5-2013

Technology Implementation: Teacher Age, Experience, Self-Efficacy, and Professional Development as Related to Classroom Technology Integration

Stephanie Renee Tweed
East Tennessee State University

Technology Implementation: Teacher Age, Experience, Self-Efficacy, and Professional Development as Related to Classroom Technology Integration

---

A dissertation

presented to

the faculty of the Department of Educational Leadership and Policy Analysis

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Doctor of Education in Educational Leadership

---

by

Stephanie Tweed

May 2013

Dr. Virginia Foley, Chair

Dr. Bethany Flora

Dr. Don Good

Dr. Aimee Govett

Key Words: Classroom Technology Implementation, Self-Efficacy, Professional Development

ABSTRACT

Technology Implementation: Teacher Age, Experience, Self-Efficacy, and Professional Development as Related to Classroom Technology Integration

by

Stephanie Tweed

The purpose of this quantitative study was to identify the combination of factors that pertain to the implementation of new technologies in the classroom. Specifically, the study was an analysis of the age of the teacher, years of teaching experience, quality of professional development, and teacher self-efficacy as defined by Bandura (1997) to examine the manner in which these factors relate to implementing new technologies in the classroom. Participants in this study were located in 2 different school districts in East Tennessee. All data were collected through an online survey distributed to K-5 teachers by way of email from school principals. The analysis of data was based on the responses of 124 teachers from these 2 school districts. Research revealed that teacher age, years of teaching experience, teacher gender, and the hours a teacher spent in technology professional development did not play a significant role in the self-efficacy by teachers. Findings also indicated that teacher age, years of teaching experience, teacher gender, and the hours spent in technology professional development did not play a significant role in the classroom technology use by teachers. However, the research indicated that the self-efficacy of teachers is significantly positively related to classroom technology use by teachers.

DEDICATION

I dedicate this work to my family, who has stuck by me through life's adventures and overwhelming odds. While hard work and dedication have made this opportunity possible, the love and support I have received from those who spend each day with me has helped make my dream come true.

First, I would like to recognize my mother Jackie Cutshaw. Never in my life have I seen a mother who has more faith in her child than my mother has in me. While I know that it was a struggle to raise me as a single mom, I also know that the confidence she had in me has given me the confidence that I now find in myself. While she will always be convinced that I am the smartest person in the world, I will always know that I am who I am because of the way she raised me.

Second, I would like to recognize my grandmother and grandfather, Clyde and JoAnn Cutshaw. These two people have been my rock and it has been a pleasure to share my life with both of them. They have been witness to the failures I have had in life as well as to my successes. Through it all, they never gave up on me or lost faith. I have watched them both live their lives through me for as long as I can remember. My grandmother and grandfather held my hand through a divorce, carried me when I was too sick to walk, nursed me back to health after extensive colon surgery, and cried with me when I found happiness with my husband and my babies. No matter what life has thrown my way, they have both been right by my side.

Third, I would like to recognize my aunt and uncle, Mary and John Ottinger. My aunt has served as a second mom to me my entire life. Although she has a daughter of her own, most people who know her would tell you that she has two. The struggles she has faced and overcome

in her life have served as an inspiration to me throughout all of mine. When times got tough as I got sicker and sicker, my aunt never left my side. Today, I see the joy in her eyes when she sees just how far I have come since that time in my life. My uncle John has shown me what it is to love someone with all of your heart and take care of that person always. Never once has he complained that I take up so much of their love, and attention and he is always there for a hug when I need it the most.

Fourth, I would like to recognize my husband Shaun Tweed. Shaun has taught me the value of having a life partner. The faith and devotion that he has for me has shown me what it is like to go through life with a soul mate. He is the one I lean on, my rock, and my calming force. Never before have I seen a man who was so proud of his wife and her accomplishments. He looks at each new accomplishment as if it were his own. The love that he shows to our babies is like none other in the world. When I felt unsure as to where I was going with my life and career, Shaun urged me to follow my dreams. He has worked hard each and every day to make sure that they are coming true.

Finally, I would like to thank my two children Andrew and Sophie. My children have helped me realize that there is so much more to life than what people initially see. Watching them grow up to be their own little persons each day and knowing that I am molding them to be something far greater is so gratifying. These two are my reason for continuing on at crucial times. Since I laid eyes on them, I have wanted them to be proud of me. I know that they both love me unconditionally and are not capable of even seeing my faults. I only hope I can help to make their dreams come true one day.

ACKNOWLEDGEMENTS

I would like to express my gratitude to those who have supported me and encouraged me on a daily basis to continue to pursue my dreams. A special word of thanks goes out to my committee chair Dr. Virginia Foley. The support and guidance you have shown to me throughout the dissertation process has been tremendous. The encouraging words you always have for me and the guidance you provide helped make this possible. I have never met anyone who so obviously wants her students to succeed as if they are her own children.

I would also like to thank my committee members: Dr. Don Good, Dr. Bethany Flora, and Dr. Aimee Govett. All of you have been just as committed to seeing me finish as I have been. There has never been a time when I have reached out to any of you when you were not willing to drop everything and talk with me. Dr. Good, you are by far the only person who could have helped me grasp the concept of statistics and quantitative research. You have made me appreciate these things. I also appreciate how patient you have been with me in your teachings. Dr. Flora, you have made me a better writer on a professional level. You have taught me how to construct a professional paper and write in a research tone. I will take these skills with me always. Dr. Govett, you have been willing to serve as my outside committee member without even really knowing me. You simply read about my interest, met me, and were willing to take me on as your student. I sincerely appreciate your faith in me and trust.

Finally, I would like to thank the ELPA faculty and fellows. The faculty here at ELPA has been the warmest I have ever known. Their support of me both as a student and a fellow has been overwhelming. They are always available with a kind word and a smile. The fellows have

become more like friends than colleagues. When I needed encouragement and someone to be on my side, you all have been there. I only hope I have done the same for you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Page

Figure

CHAPTER 1

INTRODUCTION

The United States has been on a quest for educational reform for more than half a century. Perhaps the most radical shift in reform first came with the launching of the Soviet satellite, *Sputnik*, in 1957. Prior to the launching, the United States stood at the forefront of medical research, automobile design and manufacturing, and electronics. *Sputnik* changed that and made the United States seem like a nation that had fallen behind (Wissehr, Concannon, & Barrow 2011). President Eisenhower responded by passing the National Defense Education Act (NDEA) in 1958, placing an emphasis on math, science, and foreign language education. Congress passed the Elementary and Secondary Education Act of 1965 as part of President Lyndon B. Johnson's "Great Society Movement." This provided Title I-IV funds and ended the taboo of the government providing funding to schools. For the first time in history the federal government made a massive foray into education and emphasized the needs of children who are disadvantaged (Sanders, 2010).

The second radical shift in educational reform in the United States came shortly after with the publishing of *A Nation at* Risk in 1983. Often referred to as the "paper *Sputnik,"* this report placed more attention on education than the original *Sputnik* (Bracey, 2011). *A Nation at Risk* suggested that high performance in K-12 education as measured by testing was responsible for a nation's economic growth. The United States was reported to have fallen behind once again.

The Clinton Administration's response to the perceived educational issues in the United States was a reauthorization of the Elementary and Secondary Education Act (ESEA), now

referred to as Improving Americas Schools Act of 1994. This piece of legislature was designed to promote drug-free schools and immigrant education. The ESEA was reauthorized once again during the Bush Administration under the now famous name, No Child Left Behind Act of 2001. This Act placed a large focus on accountability of both the teacher and student, adequate yearly progress of schools, and the achievement gap. Currently, the No Child Left Behind Act is arguably the most far reaching education policy initiative in the United States over the last 4 decades (Dee & Jacob, 2010).

Today the United States is involved in the Race to the Top (R2T) challenge created to spur innovation and reform in our K-12 schools. Federal funds provided by the American Recovery and Reinvestment Act of 2009 are awarded to schools meeting established criteria for excellence (U.S. Department of Education). In addition to a federal push towards excellence via Race to the Top, states have likewise responded with the Common Core Standards Initiative. This initiative is an effort to establish consensus on expectations for student knowledge and skills that should be developed in grades K-12 (Porter, McMaken, Hwang, & Yang, 2012). The new standards are designed to be robust and reflect the knowledge that students need to compete in college and careers in a global economy. The Common Core Standards include basic technology skills such as keyboarding but also call for students to use technology to help them learn rather than just having it available to them (Roscorla, 2010). As a part of this initiative superintendents all across the United States are working to integrate technology into their classrooms that will help students master these new standards.

Despite increases in computer access and technology training, technology is not being used to support the kinds of instruction believed to be the most powerful (Ertmer & Ottenbreit-Leftwich, 2010). Current research suggests that we have not yet achieved high levels of effective

technology use either in the United States or internationally (Mueller, Wood, Willoughby, Ross, & Specht, 2008). Furthermore, teachers are often reluctant to use technology. In fact, teacher reluctance to technology use is cited as the main barrier to successful technology integration in schools (Durrant & Green, 2000).

Statement of the Problem

There exists a vast array of research studies that analyze the integration of technology into classrooms (Hernandez-Ramoz, 2005; Lawless & Pellegrino, 2007; Levin & Wadmany, 2008). These studies look at a variety of factors that influence this implementation, including teacher age (Inan & Lowther, 2010), self-efficacy (Skaalvik & Skaalvik, 2010), professional development on technology (Wright, 2010), and years of teaching experience (Smarkola, 2007). However, there is lack of research that combines all these factors into one study to see how they compare and correlate with one another. Demands for technology integration as a part of educational reform are on the rise. It is no longer appropriate to suggest that teachers' low-level and inappropriate uses of technology are adequate enough to meet the needs of the 21st century learner (Ertmer & Ottenbreit-Leftwich, 2010). Therefore, the purpose of this study was to identify the combination of factors that pertain to the implementation of new technologies in the classroom. Specifically, the study was an analysis of the age of the teacher, years of teaching experience, quality of professional development, and teacher self-efficacy as defined by Bandura (1997) to examine the manner in which these factors relate to implementing new technologies in the classroom.

Research Questions

1. Is there a significant correlation between teacher age and teacher self-efficacy scores?
2. Is there a significant correlation between years of teaching experience and teacher self-efficacy scores?
3. Is there a significant correlation between the hours spent in technology professional development and teacher self-efficacy scores?
4. Is there a significant correlation between teacher age and technology use in the classroom?
5. Is there a significant correlation between years of teaching experience and technology use in the classroom?
6. Is there a significant correlation between the hours spent in technology professional development and technology use in the classroom?
7. Is there a significant correlation between teacher self-efficacy scores and technology use in the classroom?
8. Is there a significant difference between the teacher self-efficacy scores of males and females?
9. Is there a significant difference between the classroom technology use of females and males.

Significance of Study

More research is needed to determine if certain factors relate to the integration of technology into classrooms. This study is an analysis of a combination of factors regarding

technology integration, including teacher age, teacher self-efficacy, years of teaching experience, and the quality of professional development teachers are receiving on using the technology.

This study has the potential to provide insight to school leaders on successful technology integration. Analyzing the data from this study could help school leaders identify areas of weakness in professional development and trends among faculty members that lack successful integration of technology in their classrooms. There is a lack of research that combines the factors of self-efficacy, age, teaching experience, and professional development and their impact on the integration of technology into classrooms. This study could provide useful information for school leaders on how these factors impact technology integration in the classroom.

Definition of Terms

To ensure the meaning and understanding of the terms used in this study, the following definitions are provided.

1. *Professional Development*: A comprehensive, sustained, and intensive approach to improving teachers' and principals' effectiveness in raising student achievement (Leaning Forward, 2010).
2. *Self-Efficacy*: The belief in one's ability to organize and execute actions required to manage prospective situations (Bandura, 1997).
3. *Teacher Self-Efficacy*: A teacher's judgment of his or her capability to bring about desired outcomes of student engagement and learning (Tschannen-Moran & Woolfolk-Hoy, 2001).

4. *Race to the Top (R2T)*: United States Department of Education program that is designed to spur reform in state and local district K-12 education (US Department of Education, 2009).
5. *No Child Left Behind (NCLB):* Reauthorization of Elementary and Secondary Education Act of 1965 that was signed into law by President George W. Bush in 2002 in an effort to improve student achievement (US Department of Education, 2003).
6. *Common Core Standards:* An effort to establish consensus on expectations for student knowledge and skills that should be developed in grades K-12 (Porter et al., 2011).

Limitations and Delimitations

Certain limitations existed regarding this study due to the nature of the population that was chosen. The population was delimited to all K-5 teachers in two school districts in East Tennessee during the 2012-2013 school year. Therefore the results of this study may not be generalized to reflect the characteristics of any other educational system. All teachers in grades K-5 were invited to participate in the survey. However, the responses of those who chose to participate may be different than those who chose not to participate.

Overview of the Study

This study is organized into five chapters. Chapter 1 contains an introduction to the study, context and history of the issue, statement of the problem, significance of the study, definition of terms, and limitations and delimitations. Chapter 2 includes a review of literature that is organized according to topic. Chapter 3 includes the research methodology, research questions,

research design, and population of the study. Chapter 4 provides results of the study, while Chapter 5 includes a summary of the findings, conclusions, and recommendations for future research and practice.

