjects will be entered into a drawing for a $250 gift certificate to the location of their choosing. Additionally, the study may yield valuable information that can help improve the state’s use of electronic portfolios in the education field.

9. Risks: The only study risk is the inadvertent release of sensitive information within the interview. However, every effort will be made to maintain confidentiality of the study records. The interviewees will be anonymous throughout the entire report and files will be kept in a secure location to which only the investigator has access.

10. Right to Refuse: Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

11. Privacy: Results of the study may be published, but no names or identify information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law. The interviewees will be anonymous throughout the entire published report.

12. Signatures: The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigator. If I have questions about subjects’ rights or other concerns, I can contact Robert C. Mathews, Chairman, Institutional Review Board, (225) 578-8692. I agree to participate in the study described above and acknowledge the investigator’s obligation to provide me with a signed copy of this consent form.

Signature of Subject __________________________________________________________

Date __________________________________________________________

Study Exempted By:

Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/irb
Exemption Expires: 3-3-2013
APPENDIX B
LETTER OF SOLICITATION FOR SUPERINTENDENTS

Dear ________________:

I am a doctoral candidate at Louisiana State University in Educational Leadership and Research. My dissertation research is a study of the effects of the use of electronic portfolios by PK-12 teachers. I have a good deal of experience in this area as I am a coordinator of electronic portfolio systems at Northwestern State University of Louisiana.

The design of my study involves having a sample of PK-12 teachers across Louisiana complete an online survey which focuses on their training and experiences related to electronic portfolios. I am writing you to ask your permission to contact a sample of teachers in your school system and request their participation in this study. The survey is online and it is not necessary that they complete it during school hours. The intent is that this study should in no way negatively impact instructional time. I am specifically requesting your permission to publish the online survey located at http://www.portfoliosurvey.com and make it available to teachers in your system. I would also like to contact the teachers through email to participate in the survey.

Enclosed is a description of the research being conducted along with the survey questions to be completed. Participation in the online survey is voluntary and each participant must complete an online consent form if they agree to participate in the survey. Ethical considerations are also outlined in the consent form. Every effort will be made to guarantee anonymity of all participants.

Should you have any questions, please contact me at 318-471-3615 (home) or 318-357-4004 (office) or my major advisor, Dr. Eugene Kennedy at 225-578-2193 at Louisiana State University. Your letter of approval will make my research possible. I look forward to receiving such approval from you.

Sincerely,

Jarrod

Jarrod Sanson
LSU Doctoral Student
Enclosure: Survey Questions, Consent Form
Dear Teacher:

I am a doctoral candidate at Louisiana State University in Educational Leadership and Research. My dissertation research is a study of the effects of the use of electronic portfolios by PK-12 teachers. I have a good deal of experience in this area as I am a coordinator of electronic portfolio systems at Northwestern State University of Louisiana.

I am writing you to request your participation in this study. The survey for the study is online and it is not necessary for you to complete the survey during school hours. The intent is that this study should in no way negatively impact your instructional time. The online survey is located at http://www.portfoliosurvey.com. The survey will take no more than 20 minutes to complete. Of the teachers that complete the survey, a drawing of five $50 gift certificates will be held.

Any help would be greatly appreciated.

Sincerely,

Jarrod

Jarrod Sanson
LSU Doctoral Student
APPENDIX D
LETTER OF SOLICITATION FOR MENTOR TEACHERS

Dear Teacher:

I am a doctoral candidate at Louisiana State University in Educational Leadership and Research. My dissertation research is a study of the effects of the use of electronic portfolios by PK-12 teachers. I have a good deal of experience in this area as I am a coordinator of electronic portfolio systems at Northwestern State University of Louisiana.

I am writing you to request your participation in this study. You will be completing an evaluation of a teacher that you evaluated in the LaTAAP program. The teacher to evaluate is listed below. The information will be completely confidential and the teacher will not be made aware of the evaluation.

The survey for the study is online and it is not necessary for you to complete the survey during school hours. The intent is that this study should in no way negatively impact your time. The online survey is located at http://www.foliosurvey.com. The survey will take no more than 20 minutes to complete. Of the principals that complete the survey, a drawing of two $50 gift certificates will be held.

The teacher in question is (teacher).

Any help would be greatly appreciated.

Sincerely,

Jarrod

Jarrod Sanson
LSU Doctoral Student
APPENDIX E
LETTER OF SOLICITATION TO PRINCIPALS

Dear Principal:

I am a doctoral candidate at Louisiana State University in Educational Leadership and Research. My dissertation research is a study of the effects of the use of electronic portfolios by PK-12 teachers. I have a good deal of experience in this area as I am a coordinator of electronic portfolio systems at Northwestern State University of Louisiana.

I am writing you to request your participation in this study. You will be completing an evaluation of a teacher that you evaluated in the LaTAAP program. The teacher to evaluate is listed below. The information will be completely confidential and the teacher will not be made aware of the evaluation.

The survey for the study is online and it is not necessary for you to complete the survey during school hours. The intent is that this study should in no way negatively impact your time. The online survey is located at http://www.foliosurvey.com. The survey will take no more than 20 minutes to complete. Of the principals that complete the survey, a drawing of two $50 gift certificates will be held.

The teacher in question is (teacher).

Any help would be greatly appreciated.

Sincerely,

Jarrod

Jarrod Sanson
LSU Doctoral Student
APPENDIX F
EFFECT OF ELECTRONIC PORTFOLIOS SURVEY-TEACHER

## Effects of Electronic Portfolio Survey

**Effect of Electronic Portfolios Survey**

Dear participant: Thanks for your input into this research. The purpose of this survey is to gain a better understanding of the effect of electronic portfolios in teacher education. This survey is untimed. When completing the survey, once you click the “Submit” button in each section, you will not be able to go back and change your answers. In accordance with the LSU institutional Review Board human subject policies, all responses will remain confidential and be used for research purposes only. You must be 18 years old or older, and your participation is voluntary. By completing the survey, you are providing your consent to participate in this study. If you have questions about participants' rights or other related concerns, you can contact Dr. Robert Matthews, Institution Review Board, LSU, at (225)675-8692. Thank you for participating in this survey. If you have any concerns or questions, please contact us: Jarrod Sanson, Ph. D. Candidate, Office of Electronic & Continuing Education, Northwestern State University, Natchitoches, LA 71497, Email: jsanso2@tigers.lsu.edu, Phone: 318-357-6565; or Dr. Eugene Kennedy, Associate Professor, Department of Educational Theory, Policy, & Practice, Louisiana State University, Baton Rouge, LA 70803-7101, Email: ekenney@lsu.edu, Phone: 225-578-2193.

### Demographic Information

1. **First Name:**
   
2. **Last Name:**
   
3. **Email Address:**

4. **Name of Parish Currently Teaching:**

5. **Name of School Currently Teaching:**

6. **Gender:**
   - Male
   - Female

7. **Age**
   - 20-29
   - 29-35
   - 31-35
   - 38-40
   - Other, please specify
School Background

*8. Number of years teaching, not counting this year:
   - Less than 1 year
   - 1 year
   - 2 years
   - 3 years
   - 4 years
   - 5 years or more

*9. Grade Level Teaching:
   - Pre-K
   - K
   - 1st
   - 2nd
   - 3rd
   - 4th
   - 5th
   - 6th
   - 7th
   - 8th
   - High School

*10. Describe your current school location:
   - Rural
   - Small town (Natchitoches, Leesville, Benton, Opelousas)
   - Mid-Size City (Pineville, Alexandria, Shreveport, Monroe, Lafayette)
   - Large City (Baton Rouge, New Orleans)
### Effects of Electronic Portfolio Survey

**11. Describe your school's student population:**
- 0-99 students
- 100-249 students
- 250-399 students
- 400-549 students
- 550-999 students
- 700-849 students
- 850-999 students
- 1000 and over students