CHAPTER 2

LITERATURE REVEW

Introduction

This study was designed to identify the combination of factors that pertain to the implementation of new technologies in the classroom. Specifically the study is an analysis of the age of the teacher, years of teaching experience, quality of professional development, and teacher self-efficacy to examine the manner in which these factors relate to implementing new technologies in the classroom.

In order to understand this study in the proper context a review of literature was completed. This review of literature was arranged by theme beginning with the concept of self-efficacy.

Self-Efficacy

Self-efficacy, grounded in the theoretical framework of Bandura's social cognitive theory, is defined as "people's judgments of their capability to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Since its introduction, the construct of self-efficacy has been identified as a significant variable for predicting an individual's behavior (Bandura, 1977). Expectations of self-efficacy determine whether instrumental actions will be initiated, how much effort will be put into the action, and how long the action will be sustained in the face of challenges and failures. Once an action is taken, highly self-efficacious people invest more effort and persist longer than those with low self-efficacy. When setbacks occur they recover quickly and stay committed to their goals (Schwarzer & Hallum, 2008). Self-efficacy affects one's goals and behaviors and is influenced

by one's actions and conditions in the environment (Schunk & Meece, 2006). "People's beliefs in their efficacy affect almost everything they do: how they think, motivate themselves, and behave" (Bandura, 1977, p. 53). Through the formation of human behavior, self-efficacy has a great impact on people's motivation and personal accomplishments (Gorozidis & Papaioannou, 2011). A low sense of self-efficacy is associated with depression, anxiety, and helplessness. Persons with low self-efficacy also have low self-esteem and harbor pessimistic thoughts regarding their ability to accomplish goals. Thus, self-efficacy levels can enhance or impede motivation (Schwarzer & Hallum, 2008). Self-efficacy is considered to be an important variable as it has been found to predict performance independently of past performance (Bandura, 1997). "It is important to note that self-efficacy is a motivational construct based on self-perception of competence rather than actual level of competence" (Tschannen-Moran & Hoy, 2007, p. 946). Self-efficacy has often been used as an independent variable in research and correlated with best practices by teachers and student learning (Eberle, 2011).

When considering performance on a specific task, self-efficacy can have a strong influence on decisions. A task is usually chosen according to the degree of self-efficacy possessed (Rogers, 1995). When low self-efficacy exists, related tasks are avoided (Bandura, 1995). High levels of self-efficacy toward a task usually equal greater personal achievement, persistence, enthusiasm, and increased efforts (Bandura, 1995; Karsten & Roth, 1998). Bandura (1995) suggested that individuals who perceive a task or innovation as difficult will be slow to embrace the new technology. This suggests that the self-efficacy of a teacher could have a large impact on how successful he or she is at implementing a new classroom technology.

Sources of Self-Efficacy

The most potent source of self-efficacy typically comes from mastery experiences, or one's interpretation of one's own performance (Bandura, 1986, 1997). Mastery experiences are at the heart of self-efficacy beliefs (Pajares, 2002). After completing a task, one will interpret and evaluate the results obtained and judgments of competence are created or revised according to these results (Usher & Pajares, 2008). Actions that are perceived as successful tend to raise self-efficacy, whereas actions that are perceived as failures tend to lower it. Experiencing mastery in a domain often has enduring effects on one's self-efficacy (Usher & Pajares, 2008). Mastery experiences have proven to be especially powerful when individuals overcome obstacles or succeed in tasks that are challenging (Bandura, 1997).

Vicarious experiences are the second most powerful source of self-efficacy and help individuals obtain information about what they can do. These experiences include the careful observation of the actions of others such as classmates, peers, and adults (Bandura, 1997). When one classmate is able to pass an exam with success, there exists a possibility that the self-efficacy of other classmates will rise as it relates to their ability to achieve success at a similar task. A vicarious model, such as the one described, is typically an individual with whom the observer has a close relationship and whose personal characteristics and shared experiences are considered to be elevated in status (Bandura, 1995). The failure of a vicarious model can have a devastating effect on the self-efficacy of the observer. Students tend to seek out models who are competent at tasks to which they aspire, particularly a model with power, status, and prestige (Bandura, 1997). Social models such as these play a powerful role in the development of self-efficacy when students are not confident in their abilities or have a limited amount of experience with the task at hand (Usher & Pajares, 2008).

Social persuasions are a third source of self-efficacy in which evaluative feedback from teachers, parents, and peers may alter a student's confidence level (Bandura, 1997).When students are not yet skilled at making accurate appraisals of themselves, they often depend on the evaluative feedback of others (Usher & Pajares, 2008). Positive feedback from teachers may result in students who have higher self-efficacy. Those who receive praise and gain the confidence of others often progress to mastery experiences. However, it may actually be easier to undermine a person's self-efficacy through verbal and social persuasions than to enhance it. This is even truer during the formative years of childhood when youngsters carefully attend to the messages they get from those close to them (Bandura, 1997).

The last source of self-efficacy comes from the physiological and emotional state of the individual. This includes stress, anxiety, fatigue, and mood as an indicator of capability (Bandura, 1997). A student who has a high level of anxiety before and during an assessment may also have decreased levels of self-efficacy on the content of that assessment. Stress and anxiety play vital roles in the development of self-efficacy beliefs because they translate to a lack of control, taxing situations, and general threats to task achievement. Students learn to interpret their physiological arousal as an indicator of personal competence by evaluating their own performances when placed in varying situations. As a general rule increasing students' physical and emotional well-being and reducing negative emotional states will strengthen self-efficacy. Self-efficacy beliefs that students hold when they approach a new task serves as a filter through which new information is processed. Students who lack confidence in their ability to accomplish a task may interpret their anxiety as a sign of incompetence, while students who hold firm beliefs in their abilities remain untouched by fluctuations in physiological arousal (Pajares & Usher, 2008).

Teacher Self-Efficacy

In the educational sphere teacher self-efficacy can be conceptualized as an individual teacher's beliefs in his or her own ability to plan, organize, and carry out activities that are required to attain educational goals (Skaalvik & Skaalvik, 2009). Researchers have often defined teacher self-efficacy as the belief teachers have in their ability to teach that resulted in improved student learning (Tschannen-Moran & Hoy, 2002; Tschannen-Moran, Hoy, & Hoy, 1998; Woolfolk, Rosoff, & Hoy, 1990). Early efforts to measure a teacher's sense of efficacy evolved from Rotter's (1966) theory regarding lotus of control and analyzed how extensively teachers felt they could control student outcomes regardless of environmental factors, though Bandura is often given credit for the concept of teacher self-efficacy. Bandura (1997) claimed:

> Teachers' perceived efficacy rests on much more than the ability to transmit subject matter. Their effectiveness is also partly determined by their efficacy in maintaining an orderly classroom conducive to learning, enlisting resources and parental involvement in children's academic activities, and counteracting social influences that subvert students' commitments to academic pursuits. (p. 243)

In the early days of teacher efficacy research the RAND Corporation pinpointed teacher efficacy as the most important variable in change implementation (Berman & McLaughlin, 1977). It was concluded in the RAND study that teachers who believed they could positively impact student achievement were more effective at implementing change (Cantrell & Calloway, 2007). Further research on teacher self-efficacy revealed that the concept of efficacy is domain and context specific. Teachers might feel highly efficacious with one content area of the job while they have low efficacy in another content area (Tschannen-Moran et al., 1998).

Research leaves little doubt that high levels of teacher self-efficacy benefit classrooms and students. Teacher self-efficacy has been shown to affect teacher strategies (Allinder, 1994; Woolfolk et al., 1990), teacher's goals and aspirations (Muijs & Reynolds, 2002), and teachers'

attitudes toward innovation and change (Fuchs, Fuchs, & Bishop, 1992). Teacher self-efficacy has also been linked to effective classroom practices and higher student achievement (Ashton & Webb, 1992; Gibson & Dembo, 1984; Ross, 1992). Allinder (1994) found that highly efficacious teachers tend to be more organized, try to find better ways of teaching, are willing to experiment and use new instructional materials, use innovative methods, and show more enthusiasm for teaching. The highly efficacious teacher is more prepared to experiment and implement educational innovations (Evers, Brouwers, & Tomic, 2002). Teachers with high levels of self-efficacy show higher levels of job satisfaction, while teachers with low self-efficacy are more likely to experience burnout (Skaalvik & Skaalvik, 2009). Teachers with low levels of self-efficacy believe that little can be done to reach those students who are unmotivated and that they are limited as a teacher to environmental factors that cannot be controlled. Teachers with high levels of efficacy are more inclined to create classrooms that focus on student-learning and have a dynamic environment (Swan, Cano, & Wolf, 2011). Siebert (2006) concluded that teacher self-efficacy was of vital importance because teachers with low levels of efficacy were found to be cynical of their own abilities, as well as the abilities of their students and colleagues. Teachers with low self-efficacy also tend to undermine students' cognitive development and students' judgments of their own capabilities.

Classroom Technology Integration in the 21st Century

Schools, districts, and the federal government have heavily invested in instructional technology since the early 1990s (Miranda & Russell, 2011). Teacher technology preparedness has been emphasized in policies and reports as the "single most important step" towards integrating technology into education (Groth, Dunlap, & Kidd, 2007). Besides hardware, teacher

technology professional development remains the most common top priority for educational technology spending in most states (Education Week, 2005). The United States Department of Education (2003) stated that "technology is now considered by most educators and parents to be an integral part of providing a high-quality education" (p. 3). In fact, the U.S. Department of Education's Preparing Tomorrow's Teachers to Use Technology (PT3) program has spent $275 million and awarded 441 grants since 1999 (U.S. Department of Education). Other organizations have called for students to learn and develop 21st century skills. These skills include using digital tools to problem solve, communicate, collaborate, create, and research (NETS for Students, 2007). Educators agree that "student teachers should be prepared to integrate information and communication technology into their future teaching and learning practices" (Sang, Valcke, van Braak, & Tondeur, 2010, p. 103). No Child Left Behind and the Common Core Standards Initiative place a strong emphasis on recruiting and retaining high-quality teachers who possess both content and pedagogical knowledge, are able to differentiate instruction, and make data-based decisions. All of these are efforts that benefit immensely from the use of new technology tools (Means, Padilla, Debarger, & Bakia, 2009). Clifford, Friesen, and Lock (2004) declared that:

> Preparing teachers for the 21st century requires a close look at what it means to teach and learn in increasingly networked, technology-rich, digital classrooms. Teacher preparation programs need to create intentional learning environments, where pre-service teachers can explore issues that are relevant and develop pedagogies that are effective for a knowledge era. They need to develop new images and expertise to design and facilitate meaningful learning with technology. (p.19)

Recent international reports paint a promising picture of efforts made by classroom teachers to use technology to support student learning (Voogt, 2008). The cost of technology has become increasingly inexpensive, making technology more universally accessible (Klein, 2010).

"Nearly 100% of public schools in the United States have internet access, with 97% reporting having a broadband connection" (Tripp & Herr-Stephenson, 2009, p.1190). A recent *Teachers Talk* Tech survey, containing the responses of over 1,000 teachers, showed that 79% of teachers use computers to teach students (CDW-G). The National Education Association (2008) reports also seeing increases in the instructional uses of computers in the classroom. Strauss (2005) found that educators have begun to incorporate interactive multimedia presentations, blogs, wikis, social media, and video games into the classroom as well. Perhaps the most comprehensive report regarding educational technology in schools came from the National Center for Education Statistics (2008). This report, *Educational Technology in U.S. Public Schools*, bragged that out of the 100% of public schools that had internet access, 91% of the computers in public schools were used for instructional purposes. Schools participating in the report stated that 87% of the computers available were used to provide standardized assessment results, 85% were used for data to inform instructional planning at the school, 72% were used for online student assessment, and 65% were used for high-quality online digital content (National Center for Education Statistics, 2008).

A closer look at the data provides a somewhat conflicting report. While there is no doubt that teachers have increased their technology use (Project Tomorrow, 2008), high-level, effective technology use in classrooms is lacking (Mueller et al., 2008). Teachers are not using technology to support student-centered instruction as required by today's learners (International Society for Technology in Education, 2008). Teachers most frequently use technology to support, rather than alter, their existing practices (Peck, Cuban, & Kirkpatrick, 2002). Even among teachers who claim their classrooms are student-centered, technology uses are described as not being powerful or innovative (Hermans, Tondeur, van Braak, & Valcke, 2008). Achieving the kinds of

technology uses required for 21st century teaching and learning requires teachers to know how to use the technology to facilitate meaningful learning (Lai, 2008). For schools to integrate technology for higher-order uses, leaders must understand how to help teachers learn to integrate technology and assess their progress at doing so (McConnell, 2011). Currently a disconnect exists between the way that youth use technology in their personal lives and how technology is being used in schools. "Technology tends to be marginalized and used in instrumental ways within the conventional educational framework" (Clifford et al., p. 24). Research indicates that teachers need training and experiences to develop the computer knowledge required to use technology for student learning (Inan & Lowther, 2010).