### Collegiate Background

**12. College you graduated from:**
- Centenary College
- Grambling
- Louisiana College
- Louisiana State University
- Louisiana Tech
- LSU-Alexandria
- LSU-Shreveport
- McNeese State University
- Nicholls State University
- Northwestern State University
- Southeastern Louisiana University
- Southern University-Baton Rouge
- Southern University-New Orleans
- University of Louisiana-Lafayette
- University of Louisiana-Monroe
- University of New Orleans
- Out-of-State
Effects of Electronic Portfolio Survey

**13. Define the teacher education program completed:**
- Traditional 4-year education program (Bachelor’s)
- Alternative Certification Program (M.Ed.)
- Practitioner Teacher Program (M.A.T.)
- Other, please specify

Electronic Portfolio Background

**14. Did you create an electronic portfolio during your teaching education program?**
- Yes (Go to question 15.)
- No (Click Submit and go to next page.)

**15. If yes to question 14, which system did you use to create that electronic portfolio?**
- PASS-Port
- TaskStream
- LiveText
- Web editing software (SharePoint, FrontPage, etc.)
- Other, please specify

**16. If yes to question 14, what type of portfolio did you create?**
- Assessment (Demonstrate skill within a course; used to evaluate student competency)
- Developmental (Shows works in progress and development of skills)
- Showcase (Shows best work samples and can be used to gain employment)

LaTAAP Background

**17. Are you currently participating in the LaTAAP program?**
- Yes (Go to question 18.)
- No (Go to question 20.)
### Effects of Electronic Portfolio Survey

**18. Which year are you currently completing?**
- [ ] 1st Year
- [ ] 2nd Year

**19. Have you completed the evaluation portion of LaTAAP?**
- [ ] Yes (Go to question 21.)
- [ ] No (Go to question 23.)

**20. Have you completed the LaTAAP program?**
- [ ] Yes (Go to question 21.)
- [ ] No (Click Submit and go to question 25.)

**21. Did you successfully pass the evaluation portion of LaTAAP?**
- [ ] Yes
- [ ] No
### Effects of Electronic Portfolio Survey

**22. Please provide the following scores from LaTAAP:**

<table>
<thead>
<tr>
<th>Domain I: Planning</th>
<th>No points</th>
<th>1 point</th>
<th>2 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIA5: The teacher integrates technology into instruction.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>IIB1: Presents contents at a developmentally appropriate level.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>IIC1: Consistently monitors ongoing performance of students.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>IIC2: Uses appropriate and effective assessment techniques.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>IIC3: Provides timely feedback to students.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>IIC4: Produces evidence of student academic growth under his/her instruction.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domain IV: Professional Development</th>
<th>No points</th>
<th>1 point</th>
<th>2 points</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Domain V: School Improvement</th>
<th>No points</th>
<th>1 point</th>
<th>2 points</th>
</tr>
</thead>
</table>

**23. Who is/was your mentor teacher during the LaTAAP program?**

[ ]

**24. Who is/was the administrator (principal or school personnel) who assessed you during the LaTAAP program?**

[ ]

### Examination Background

**25. What was your score on the PRAXIS PLT exam?**

[ ]
**Effects of Electronic Portfolio Survey**

**26. What was your overall score on the ACT?**

**Basic instructions for the rest of survey:**

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. Among the digital tools we use are the following: computers, laptops, iPods, handhelds, interactive whiteboards, and software programs. Please answer all of the questions, and if you are uncertain of or neutral about your response, you may select neither “Neither Agree nor Disagree”.