Teacher Self-Efficacy and Technology Implementation

The personalities, self-efficacy, beliefs, and attitudes of teachers are important factors to consider when investigating the integration and adoption of current technologies in the educational realm (Paraskeva, Bouta, & Papagianni, 2008). An overarching problem lies in the failure of educators to embrace and adopt technologies into their pedagogical systems, which represents an impediment for student success (Park & Ertmer, 2008). Self-efficacy has been identified as an important barrier that must be overcome for teachers to integrate technology effectively (Ertmer & Ottenbreit-Leftwich, 2010). If researchers and practitioners do not have a clear understanding of the relationship between teacher self-efficacy and technology integration in classrooms, they may continue to advocate for specific uses of technology that they are not able to support due to underlying fundamental beliefs of the teacher (Ertmer, 2005, p. 35). Evidence suggests that self-efficacy may be more important than skills and knowledge among teachers who implement technology in their classrooms (Ertmer & Ottenbreit-Leftwich, 2010).

Research indicates a link between computer self-efficacy of the teacher, the comfort level of the teacher regarding technology, and classroom technology integration. Koh and Frick (2009) found a positive relationship between a teacher's computer self-efficacy and technology integration in the classroom. McCormick and Ayers (2009) revealed that the stronger the teachers' beliefs were in their capabilities to teach in new ways, the stronger their beliefs were in their capability to use technology to do so. Like studies indicated that the more comfortable teachers are with using computers for classroom use, the more they will progress in the stages of implementing technology for higher level uses (McAdoo, 2005). If teachers are properly taught to use technology before they enter a classroom, their self-efficacy will increase, along with the likeliness that they will use technology in the classroom. Teachers who have more access to technology and have more experience with it appear to be more comfortable with technology and use it more frequently in their classrooms than teachers who have less access and less experience (Miranda, 2007). Teacher computer self-efficacy might determine the ability of the teacher to develop technologies as important educational tools (Paraskev et al., 2007). Paraskeva et al. (2007) make the claim that:

> A strong sense of computer self-efficacy of school teachers can affect the extent as well as the way technology can be used in everyday instructional practice, significantly changing both the teacher's and the student's roles. Studies suggest that technology has the potential to revise and change teachers' roles. Technology can foster a shift in the teacher's role from a traditional one to that of a facilitator in the classroom. (p. 1085)

The overall theme in research regarding teacher self-efficacy and technology integration is that teachers who have high levels of self-efficacy are more willing to try new things and experiment more with educational innovations in the classroom (Evers et al., 2002). Computer self-efficacy is of the upmost importance because it has been directly linked with classroom technology integration (Koh & Frick, 2009). Teachers who experiment with new technologies

become more comfortable with them and use these technologies more frequently, building self-confidence and self-efficacy (Mueller et al., 2005).

Self-Efficacy and Age

A vast array of conflicting research exists on the effect that age has on self-efficacy. Bandura (1995) suggested that age does not correlate with efficacy because people vary greatly in how efficaciously they manage their lives. These findings have been echoed in more recent research that concluded there is no significant relationship between age and levels of self-efficacy (Hicks, 2012; Jenks, 2004; Hoy & Tschannen-Moran, 2007; Voris, 2011). Jenks (2004) conducted a comprehensive study on the effects that age, sex, and language proficiency have on self-efficacy levels. Findings from his study revealed that age showed no statistically significant relationship with levels of self-efficacy as evaluated by a chi-square analysis. Specifically regarding the area of teacher age and self-efficacy levels, Hicks (2012) analyzed how classroom management, teacher age, and self-efficacy levels were related. Findings from this study reflected that no sufficient evidence was provided to indicate a relationship between self-efficacy and teacher age. Hoy and Tschannen-Moran (2007) concluded that there was not a significant difference in the potential sources of self-efficacy beliefs of teachers in regard to their age. Finally, Voris (2011) analyzed the role that teacher efficacy, job satisfaction, age, and other demographic variables play in the self-efficacy of early career special education teachers. Findings suggest there are no significant differences in the self-efficacy levels of special education teachers when analyzed by age.

Conflicting research exists to suggest that age does affect the level of self-efficacy a teacher experiences. Ghanizadeh and Moafian (2009) discovered that the older the teachers, the

higher their beliefs regarding self-efficacy in a study regarding the relationship between Iranian teachers' self-efficacy scores and pedagogical success. Other research indicates teachers who are younger in age are associated with stronger beliefs of self-efficacy and higher expectations (Edwards & Robinson, 2012; Smits & Bosscher, 1998).

Bandura (1994) acknowledged that age does not play a role in self-efficacy, yet his research does indicate that there are changes in self-efficacy over the lifespan of an individual according to which period of life they are in and how they handle situations that arise during these periods. For example, newborns come without a sense of efficacy and only gain efficacy by observing that environmental events occur with action and not without it. This helps infants to learn that actions produce effects. As infants mature, those around them treat them as distinct people. Based on growing personal and social experiences, infants eventually form a sense of self. As infants become young children, they gain self-knowledge of their capabilities in different aspects of functioning. The early exploratory activities and play provide opportunities for them to enlarge their basic skills and sense of efficacy. Successful experiences are central to the early development of social and cognitive competence as well as self-efficacy. The initial efficacy experiences are centered in the family, but as children grow peers become increasingly important in the development of self-efficacy. How successful children are at making friends and interacting socially will impact self-efficacy either positively or negatively. When children enter school and begin to master cognitive skills, they continue to develop a growing sense of their intellectual efficacy. Adolescence presents a new life period and new challenges as teens master new skills and the ways of adults by learning to deal with pubertal changes, emotional partnerships, and sexuality. Adolescents expand and strengthen their sense of efficacy by learning how to deal successfully with troublesome matters that are new to them. The transition

from teens to young adults provides a new set of challenges to self-efficacy. Young adulthood is a period when people learn to cope with lasting partnerships, marriages, parenthood, and careers. People's perceived self-efficacy up to this point determines how well they develop self-management and interpersonal skills required for an occupation. The transition to parenthood during this life period requires that young adults deal with the challenges of raising children and managing interdependent relationships within the family and social systems. The middle years bring a life period where people settle into established routines and stabilize their self-efficacy beliefs. However, this stability may be shaky because life does not remain static (Bandura, 1994). As people enter into advanced age, their self-efficacy may see a decline as they notice a decrease in things like memory performance. The advanced life period brings about major life changes like retirement, relocation, and even the loss of friends or spouses. The ability to deal with these issues and remain confident in one's own abilities shape the level of self-efficacy that person has. Each life period brings about a new set of challenges. Successes and failures during these periods shape the self-efficacy of people and cause it to increase or decrease at the same time.

In conclusion, while there are various studies that use teacher age as a demographic variable, there is a lack of research that correlates age specifically with self-efficacy. When looking at studies that do contain this correlation, results of the studies are contradictory. This contradiction may be expected because self-efficacy is ever-changing and evolving. Bandura (1994) recognized that age does not affect self-efficacy, but life periods that correspond with specific age ranges present changes in self-efficacy consistently.

Age and Technology Implementation

Multiple past studies have concluded that achieving technology integration into classroom instruction is a slow and complex process that is influenced by many factors, one of which is demographic variables (Inan & Lowther, 2010; Levin & Wadmany, 2008; Valcke, Rots, Verbeke, & van Braak, 2007). A gap in literature exists that analyzes the effect that age plays on the successful integration of technology into classrooms (Henry, 2008).

Previous research conducted by Dewey (1938) suggested that as adults age and mature they view all new ideas and knowledge through the lens of their own experiences and apply those experiences to make sense of new information. As adults begin to age, the number of experiences they have expand. Experiences, along with active participation, relevancy, and purpose create new understanding by linking information to prior knowledge and are integral characteristics of an effective learning environment. Dewey stated:

> The formation of purpose is a rather complex intellectual operation. It involves (1) observation of surrounding conditions, (2) knowledge of what has happened in similar situations in the past, a knowledge obtained partly by recollection and partly from the information, advice, and warning of those who have had a wider experience and (3) judgment which puts together what is observed and what is recalled to see what they signify. (p. 44)

Henry (2008) conducted a study on the relationship of age, gender, and personality style on the level of technology implementation by professors at the university level. Findings supported the theory of Dewey (1938) indicating that older faculty members had higher levels of technology implementation than their younger counterparts. Henry (2008) assumed the findings were a result of older faculty members being more comfortable in their content area and teaching methods, therefore allowing them more time and thought in designing learning experiences that implement technology for teaching and learning.

Much conflicting research exists to suggest that age has no impact on technology implementation at all. Inan and Lowther (2010) concluded that age did not have a significant impact on technology integration in a study analyzing factors that affect technology integration in k-12 classrooms. Van der Kaay and Young (2012) analyzed age related differences in technology use among community college faculty to find that older faculty were no less likely than younger faculty to use technology. The study did indicate that the overall technology use among older faculty was slightly less than that of younger faculty. Hermans et al. (2008) mirrored other findings in a study that analyzed the impact of primary school teachers' educational beliefs on the classroom use of computers. Findings indicated that age did not contribute to technology integration in classrooms. Finally, McConnell (2011) discovered that age did not significantly contribute to the technology integration of teachers in a Texas private school.

In summary, research has indicated that teacher age does not play a significant role in technology integration in classrooms. While Dewey (1938) suggested that age expanded the experiences of adults to make them more comfortable with trying new things, research does not support this theory in regard to age and technology.

Self-Efficacy and Teaching Experience

Teachers' self-efficacy beliefs are believed to be the most malleable in the early stages of teachers' careers and increase and become firmly established as teachers gain experience (Wolters & Daugherty, 2007). Once self-efficacy beliefs have been established firmly, it is difficult to change them without a shock of some kind to provoke a reassessment. Mastery experiences are considered to be the most potent source of self-efficacy (Bandura, 1997), so it

would seem plausible that teachers with more experience would exhibit higher levels of self-efficacy. However, conflicting research exists regarding whether experience plays a role in self-efficacy at all or if self-efficacy fluctuates over the course of a career. Regardless, prior research has shown distinctions do exist between novice teachers and those teachers who are more experienced with regard to pedagogical knowledge, classroom management, problem solving, decision making, and sensitivity to classroom events (Palmer, Stough, Burdenski, & Gonzales, 2005).

Research regarding experienced teachers has shown that experienced teachers generally know more about the content they teach, have different attitudes regarding their students, and behave differently in the classroom than novice teachers do (Wolters & Daugherty, 2007). Blackburn and Robinson (2008) suggested that experienced teachers' mastery experiences should allow them to perfect their preferred learning styles. Tschannen-Moran and Hoy (2007) stated that experienced teachers may develop higher self-efficacy due to the real successes they experience with students in the classroom. Many of the characteristics used to distinguish experienced teachers from novice teachers have been tied to greater teacher effectiveness (Palmer et al., 2005). Increased experience as a teacher has been associated with higher levels of teacher self-efficacy (Ross, Cousins, & Gadalla, 1996). Wolters and Daugherty (2007) found that teachers with additional years of experience felt more confident in their ability to employ instructional and assessment practices that would benefit even the most difficult students. More experienced teachers were also reported to have greater confidence in their ability to avoid classroom disruptions and provide adequate classroom management. Hoy and Tschannen-Moran (2007) concluded that experienced teachers exhibit higher mean scores of self-efficacy than novice teachers. While research exists to corroborate that experienced teachers have higher

levels of self-efficacy, many researchers suggest this could be because all of the lower level teachers have already left the profession (Hartfield, 2011; Swan et al., 2011).

Novice teachers are limited in their number of mastery experiences due to the lack of time spent in the classroom (Hartfield, 2011). However, research suggests that although novice teachers have lower self-efficacy in general, student teachers actually enter the profession with an enlarged level of efficacy due to the mastery experiences obtained during student teaching (Knoblock, 2006). Woolfolk-Hoy and Burke-Spero (2005) mirrored these findings by suggesting that soon to be teachers raise their level of self-efficacy because of the student teaching process. A vast array of research exists to suggest that novice teachers actually exhibit high levels of self-efficacy the first few years of teaching (Blackburn & Robinson, 2008; Epps, Foor, & Cano, 2010; Whittington, Mcconnell, & Knoblock, 2006). However, teacher self-efficacy was found to decline after the first year due to the removal of support that is normally present during the student teaching process (Woolfolk-Hoy & Burke-Spero, 2005). Swan et al. (2005) supported this claim by concluding that teacher self-efficacy was highest among teachers at the conclusion of their student teaching experience but lowest after their first full year of teaching.

A new array of research has emerged to suggest that self-efficacy actually fluctuates over the course of a teaching career. Klassen and Chiu (2010) suggested that teachers increase in self-efficacy through their early years and into the mid-career years but decrease in efficacy as they enter the last stages of their careers. Gu and Day (2007) yielded similar results by finding that most teachers in mid-career experience increases in motivation and commitment, whereas teachers who are later in their careers experience a decline in motivation and commitment, thus decreasing self-efficacy. This suggestion is backed by Huberman's (1989) original study on the professional life cycle of teachers. Huberman contended that teachers undergo a process of

survival and discovery the first few years of teaching where self-doubt and enthusiasm intersect. After about 4 years to 6 years into a career, teachers enter into a stabilization mode where they are committed to the profession. 7 to 18 years of teaching marks a period of reassessment where teachers begin to question career choices, while 19 to 30 years begins a period of serenity. The serenity period provides a spur in enthusiasm and self-acceptance. Finally, teachers in their final years of teaching move into a disengagement period marked by either serenity or disappointment.

Difficulty arises when trying to make sense of conflicting research regarding self-efficacy and the effect that experience plays in its role. Bandura (1997) suggested that self-efficacy may not be uniform from early to late adulthood. Therefore, self-efficacy beliefs may change over the course of a career due to life events and career challenges. Self-efficacy beliefs are not static and reflect a lifelong process of development that changes according to circumstances (Klassen & Chiu, 2010). Self-efficacy beliefs may be more complex than originally thought.

Experience and Technology Implementation

Research regarding the effect that teaching experience has on technology implementation provided conflicting results. A few studies conducted suggest that less experienced teachers implement technology in their classroom more than their experienced counterparts. Baek, Jong, and Kim (2008) concluded that experienced teachers are less ready to integrate technology in the classroom than less experienced teachers. Inan and Lowther (2010) discovered that a teacher's age and years of teaching have negative effects on both their computer proficiency and technology integration, suggesting that the older teachers are less computer proficient and

integrate technology less than younger ones. These findings were supported in an earlier report from the U.S. National Center for Educational Statistics (2000) that reported that teachers with less experience in teaching are more likely to integrate computers in their teaching than teachers with more teaching experience.

In direct contrast to the findings above, Lau and Sim (2008) revealed that older teachers frequently use computer technology in the classrooms more than younger teachers. The major reason proposed for these findings was that older teachers had rich experience in teaching, classroom management, and computer competency that made it easier for them to integrate technology into their teaching. Russell, O'Dwyer, Bebell, and Tao (2007) explained that the quality of technology integration was related to the years of teacher service. Henry (2005) revealed a positive relationship was identified that indicated that as the years of experience of teachers increased, the level of technology implementation also tended to increase.

Few studies revealed that no relationship existed between years of teaching experience and technology integration. Gorder (2008) found no significant difference for technology integration and technology uses based on teaching experience. McConnell (2011) mirrored these findings by concluding that teaching experience did not show a significant relationship to level of technology implementation in a study regarding factors that affect technology integration.

In conclusion, conflicting research exists regarding the impact that years of experience has on technology implementation. While some studies yielded that technology integration increases with teacher age, others indicated that younger teachers use technology more in the classroom. Furthermore, recent research concluded that teaching experience has no effect on technology integration at all.

Self-Efficacy and Gender

Research studies regarding gender differences in the self-efficacy levels of students and the sources of self-efficacy revealed that no sex differences in the strength of the relationship between the sources and self-efficacy have been found in science, mathematics, and writing (Britner & Pajares, 2006). However, Usher and Pajares (2008) found that girls relied primarily on social persuasion when forming self-efficacy, while boys relied more on mastery experiences. When it comes to specific subjects, boys reported stronger mastery experiences and lower anxiety in mathematics and science (Britner & Pajares, 2008; Lent, Lopez, Brown, & Gore, 1996). Girls reported greater mastery experiences and lower anxiety in writing (Pajares & Usher, 2008). Girls have also reported more vicarious experiences in wring, mathematics, and general academics, which suggests that girls could be more sensitive to messages they receive from social models (Joet, Usher, & Bressoux, 2011).

Studies regarding the gender differences in adults proved conflicting. Pankow (1995) concluded that women have a more external locus of control and lower self-efficacy than men. Directly contrasting this research, Eberle (2011) revealed that females have a higher self-efficacy than males. Adding to the confusion, Jenks (2004) found no association between gender and self-efficacy at all.

The self-efficacy of teachers in regard to gender yield similar results to those found above. Most studies found that females report higher teacher self-efficacy than males (Anderson, 2011; Anderson, Greene, & Lowen, 1988; Raudenbush, Rowan, & Cheong, 1992). Still, other studies found no differences in teacher self-efficacy by gender at all (Lee, Dedrick, & Smith,

1991). Klassen and Chiu (2010) found that female teachers have lower teacher self-efficacy in the area of classroom management but not in instructional strategies and student engagement.

Bandura (1995) supported the finding that females are not as self-efficacious in the areas of science, mathematics, and technology by noting that women are not choosing occupations in these career fields, along with others that tend to be male dominated. Bandura (1995) acknowledged that women's technical and quantitative capabilities, as well as their career aspirations, are influenced heavily by family, culture, mass media, and the educational systems. Evidence suggests that women's capabilities and influence on the economic and creative life of society remains unrealized by many (Bandura, 1995).

Gender and Technology Implementation

Previous research regarding the role that gender plays on the integration of technology have cited that male students have more positive attitudes towards computers than female students, females use computers at lower levels than males due to lack of interest, and females view technology as a tool rather than a toy like most males (Tsai, Lin, & Tsai, 2001). Male teachers have been shown to use more technology in their teaching and learning processes than female teachers (Jamieson-Proctor, Burnett, Finger, & Watson, 2006; Kay, 2006). More recent research has found few studies that support these claims that males use and integrate technology more than females. However, Bebetsos and Antoniou (2009) did discover that men were more positive in the idea of using computers than women.

Current research studies regarding gender and technology implementation have found no significant difference between males and females in relation to technology implementation. Teo, Chai, Hung, and Lee (2008) concluded that gender was not a significant predictor of technology

use in the classroom through a study that analyzed technology use among preservice teachers. Henry (2005) mirrored these findings in a study of the relationship between gender, age, and personality style with the level of technology implementation at the university level, stating that there was no difference in the level of technology implementation in university courses based on gender, age, and personality style. Joseph and Buehl (2009) examined the effects of technology use in the classroom on teacher self-efficacy that indicated there were not statistically significant gender differences in teacher self-efficacy for technology use. Baker, Al-Gahtani, and Hubona (2007) discovered that gender was not a significant variable on new technology implementation in a study of the effects of gender on new technology implementation in a developing country. Finally, in a study of teacher perceptions of instructional technology integration in the classroom, Gorder (2008) concluded that there are no significant differences in the means of males and females when looking at technology integration and use.

A possible reason for the conflict in findings between earlier and more current studies could be due to the increased use of computers for learning in schools and the opportunities created by policy-makers for all students to obtain computer skills to cope with greater challenges in education (Teo et al., 2008).

In conclusion, while earlier research indicated that males were more likely to use technology and incorporate it into the classroom, more recent studies indicate no significant differences between technology used related to gender. It is important to note that no credible studies could be found to indicate that females use computers or implement their use in the classroom more than males. This is an area where further research may need to be conducted.

Professional Development

"Professional development refers to many types of educational experiences related to an individual's work" (Mizell, 2010, p. 3). People in a variety of professions participate in professional development to help them learn and apply new knowledge and skills that will improve job performance. Professional development for teachers has become increasingly important due to large-scale reform initiatives that place large accountability on teachers to produce students who perform well on high-stakes standardized tests. The success of ambitious reform initiatives in education rests on the qualifications and effectiveness of the teachers (Corcoran, Shields, & Zucker, 1998). Mizell (2010) stated:

> In education, research has shown that teaching quality and school leadership are the most important factors in raising student achievement. For teachers and schools and district leaders to be as effective as possible, they continually expand their knowledge and skills to implement the best educational practices. (p. 3)

Mizell (2010) admitted that colleges and universities cannot provide the extensive range of experiences in learning that are necessary for graduates to become effective teachers. Educators who do not seek additional professional development do not improve their skills, and thus, student learning is affected negatively. Effective professional development is often seen as vital to school success and teacher satisfaction (Professional Development, 2011). Professional development that enables teachers to develop knowledge and skills they need to address the learning challenges of their students is considered to be of high quality. Garet, Porter, Desimone, Birman, and Yoon (2001) concluded that core features of quality professional development that have positive effects on teachers' increases in knowledge and skills and changes in classroom practice contained a focus on content knowledge, opportunities for active learning, and coherence with other learning activities. Additionally, the form of activity, collective

participation of teachers from the same school, grade, or subject, and the duration of the activity also significantly affect teacher learning.

Quality professional development is beneficial to schools, students, and teachers. Schools that promote professional development show the importance of ongoing learning and create a learning culture for both students and teachers. When teachers engage in quality professional development, they are able to gain knowledge about how students learn, what impedes students' learning, and how teacher instruction can increase student learning. All of these things benefit the students by allowing the teacher to help them learn more (Mizell, 2010).

While little doubt exists that quality professional development is essential to schools, the professional development system is thought to be broken by many researchers. Hill (2009) argued that "despite evidence that specific programs can improve teacher knowledge and practice and student outcomes, these programs seldom reach real teachers on a large scale. (p. 470). " Advocates have switched from professional development that focused on school-based learning, coaching, and subject matter content to the analysis of assessment of data within the period of 20 years (Hill, 2009). The constant changing of formats has not allowed teachers time to perfect any strategy to increase student achievement. Adding to the problem, administrators have historically favored workshops that bring in outside consultants to train teachers in a one-time seminar on the topic of choice that year. These workshops were highly popular, according to the survey data provided by the National Center for Educational Statistics in the 1999-2000 school year. This study provided that 95% of teachers took part in workshop training in the past 12 months, compared with 74% who worked in instructional groups and 42% who participated in peer observation (Broughman, 2006). While the National Center for Educational Standards has conducted two additional surveys like this one, findings have not been made public as of yet.

A study released by the Stanford Center for Opportunity Policy in Education, in partnership with Learning Forward, provided some up-to-date information on the most recent professional development opportunities, stating that U.S. teachers spend more time instructing students than they do participating in professional development with their peers. This same study also highlighted that in 2008, 78% of beginning teachers claimed to have a mentor teacher but not always in the teacher's content area. Furthermore, the intensity of professional development decreased between 2004 and 2008.

While many researchers have suggested answers to the issues surrounding professional development for teachers, the consensus is that more time must be allotted for professional development opportunities, teachers must take advantage of these opportunities when given, and the learning environment for professional development must take place in a more active and coherent intellectual community where ideas can be exchanged collaboratively with peers (Garet el al., 2001; Hill, 2009 ; Professional Development, 2011).

Self-Efficacy and Professional Development

More challenging standards, high stakes testing, and accountability have created a renewed interest in the professional development of teachers through high quality in-service training and a concern of how to design and deliver training in ways that will improve teaching and student learning (Bray-Clark & Bates, 2003). While the reasons for an educator's lack of self-efficacy may be complex, a major factor must surely be the lack of knowledge and skills to address students' specific learning challenges (Mizell, 2008). Therefore, a link may exist between teacher self-efficacy and professional development. Bray-Clark and Bates (2003) argue

that teacher self-efficacy is a key driver of teacher effectiveness and should be a central focus in professional development opportunities of teachers. Referring to the importance of professional development on teacher efficacy, Mizell (2008) stated:

> High quality professional development is an essential tool for increasing the self-efficacy of your teachers. The more teachers know, and the better they are able to apply their knowledge to students' real world learning challenges, the greater will be their self-efficacy. (p. 6)

A small number of studies have investigated the effects of professional development and teacher efficacy. Powell-Moman and Brown-Schild (2011) investigated the impact a 2-year professional development program had on teacher self-efficacy for inquiry-based instruction finding that all participants reported increases in their self-efficacy for inquiry-based teaching and greater focus on the depth of content instead of covering all course objectives. Morrison and Estes (2007) produced similar results indicating that teacher participation in professional development that focused on inquiry-based instruction increased teacher use of inquiry-based instruction and self-efficacy pertaining to its use. Ross and Bruce (2007) concluded that the contributions to teacher self-assessments and information on innovative instruction provided by professional development presenters heightens teacher efficacy, which influences teacher goal setting and effort expenditures. Brown (1994) argued that score improvements on teacher efficacy scales over a duration of time is sufficient evidence of an effect resulting from quality professional development. Teacher efficacy is found to be higher among those who more faithfully implement the practices recommended by professional development (Rimm-Kaufman & Sawyer, 2004). Finally, Ross and Bruce (2007) tested a professional development program that focused on the four sources of teacher efficacy identified in social cognitive theory by using a control group and a treatment group of teachers to analyze efficacy score results. Results

showed that teachers who received the professional development outperformed those in the control group on three areas of teacher efficacy with classroom management being statistically significant.

Conflicting opinions exist regarding the quality of professional development that school systems are providing to their teachers. However, research indicates that when quality professional development opportunities are given to teachers and teachers actively participate in them, results will yield an increase in teacher self-efficacy.

Technology Implementation and Professional Development

Professional development is one means that can change the self-efficacy of a teacher and the level that they integrate technology in the classroom (Overbaugh & Lu, 2008). High quality professional development is central to any education improvement effort, especially those that pertain to the integration of technology to support classroom instruction (Martin, Strother, Beglau, Bates, Reitzes, & Culp 2010). Professional development is useful in providing teachers with the knowledge and practice they need to implement technology successfully. More specifically, professional development has been identified as one of the most important factors influencing teachers' integration of technology into the classroom (Lawless & Pellegrino, 2007).Successful implementation of educational technologies depends on high quality professional development along with on-going support (Lemke & Fadel, 2006). Teachers who have successfully integrated technology in their classrooms have reported participating in professional development that helped them understand how curriculum, standards, and technologies connect (Penuel, 2006).