**27. TK (Technology Knowledge)**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know how to solve my own technical problems.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can learn technology easily.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I keep up with important new technologies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I frequently play around the technology.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know about a lot of different technologies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have the technical skills I need to use technology.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have had sufficient opportunities to work with different technologies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**28. Please provide an example of your use of technology knowledge.**
### Effects of Electronic Portfolio Survey

#### 29. CK (Content Knowledge)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have sufficient knowledge about mathematics.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use a mathematical way of thinking.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have various ways and strategies of developing my understanding of mathematics.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have sufficient knowledge about social studies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use a historical way of thinking.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have various ways and strategies of developing my understanding of social studies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have sufficient knowledge about science.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use a scientific way of thinking.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have various ways and strategies of developing my understanding of science.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have sufficient knowledge about literacy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use a literary way of thinking.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have various ways and strategies of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Effects of Electronic Portfolio Survey**

developing my understanding of literacy.

*30. Please provide an example of your use of content knowledge.*


**31. PK (Pedagogical Knowledge)**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know how to assess student performance in a classroom.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can adapt my teaching based up on what students currently understand or do not understand.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can adapt my teaching style to different learners.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can assess student learning in multiple ways.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can use a wide range of teaching approaches in a classroom setting (collaborative learning, direct instruction, inquiry learning, problem/project based learning etc.)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am familiar with common student understandings and misconceptions.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know how to organize and maintain classroom management.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
### Effects of Electronic Portfolio Survey

**32. Please provide an example of your use of pedagogical knowledge.**

**33. PCK (Pedagogical Content Knowledge)**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know how to select effective teaching approaches to guide student thinking and learning in mathematics.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know how to select effective teaching approaches to guide student thinking and learning in literacy.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know how to select effective teaching approaches to guide student thinking and learning in science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know how to select effective teaching approaches to guide student thinking and learning in social studies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**34. Please provide an example of your use of pedagogical content knowledge.**
**Effects of Electronic Portfolio Survey**

### 35. TCK (Technological Content Knowledge)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know about technologies that I can use for understanding and doing mathematics.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know about technologies that I can use for understanding and doing literacy.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know about technologies that I can use for understanding and doing science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know about technologies that I can use for understanding and doing social studies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**36. Please provide an example of your use of technological content knowledge.**

[Blank space for text entry]
### Effects of Electronic Portfolio Survey

#### *37. TPK (Technological Pedagogical Knowledge)*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can choose technologies that enhance the teaching approaches for a lesson.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can choose technologies that enhance students' learning for a lesson.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am thinking critically about how to use technology in my classroom.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can adapt the use of the technologies that I am learning about to different teaching activities.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

#### *38. Please provide an example of your use of technological pedagogical knowledge.*

[Blank space for input]
<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can teach lessons that appropriately combine mathematics, technologies and teaching approaches.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I can teach lessons that appropriately combine literacy, technologies and teaching approaches.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I can teach lessons that appropriately combine social studies, technologies and teaching approaches.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I can teach lessons that appropriately combine science, technologies and teaching approaches.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I can provide leadership in helping others to coordinate the use of content.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Effects of Electronic Portfolio Survey

technologies and
teaching approaches
at my school and/or
district.
I can choose
technologies that
enhance the content
for a lesson.

*40. Please provide an example of your use of technology pedagogy and content knowledge.
### Effects of Electronic Portfolio Survey

#### *41. Models of TPACK (College Faculty & Teachers)*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My content professors appropriately modeled combining content, technologies and teaching approaches in their teaching.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My educational foundation professors appropriately modeled combining content, technologies and teaching approaches in their teaching.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My cooperating teacher appropriately modeled combining content, technologies and teaching approaches in their teaching.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My teaching colleagues appropriately model combining content, technologies and teaching approaches in their teaching.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Effects of Electronic Portfolio Survey

#### *42. Models of TPACK*

<table>
<thead>
<tr>
<th>In general, approximately what percentage of your teacher education professors have provided an effective model of combining content, technologies and teaching approaches in their teaching?</th>
<th>25% or less</th>
<th>26%-50%</th>
<th>51%-75%</th>
<th>76%-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In general, approximately what percentage of your professors outside of teacher education have provided an effective model of combining content, technologies and teaching approaches in their teaching?</th>
<th>25% or less</th>
<th>26%-50%</th>
<th>51%-75%</th>
<th>76%-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In general, approximately what percentage of teaching colleagues have provided an effective model of combining content, technologies and teaching approaches in their teaching?</th>
<th>25% or less</th>
<th>26%-50%</th>
<th>51%-75%</th>
<th>76%-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Effects of Electronic Portfolio Survey-Mentors and Principals

Dear participant: Thanks for your input into this research. The purpose of this survey is to gain a better understanding of the effect of electronic portfolios in teacher education. This survey is untimed. When completing the survey, once you click the "Submit" button in each section, you will not be able to go back and change your answers.