Numerous studies regarding the effect that professional development has on technology integration can be found. Some of these studies supported the notion that professional development programs increase technology integration in the classroom. Giordano (2008) found that teachers began to use the internet for instructional purposes and that this usage became permanent at the end of a professional development program. Brinkerhoff (2006) evaluated the effects of a long duration professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. Results indicated that participants perceived an increase in their technology skills as a result of their experiences in the academy were less fearful and more confident toward technology and felt the academy had altered their teaching. Lavonen, Juuti, Aksela, and Meisalo (2006) concluded that the technology usage skills of science teachers increased and they integrated technology with learning environments after the completion of a professional development program. Mollette, Townsend, Townsend, and Cohen (2009) measured the effects of collaboration and professional development on the technology integration and student achievement in K-12 classrooms. Results indicated that the district and school administrators' feelings toward the program were positive with an eagerness to continue implementing technology in the future years. The program evaluated teachers' increased level of skill and comfort with technology by 2.9 points in one group and 9.2 points in the other. Voogt, Almekinders, van der Akker, and Moonen (2005) discovered that teachers' attitudes towards computers changed in a positive manner after implementing a successful professional development program. Moersch and Ondracek (2005) discovered that teachers who have a constructivist teaching practice and are given professional development opportunities that use technology for learning implement technology at higher levels. Finally, Mueller et al. (2008) found that teacher confidence could be enhanced when teachers were allowed to practice using

technology in their classrooms or were able to collaborate with other teachers who were having success at integrating technology.

Conflicting research indicated that while professional development programs are increasing computer skills among teachers, the integration of technology into curriculum is still at a limited level (Brinkerhoff, 2006; Yurkadal, Yildez, Caker, & Uslu, 2010). Glazer, Hannafin, Polly, and Rich (2009) concluded that although most teachers who entered a professional development program increased their knowledge, skills, ideas, and lesson plans, only about a third of them were considered proficient at the end of the program. Brinkerhoff (2006) identified that while a significant change occurred among professional development program participants in self-assessed technology skills and computer self-efficacy, little to no change occurred in self-assessed technology integration beliefs of these teachers. Finally, Yurdakul et al. (2010) revealed that while the professional development programs were capable of increasing technology usage skills, they failed to induce substantial changes for the technology integration.

Providing quality professional development opportunities has a large impact on the effectiveness of the program to increase technology integration. Lawless and Pellegrino (2007) observed that the most effective professional development opportunities are long-term and embedded in day-to-day practices. These programs provide opportunities for higher-order thinking and application. For professional development to make a difference in how teachers use technology in the classroom, it must be specific to teachers' content (Shriver, Clark, Nail, Schlee, & Libler, 2010) and demonstrate the relevancy of the pedagogy being used (Kanaya, Light, & Culp, 2005). Hew and Brush (2007) concluded that effective professional development for technology integration requires a focus on content that includes technology and skills, technology-supported pedagogical knowledge and skills, and technology-related classroom

management knowledge and skills. It is important that professional development programs also include information about how these tools can be used in specific ways within specific content domains to increase student content learning outcomes (Ertmer & Ottenbreit-Leftwich, 2010).

Common Core Standards

"The Common Core standards released in 2010 represent an unprecedented shift away from disparate content guidelines across states in the areas of English, language arts, and mathematics" (Garet et al., 2011, p. 103). The Common Core Standards Initiative, led by the National Governors Association Center for Best Practices and the Council of Chief State School Officers, developed the new standards in an effort to establish consistent expectations for student knowledge and skills to be developed from kindergarten through 12th grade (National Governors Association Center for Best Practices, 2010). The Common Core standards focus on what students are to learn at each grade level and not on how that content should be taught in the classroom. Although the U.S. Department of Education was not involved directly in creating these new standards, adopting a common set of standards is included in the criteria of the scoring rubric for Race to the Top grant awards (Garet et al., 2011). While No Child Left Behind is clear that federal government is not to be involved in setting content standards and that states must set their own standards (Polikoff, Porter, & Smithson, 2009), the current administration is applauding and encouraging the work of the National Governors Association and the Council of Chief State School Officers (Mathis, 2010). An outpouring of funds from the administration has included a budget of $2.5 billion to align state curriculum with the Common Core as well as an additional $400 million for developing standardized tests that would align with the Common Core. The current administration has also announced that it intends to require all states to have

college-ready standards in reading and math developed by the state as a condition in qualifying for Title I funding (Mathis, 2010). President Barack Obama (2010) stated in regard to the need for rigorous state standards:

> Because economic progress and educational achievement go hand in hand, educating every American student to graduate prepared for college and success in a new work force is a national imperative. Meeting this challenge requires that state standards reflect a level of teaching and learning needed for students to graduate ready for success in college and careers, (White House Statement)

Due to the support of the federal government and the rigorous requirements set forth by it, as well as the argument that current state standards are often disparate and misguided, 45 states have officially adopted the Common Core to date. The logical assumption is that the other five states will eventually follow suit.

Garet et al. (2011) claim the idea of a national and uniform curriculum offers several benefits. The benefit of having shared expectations offers consistency among states when comparing state mandated test scores. A national curriculum may represent a greater focus on specific areas and topics than state-based assessments typically do. A uniform curriculum across the U.S. would be efficient in the sense that it would no longer be necessary for each state to develop its own content standards and assessments. Lastly, a national curriculum would provide a higher quality of assessments with the possibility of delivering assessments electronically to make them more animated and engaging for students .The Obama administration asserts that common standards are necessary for students to compete in a global economy. Common standards are acknowledged as being important in achieving the goal for all students regardless of circumstance to perform at high levels by the Obama Blueprint.

Zhao (2012) argued with the idea of a national curriculum stating:

> NCLB has led to a narrowing of curriculum, demoralization of teachers, explosion of cheating scandals, reduction of teaching to test-preparation, weakening of public education, and deprivation of the disadvantaged children of a meaningful education experience. The national standards movement in the U.S. has coincided with a significant decline in creativity over the last few decades.

Zhao (2012) also declared the Common Core specifically will not make children college ready because the problem is poverty and not standards in the classroom. The Common Core still places a huge amount of accountability on test scores, which are a poor measure of both the child's quality and the teachers. Strauss (2012) echoed these beliefs by contending that the Common Core standards ignore the real issue in schooling, which is poverty. The Common Core assume that what students need to know is covered by one of another core subjects, kill innovation and creativity, and are set up for national standardized tests that can't evaluate complex thought processes.

Regardless which side of the argument you are on, little research currently exists on the actual impact of common national standards in the United States because there have never been standards such as these (Mathis, 2010). Therefore, in order to determine and evaluate the effectiveness of the Common Core, more time is needed.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The purpose of this study was to identify the combination of factors that pertain to the implementation of new technologies in the classroom. Specifically, this research was an analysis of the age of the teacher, years of teaching experience, quality of professional development in classroom technologies, and teacher self-efficacy as defined by Bandura (1997) to examine the manner in which these factors relate to implementing new technologies in the classroom. This chapter describes the research questions and null hypothesis, research design, population, instrumentation, data collection, and analysis of the data.

The purpose of a research design is to specify a plan for generating empirical evidence that will answer proposed research questions and draw the most valid, credible conclusions from those answers (McMillan & Schumacher, 2006). Quantitative research designs test theories by examining the relationship between variables. These variables can usually be measured using an instrument so that numbered data can be analyzed through statistical procedures (Creswell, 2009). Designs that are nonexperimental describe and examine relationships between different phenomena without manipulating conditions directly (McMillan & Schumacher, 2006). This study uses nonexperimental, quantitative research with a comparative and correlational design.

Research Questions and Null Hypotheses

The following questions and their corresponding null hypotheses relating to teachers' age, years of experience, professional development, and self-efficacy were addressed:

1. Is there a significant correlation between teacher age and teacher self-efficacy scores?

Ho1. There is no significant correlation between teacher age and teacher self-efficacy scores.

2. Is there a significant correlation between years of teaching experience and teacher self-efficacy scores?

Ho2. There is no significant correlation between years of teaching experience and teacher self-efficacy scores.

3. Is there a significant correlation between the hours spent in technology professional development and teacher self-efficacy scores?

Ho3. There is no significant correlation between the hours spent in technology professional development and self-efficacy scores.

4. Is there a significant correlation between teacher age and technology use in the classroom?

Ho4. There is no significant correlation between teacher age and technology use in the classroom.

5. Is there a significant correlation between years of teaching experience and technology use in the classroom?

Ho5. There is no significant correlation between years of teaching experience and technology use in the classroom.

6. Is there a significant correlation between the hours spent in technology professional development and technology use in the classroom?

Ho6. There is no significant correlation between the hours spent in technology professional development and technology use in the classroom.

7. Is there a significant correlation between teacher self-efficacy scores and technology use in the classroom?

Ho7. There is no significant correlation between teacher self-efficacy scores and technology use in the classroom.

8. Is there a significant difference between the teacher self-efficacy scores of males and females?

Ho8. There is no significant difference between the teacher self-efficacy scores of males and females.

9. Is there a significant difference between the classroom technology use of females and males?

Ho9. There is no significant difference between the classroom technology use of females and males.

Instrumentation

A survey instrument was used with 11 questions regarding demographics, self-efficacy, technology use, and professional development. All questions regarding self-efficacy were

based on a four-point Likert-type scale. Permission to use the teacher self-efficacy scale developed by Schwarzer, Schmitz, and Daytner (1999) is available for free and is copyrighted by Ralph Schwarzer on his website. The survey was created in a way that required all participants to answer each question. Participants were advised that the survey would be used for the purpose of research, all responses were confidential, participation was voluntary, and the information collected could not be used to identify them in any way.

Cronbach's alpha was found to be between .76 and .82. To further establish validity, the survey was first administered to classroom teachers, instructional coaches, and administrators in a doctoral statistics class at East Tennessee State University. Modifications were made based on feedback from this pilot group. A second group of classroom teachers who were participating in STEM school training at East Tennessee State University also piloted the survey. Modifications were made based on their feedback as well.

Perceived self-efficacy was gathered by using the teacher self-efficacy scale constructed by Schwarzer, Schmitz, and Daytner (1999). The instrument consists of 10 statements that identify job skills and group them into four major areas: job accomplishment, skill development on the job, social interaction with parents, students, and colleagues, and coping with job stress. These statements were broken down into two questions that required the participant to rate their self-efficacy on a scale of zero to three with one being not at all true and three being exactly true according to each statement given. Schwarzer (1999) identified the four major areas listed above to be of vital importance to successful teaching. Twenty-seven items were developed to assess these major areas explicitly following Bandura's social cognitive theory (1997). Bandura's theory contains a specific semantic structure for self-efficacy items. The subject of all items should be "I" to assess an individual's subjective

belief. “Can” and “able to” should be used to make it clear that the item relates success to personal competence. The items must also include a barrier because self-efficacy expectancies should contain tasks that are considered difficult. The 27 items were narrowed down to 10 to economically assess self-efficacy beliefs with a focus on optimizing the validity in the four areas mentioned.

Tests regarding reliability and validity of the measure resulted in a .76 test-retest reliability.

Population

The population for this study consisted of teachers at 18 different schools in grades kindergarten through five across two school districts in East Tennessee. Three hundred twenty-one teachers within these two districts received a voluntary survey (see Appendix A). One school district contained five elementary schools with approximately 99 teachers in grades kindergarten through five. The other school district contained 13 elementary schools with approximately 222 teachers in grades kindergarten through five. The population was chosen because the school districts had access to the technologies of interest in the survey.

Data Collection

Permission was obtained from the Director of Schools at both participating school districts to collect data for this research study by way of email to prepare for the IRB approval process. Prior to the beginning of this research project, permission to conduct the research was obtained from the Institutional Review Board (IRB) at East Tennessee State University. Upon receiving IRB approval, a meeting was held with the Director of Schools in

each district to establish a time frame for the survey and clarify any additional items that needed to be addressed before administration could begin. The survey was then distributed by a link sent to the directors via Survey Monkey that was forwarded to each school principal through school email. The principals of each school district were given the autonomy to choose whether or not they wished to ask their teachers to be participants in this survey. Principals who chose to do so distributed this link along with an information letter to all teachers in grades kindergarten through five. Teachers were given a 2-week window to respond to the survey. Reminders were sent out by the Director of Schools at each school district after the end of week one and again on the last day to complete the survey.

Data Analysis

Data from the survey instrument were analyzed through a nonexperimental quantitative methodology. *Statistical Package for Social Sciences* (SPSS) data analysis software was used to conduct all data analysis procedures for this study. The data source analyzed was a survey that combined demographic questions with those on self-efficacy and professional development.

All research questions contained a corresponding null hypothesis for a total of nine research questions and nine null hypotheses. Research questions 1 through 7 were analyzed using a series of Pearson and Spearman correlation tests. Questions 8 and 9 were analyzed using independent *t*-tests. Findings of the data analyses are represented in Chapter 4. A summary of findings, conclusions, and recommendations for future research are presented in Chapter 5.

Summary

This study examined the factors that pertain to the implementation of new technologies in the classroom with the specifications of teacher age, years of teaching experience, quality of professional development, and perceived teacher self-efficacy. Teachers from 18 schools within two school districts in East Tennessee were used as the population for this study. A survey instrument was used to collect and analyze data regarding the four factors mentioned above. A Pearson correlation test was conducted to analyze research questions 1 through 7. Independent *t*-tests were conducted to analyze questions 8 and 9. The results of these data are revealed in Chapter 4.

CHAPTER 4

ANALYSIS OF DATA

The purpose of this study was to identify the combination of factors that pertain to the implementation of new technologies in the classroom. Specifically the study analyzed the age of the teacher, years of teaching experience, quality of professional development, and teacher self-efficacy to examine the manner in which these factors relate to implementing new technologies in the classroom. Participants of the study included 124 classroom teachers in grades K-5 in two different East Tennessee school districts.

In this chapter, data were presented and analyzed to answer nine research questions and nine null hypotheses. Data were analyzed from the 10 statements regarding self-efficacy using a four-point Likert-type scale. The remaining questions containing demographic content and classroom technology usage information were analyzed using a multiple choice format. The survey was distributed twice; 321 teachers were invited to participate in the survey and 124 teachers responded. Participants were advised that all responses were confidential and the demographic information collected did not identify participants in the study.

Research Question 1

Research Question 1: Is there a significant correlation between teacher age and teacher self-efficacy scores?

Ho1. There is no significant correlation between teacher age and teacher self-efficacy scores.

A Pearson correlation coefficient was computed to test the relationship between teacher age and teacher self-efficacy scores. The results of the analysis revealed a weak, positive relationship between teacher age (M=42.3, SD=12.15) and teacher self-efficacy scores (M=2.17, SD=.54) and a correlation that was not statistically significant [r(120)=.053, p=.565]. See Table 1 and Figure 1 below. As a result of the analysis Ho1 was not rejected. In general, the results suggest that teacher age does not play a significant role in the self-efficacy of teachers.

Table 1.

Teacher Age Compared to Mean Self-Efficacy Score

Teacher Age	**Mean Self-Efficacy Score**
20-30 yrs. Old	2.17
31-40 yrs. Old	1.93
41-50 yrs. Old	2.06
51-60 yrs. Old	2.00
61-70 yrs. Old	2.39

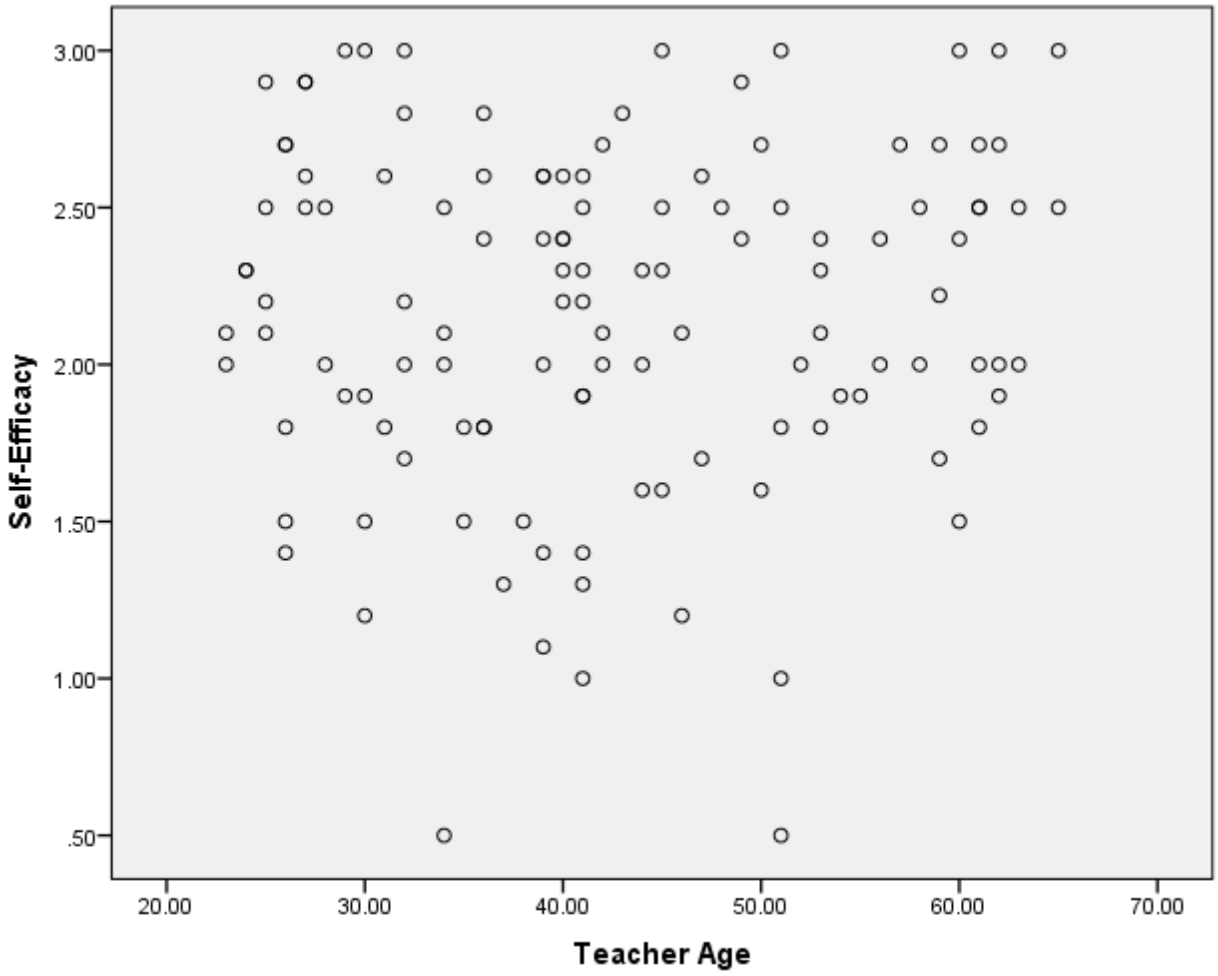


Figure 1. Scatterplot of Participant Responses Regarding Teacher Age and Self-Efficacy. In order to compute a self-efficacy score in regard to the age of the participant, the following items were analyzed from the survey: 2, 5, and 6.

Research Question 2

Research Question 2: Is there a significant correlation between years of teaching experience and teacher self-efficacy scores?

Ho2. There is no significant correlation between years of teaching experience and teacher self-efficacy scores.

A Spearman correlation coefficient was computed to test the relationship between years of teaching experience and teacher self-efficacy scores. The results of the analysis revealed a weak, positive relationship between years of teaching experience (M=2.38, SD=.78) and teacher self-efficacy scores (M=2.17, SD=.54) and a correlation that was not statistically significant [r(120)=.031, p=.735). See Table 2 and Figure 2 below. As a result of the analysis Ho2 was not rejected. In general, the results suggest that teaching experience does not play a significant role in the self-efficacy of teachers.

Table 2.

Mean Self-Efficacy Scores of Teachers Compared to Years of Experience.

Years of Experience	**Mean Self-Efficacy Score**
0-3 Years	2.14
4-10 Years	2.16
11+ Years	2.27

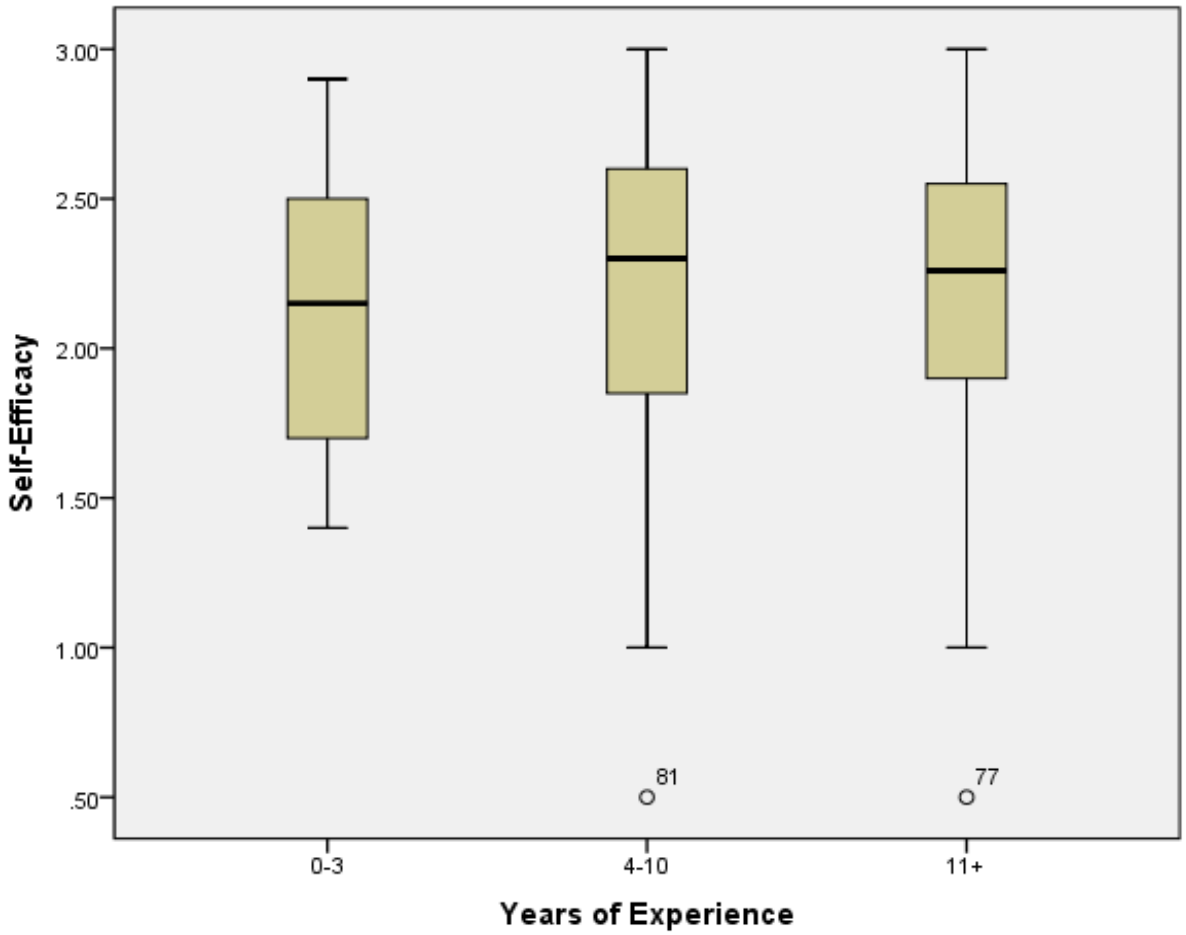


Figure 2. Mean Self-Efficacy Scores of Teachers Compared to Years of Experience in a Boxplot. The numbers 77 and 81 are both mild outliers in this figure. In order to compare the mean self-efficacy scores of participants by looking at their years of experience, the following items were analyzed from the survey: 3, 5, and 6.

Research Question 3

Research Question 3: Is there a significant correlation between hours spent in technology professional development and teacher self-efficacy scores?

Ho3. There is no significant correlation between hours spent in technology professional development and teacher self-efficacy scores.

A Spearman correlation coefficient was computed to test the relationship between the hours spent in technology professional development and teacher self-efficacy scores. The results of the analysis revealed a weak, negative relationship between hours spent in technology professional development (M=1.90, SD=1.02) and teacher self-efficacy scores (M=2.17, SD=.54) and a correlation that was not statistically significant [r(113)=-.034, p=.718]. See Table 3 and Figure 3 below. As a result of the analysis Ho3 was not rejected. In general, the results suggest that hours spent in professional development do not play a significant role in the self-efficacy of teachers.

Table 3.

Hours of Technology Professional Development Compared to Mean Self-Efficacy Score.