In accordance with the LSU institutional Review Board human subject policies, all responses will remain confidential and be used for research purposes only. You must be 18 years old or older, and your participation is voluntary. By completing the survey, you are providing your consent to participate in this study.

If you have questions about participants’ rights or other related concerns, you can contact Dr. Robert Matthews, Institution Review Board, LSU, at (225)678-8692.

Thank you for participating in this survey. If you have any concerns or questions, please contact us: Jarrod Sanson, Ph. D. Candidate, Office of Electronic & Continuing Education, Northwestern State University, Natchitoches, LA 71497, Email: jsanson2@tigers.lsu.edu, Phone: 318-357-6356; or Dr. Eugene Kennedy, Associate Professor, Department of Educational Theory, Policy, & Practice, Louisiana State University, Baton Rouge, LA 70803-7101, Email: ekenedy@lsu.edu, Phone: 225-578-2193

### Demographic Information

1. **First Name:**
2. **Last Name:**
3. **Email Address:**
4. **Name of Parish Currently Teaching or Working as Administrator:**
5. **Name of School Currently Teaching or Working as Administrator:**
6. **Name of Teacher You Are Evaluating:**

7. **Select the relationship you have or had with the teacher you are evaluating:**
   - Mentor Teacher
   - Administrator
   - Outside Evaluator
Effects of Electronic Portfolio Survey-Mentors and Principals

Basic instructions for the rest of survey:

For these questions, you are evaluating the person in question and not you.

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. Among the digital tools we use are the following: computers, laptops, iPods, handhelds, interactive whiteboards, and software programs. Please answer all of the questions, and if you are uncertain of or neutral about your response, you may select neither “Neither Agree nor Disagree”.

*8. TK (Technology Knowledge)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher knows how to solve own</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>technical problems.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The teacher can learn technology easily.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can keep up with important new technologies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher frequently plays around the technology.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows about a lot of different technologies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has the technical skills needed to use technology.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has had sufficient opportunities to work with different technologies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

9.

Please provide an example of the teacher’s technology knowledge.
### Effects of Electronic Portfolio Survey-Mentors and Principals

#### *10. CK (Content Knowledge)*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher has sufficient knowledge about mathematics.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can use a mathematical way of thinking.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has various ways and strategies of developing his/her understanding of mathematics.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has sufficient knowledge about social studies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can use a historical way of thinking.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has various ways and strategies of developing his/her understanding of social studies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has sufficient knowledge about science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can use a scientific way of thinking.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has various ways and strategies of developing his/her understanding of science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher has sufficient knowledge</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
### Effects of Electronic Portfolio Survey-Mentors and Principals

<table>
<thead>
<tr>
<th>The teacher can use a literary way of thinking.</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher has various ways and strategies of developing his/her understanding of literacy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**11. Please provide an example of the teacher's content knowledge.**

---

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### Effects of Electronic Portfolio Survey-Mentors and Principals

**12. PK (Pedagogical Knowledge)**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher knows how to assess student performance in a classroom.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can adapt his/her teaching based up what students currently understand or do not understand.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can adapt his/her teaching style to different learners.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can assess student learning in multiple ways.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can use a wide range of teaching approaches in a classroom setting (collaborative learning, direct instruction, inquiry learning, problem/project based learning etc.)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher is familiar with common student understandings and misconceptions.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows how to organize and maintain classroom management.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**13. Please provide an example of the teacher’s use of pedagogical knowledge.**
### Effects of Electronic Portfolio Survey-Mentors and Principals