Hours of Technology Professional Dev.	**Mean Self-Efficacy Score**
0-4 Hrs.	2.21
5-10 Hrs.	2.30
11-15 Hrs.	2.15
16+ Hrs.	2.22

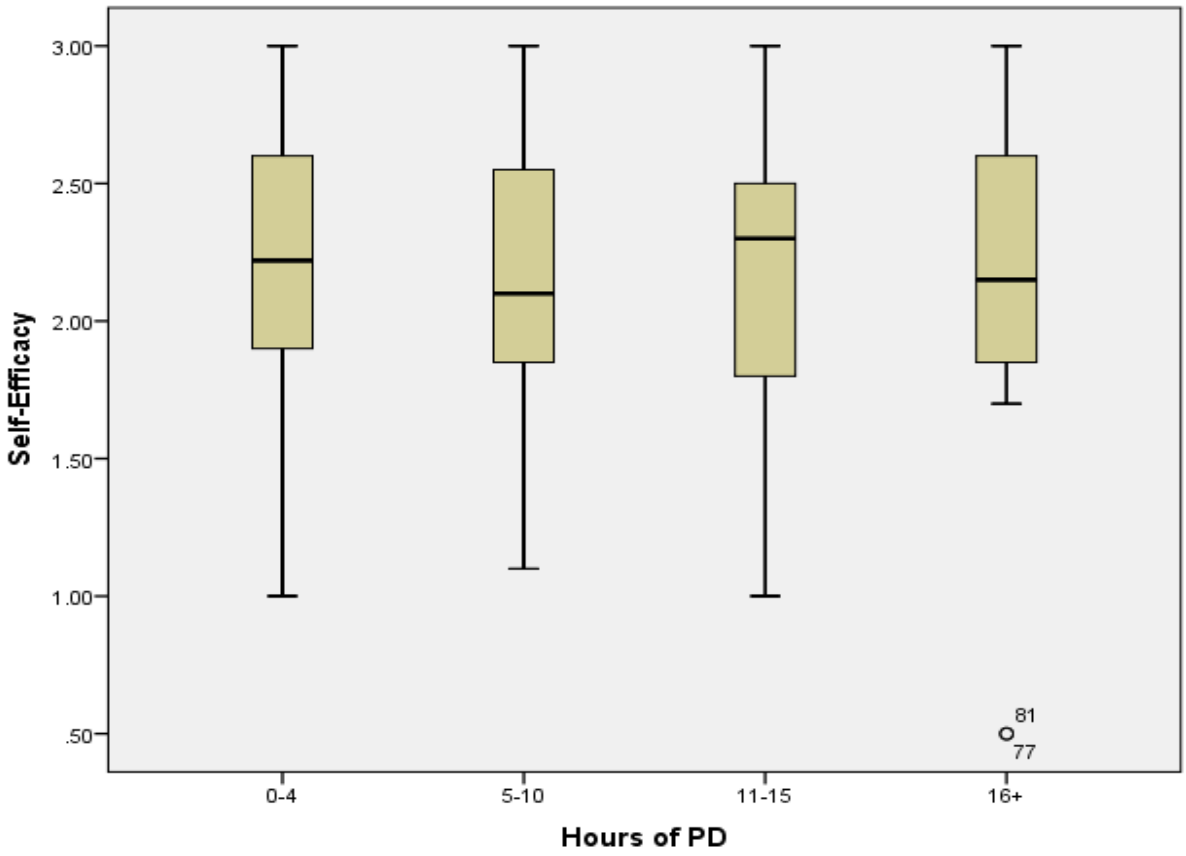


Figure 3. Hours of Technology Professional Development Compared to Mean Self-Efficacy Score in a Boxplot. Both 77 and 81 are mild outliers in this figure. In order to compare the means of self-efficacy scores to hours spent in technology professional development, the following items were analyzed from the survey: 5, 6, and 10.

Research Question 4

Research Question 4: Is there a significant correlation between teacher age and technology use in the classroom?

Ho4. There is no significant correlation between teacher age and technology use in the classroom.

A Pearson correlation coefficient was computed to test the relationship between teacher age and teacher technology use. The results of the analysis revealed a weak, positive relationship between teacher age (M=42.47, SD=12.15) and technology use in the classroom (M=2.17, SD=.69) and a correlation that was not statistically significant [r(123)=.093, p=.332]. See Table 4 and Figure 4 below. As a result of the analysis Ho4 was not rejected. In general, the results suggest that teacher age does not play a significant role in the classroom technology use of teachers.

Table 4.

Teacher Age Compared with Teacher Technology Use.

Teacher Age	**Mean Classroom Technology Use**
20-30 years old	1.80
31-40 years old	2.40
41-50 years old	2.15
51-60 years old	1.96
61-70 years old	2.28

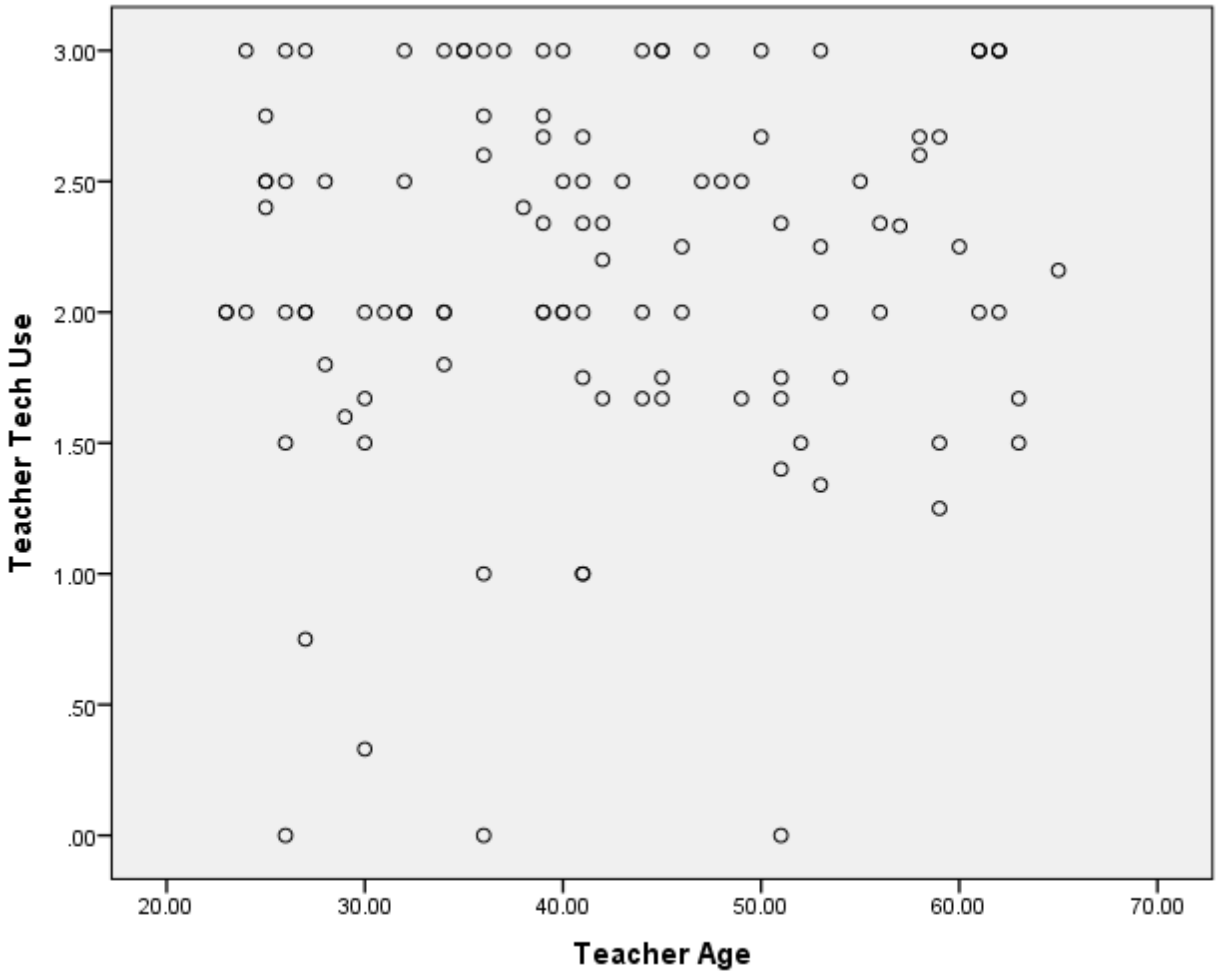


Figure 4. Teacher Age Compared with Teacher Technology Use in a Scatterplot. In order to compare the mean score of teacher age with how often the participants used technology in their classrooms, the following items were analyzed from the survey: 2, 7, 8, and 9.

Research Question 5

Research Question 5: Is there a significant correlation between years of teaching experience and technology use in the classroom?

Ho5. There is no significant correlation between years of teaching experience and technology use in the classroom.

A Spearman correlation coefficient was computed to test the relationship between years of teaching experience and technology use in the classroom. The results of the analysis revealed a weak, positive relationship between years of teaching experience (M=2.38, SD=.79) and technology use in the classroom (M=2.17, SD=.69) and a correlation that was not statistically significant [r(110)=.04, p=.68]. See Table 5 and Figure 5 below. As a result of the analysis Ho5 was not rejected. In general, the results suggest that years of teaching experience do not play a significant role in the use of technology in the classroom.

Table 5.

Years of Teaching Experience Compared to Classroom Technology.

Years of Teaching Experience	**Classroom Technology Use**
0-3 Yrs.	2.48
4-10 Yrs.	2.04
11+ Years	2.25

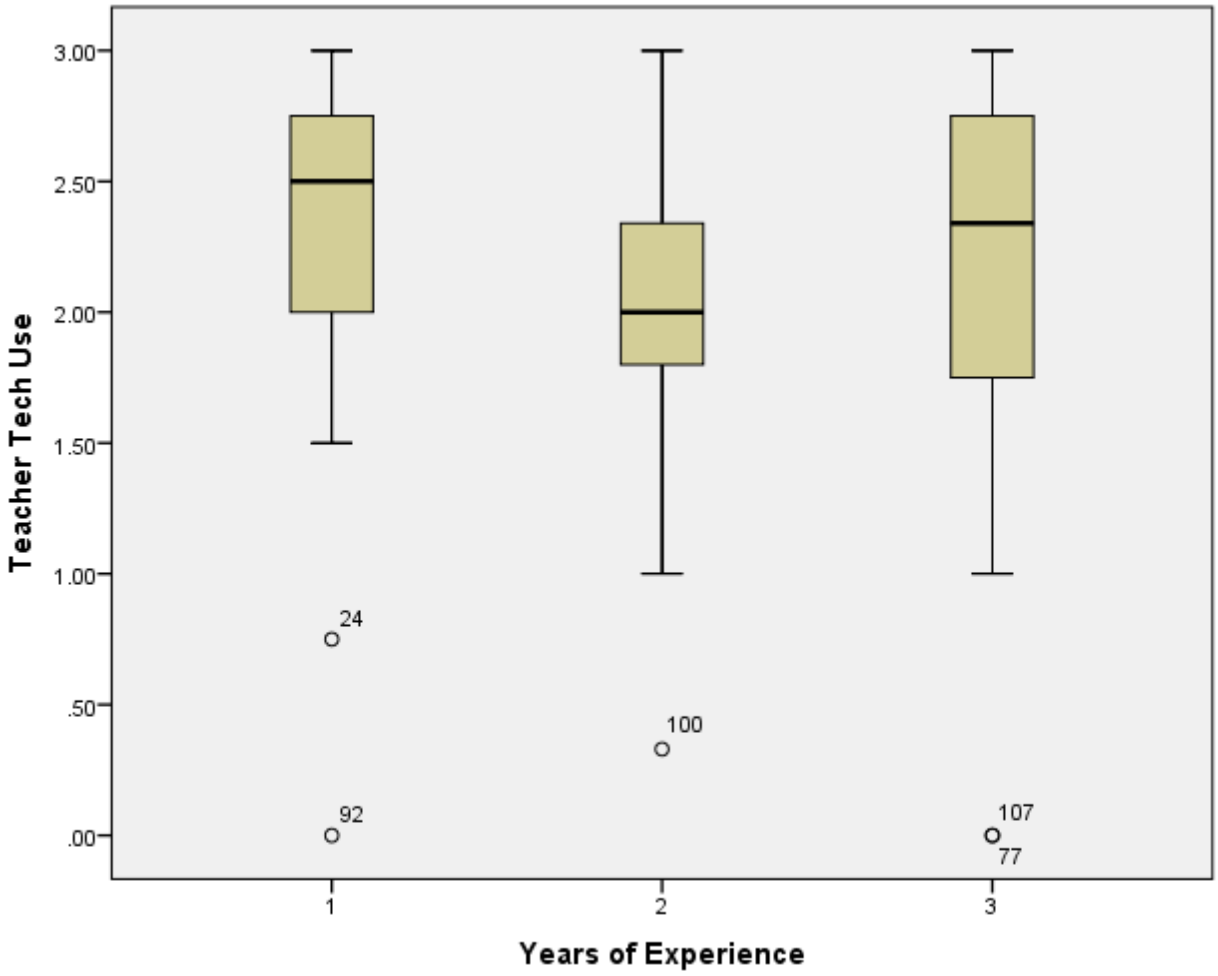


Figure 5. Years of Teaching Experience Compared to Classroom Technology Use in a Boxplot. The numbers 24, 77, 92, 100, and 107 were all mild outliers in this figure. In order to compare the means of teacher classroom technology use with that of teaching experience, the following items were analyzed from the survey: 3, 7, 8, and 9.

Research Question 6

Research Question 6: Is there a significant correlation between the hours spent in technology professional development and technology use in the classroom?

Ho6. There is no significant correlation between the hours spent in technology professional development and technology use in the classroom.

A Spearman correlation coefficient was computed to test the relationship between the hours spent in technology professional development by teachers and technology use in the classroom. The results of the analysis revealed a weak, positive relationship between hours spent in technology professional development (M=1.9, SD=1.02) and technology use in the classroom (M=2.17, SD=.69) and a correlation that was not statistically significant [r(110)=.16, p=.10)]. See Table 6 and Figure 6 below. As a result of the analysis Ho6 was not rejected. In general, the results suggest that the hours spent by teachers in technology professional development do not play a significant role in teacher technology use in the classroom.

Table 6.

Hours Spent in Technology Professional Development Compared to Technology Use in the Classroom.