**14. PCK (Pedagogical Content Knowledge)**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher knows how to select effective teaching approaches to guide student thinking and learning in mathematics.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows how to select effective teaching approaches to guide student thinking and learning in literacy.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows how to select effective teaching approaches to guide student thinking and learning in science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows how to select effective teaching approaches to guide student thinking and learning in social studies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**15. Please provide an example of the teacher’s use of pedagogical content knowledge.**
### Effects of Electronic Portfolio Survey—Mentors and Principals

**16. TCK (Technological Content Knowledge)**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher knows about technologies that he/she can use for understanding and doing mathematics.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows about technologies that he/she can use for understanding and doing literacy.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows about technologies that he/she can use for understanding and doing science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher knows about technologies that he/she can use for understanding and doing social studies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**17. Please provide an example of the teacher's use of technological content knowledge.**


### Effects of Electronic Portfolio Survey-Mentors and Principals

**18. TPK (Technological Pedagogical Knowledge)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher can choose technologies that enhance the teaching approaches for a lesson.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can choose technologies that enhance students' learning for a lesson.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can think critically about how to use technology in my classroom.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can adapt the use of the technologies that he/she is learning about to different teaching activities.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**19. Please provide an example of the teacher's use of technological pedagogical knowledge.**

---

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### Effects of Electronic Portfolio Survey—Mentors and Principals

#### *20. TPACK (Technology Pedagogy and Content Knowledge)*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher can teach lessons that appropriately combine mathematics, technologies and teaching approaches.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can teach lessons that appropriately combine literacy, technologies and teaching approaches.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can teach lessons that appropriately combine social studies, technologies and teaching approaches.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can teach lessons that appropriately combine science, technologies and teaching approaches.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can select technologies to use in his/her classroom that enhance what he/she teaches, how he/she teaches and what students learn.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can use strategies that combine content, technologies and teaching approaches that he/she has learned about in</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
### Effects of Electronic Portfolio Survey-Mentors and Principals

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at his/her school and/or district.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The teacher can choose technologies that enhance the content for a lesson.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**21. Please provide an example of the teacher’s use of technology pedagogy and content knowledge.**


### Reflective Processing

This section of the survey focuses on the ability to reflect on teaching. Please answer all of the questions and if you are uncertain of or neutral about your response you may always select “Neither Agree or Disagree”.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the teacher reflects on his/her teaching, he/she uses “I believe”, “I feel” in his/her thoughts of his/her teaching.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>When the teacher reflects on his/her teaching, he/she explains the factors that contributed to the success/failure of the teaching.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>When the teacher reflects on his/her teaching, he/she explains the moral and ethical impact of his/her teaching.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
VITA

Jarrod L. Sanson completed a bachelor of science degree in business education from Northwestern State University (NSU) in 1996. After completing his degree, he began his teaching career with the Rapides Parish School Board System. After a few years of teaching, Jarrod began working on a master of education degree in educational technology (2005) and worked as a graduate assistant during the summers he was not teaching in the parish. In 2004, Jarrod was hired in the position of PASS-Port Coordinator and Trainer, now Electronic Portfolio Coordinator and Trainer, for NSU.

During Jarrod’s tenure at NSU, he has been a participant of two NCATE accreditations, providing data for use through the accreditations and a participant of a SACS accreditation as member of the SACS Documents and Editing Committee. In 2010, he began teaching ETEC 4820: Evaluation and Use of Technology in Education and then in 2011, began teaching ETEC 4810: Introduction to Computers in Education.

Jarrod has also been a presenter and writer. He has been part of presentations at the Louisiana Community and Technical College System Conference, the Louisiana Moodle Moot Conference, and the Society for Information Technology and Teacher Education Conference. He was also a co-author of a chapter in the book, *Wired for Learning: An Educator’s Guide to Web 2.0*. 