Hours Spent in Technology Prof. Dev.	**Technology Use in Classrooms**
0-4 Hrs.	2.07
5-10 Hrs.	2.24
11-15 Hrs.	2.19
16+ Hrs.	2.43

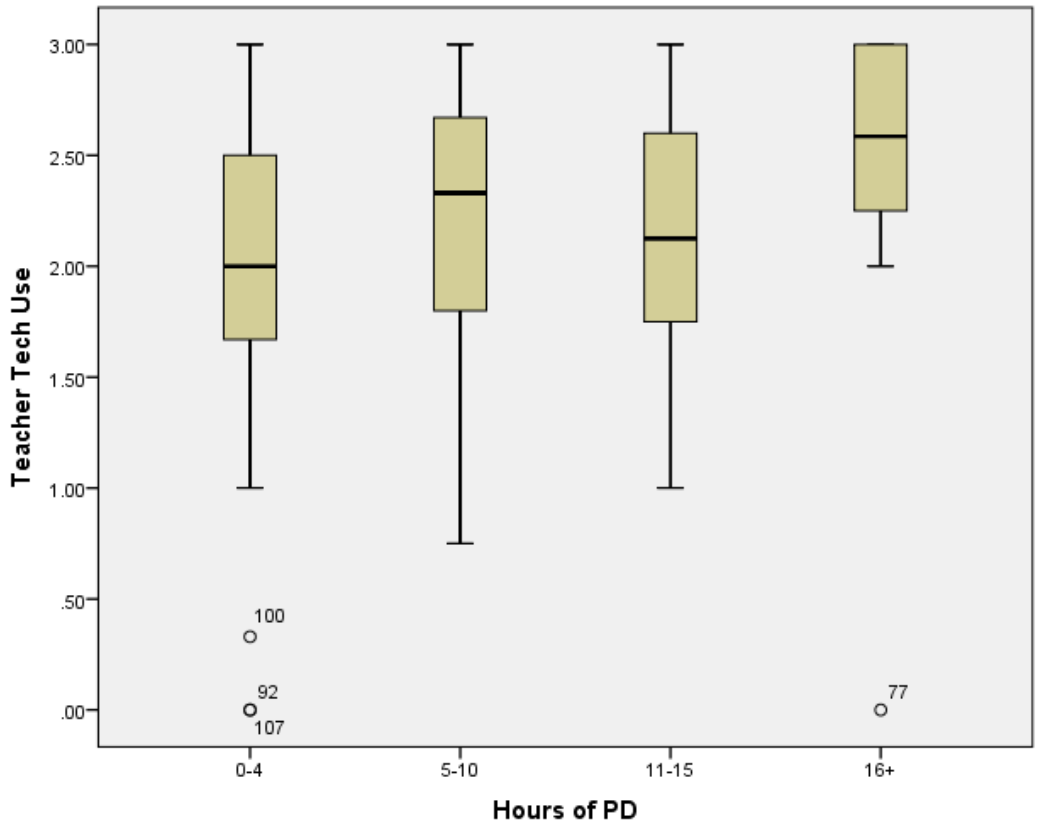


Figure 6. Hours Spent in Technology Professional Development Compared to Technology Use in the Classroom in a Boxplot. The numbers 77, 92, 100, and 107 were all mild outliers in this figure. In order to compare the hours spent in technology professional development with technology use of teachers in the classroom, the following items were analyzed from the survey: 7, 8, 9, and 10.

Research Question 7

Research Question 7: Is there a significant correlation between teacher self-efficacy scores and technology use in the classroom?

Ho7. There is no significant correlation between teacher self-efficacy scores and technology use in the classroom.

A Pearson correlation coefficient was computer to test the relationship between teacher self-efficacy and technology use in the classroom. The results of the analysis revealed a weak, positive correlation between teacher self-efficacy (M=2.17, SD=.54) and technology use in the classroom (M=2.17, SD=.69) and a correlation that was statistically significant [r(110)=.193, p=.043]. See Figure 7 below. As a result of the analysis Ho7 was rejected. In general, the results suggest that teacher self-efficacy is positively related to the technology use of teachers in the classroom.

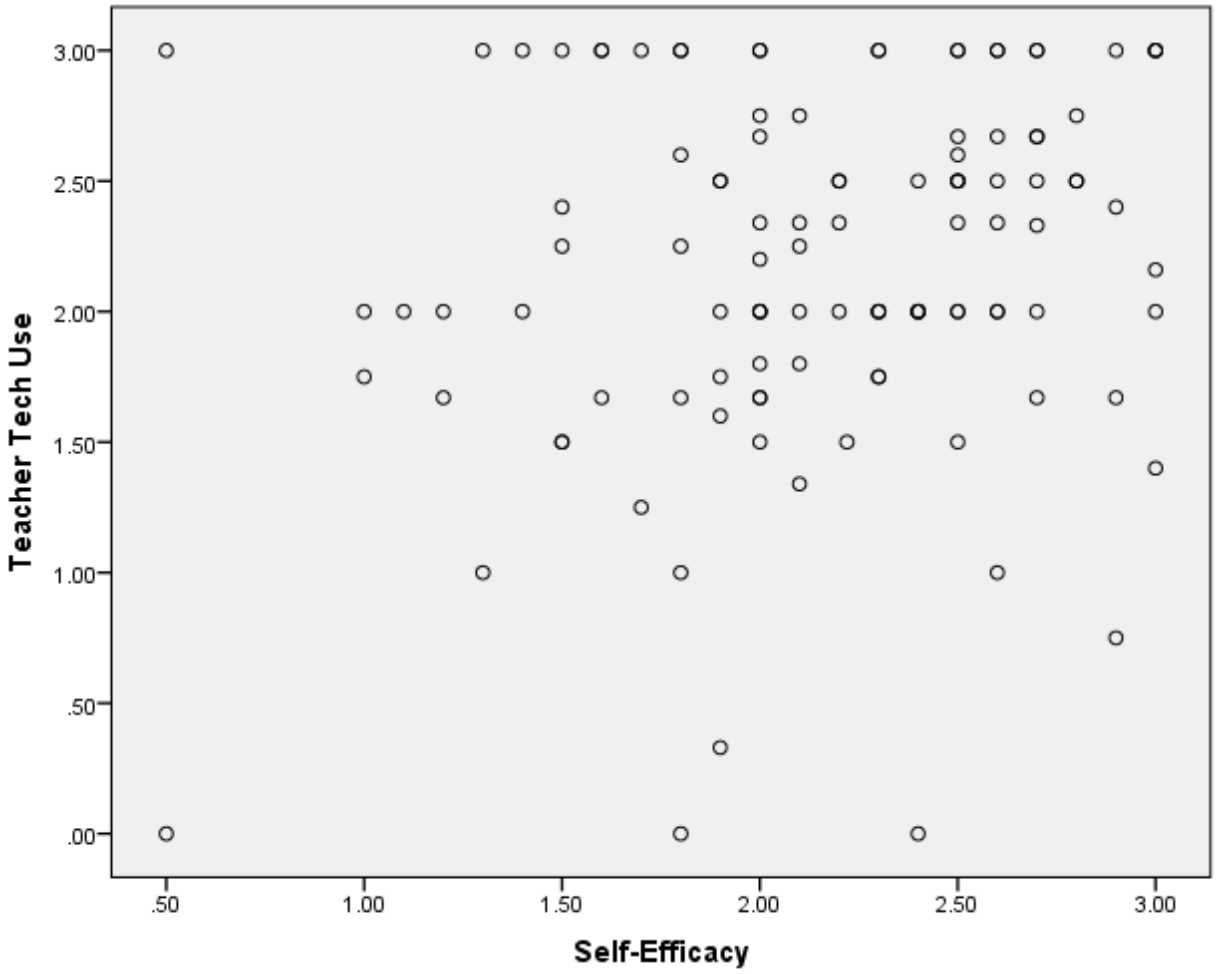


Figure 7. Scatterplot of Teacher Technology Use Compare to Self-Efficacy Scores. In order to analyze teacher technology use and compare it to self-efficacy score, the following items were examined from the survey: 5, 6, 7, 8, and 9.

Research Question 8

Research Question 8: Is there a significant difference between the teacher self-efficacy scores of males and females?

Ho8. There is no significant difference between the teacher self-efficacy scores of males and females.

An independent samples t-test was conducted to evaluate whether self-efficacy scores differ based on gender. A survey instrument was used to measure the self-efficacy of both male and female participants. The mean score on the self-efficacy test was the testing variable and the grouping variable was the gender of the participants. The test was not significant, [$t(119)=1.22$, $p=.225$, ns]. Therefore, the null hypothesis was not rejected. See Figure 8 below. There was no significant difference in the self-efficacy scores of males ($M=2.28$, $SD=.477$) and females ($M=2.14$, $SD=.55$). The 95% confidence interval for the difference in means was -.09 to .38. The η^2 index was .01, which indicated a small effect size. Therefore, gender did not play a significant role in scores on the self-efficacy test.

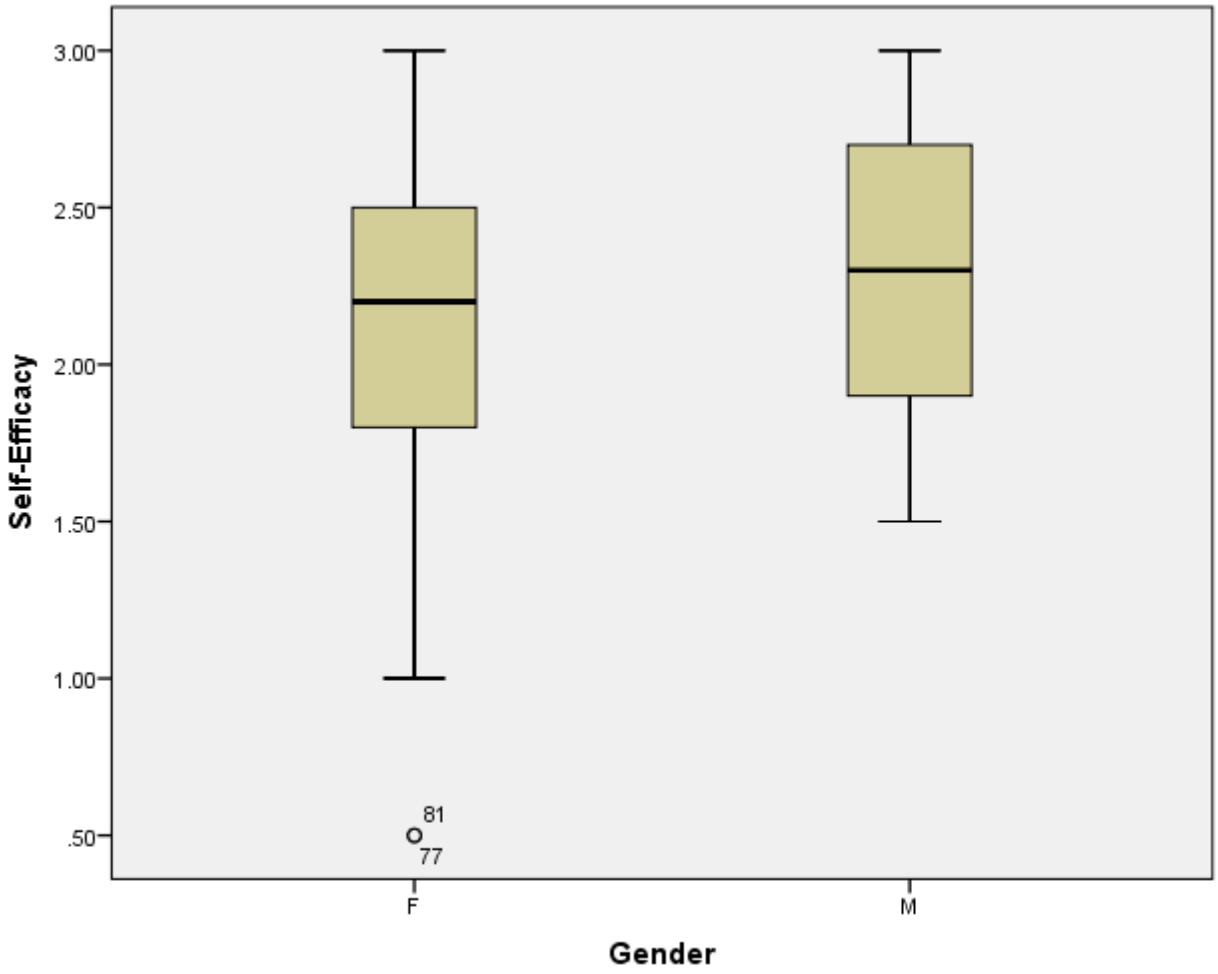


Figure 8. Comparison of the Self-Efficacy Scores of Males and Females in a Boxplot. Both 77 and 81 are both mild outliers in this figure. In order to analyze the differences in self-efficacy scores of males and females, the following items were examined on the survey: 1, 5, and 6.

Research Question 9

Research Question 9: Is there a significant difference between the classroom technology use of females and males?

Ho9. There is no significant difference between the classroom technology use of females and males.

An independent samples t-test was conducted to evaluate whether there was a significant difference between the classroom technology use of females and males. A survey instrument was used to measure the technology use of participants of both genders. The score on the technology use portion of the survey was the testing variable. The gender of the participants was the grouping variable. The test was not significant, $t(109)=-.18$, $p=.07$. The null hypothesis was not rejected. There was no significant difference in the mean technology scores of males ($M=2.15$, $SD=.49$) and females ($M=2.18$, $SD=.73$) in regard to classroom technology use. See Figure 9 below. The 95% confidence interval for the difference in means was -.36 to .30. The η^2 index was .00, which indicates a small effect size. There is no significant difference in the technology use of males and females in the classroom.

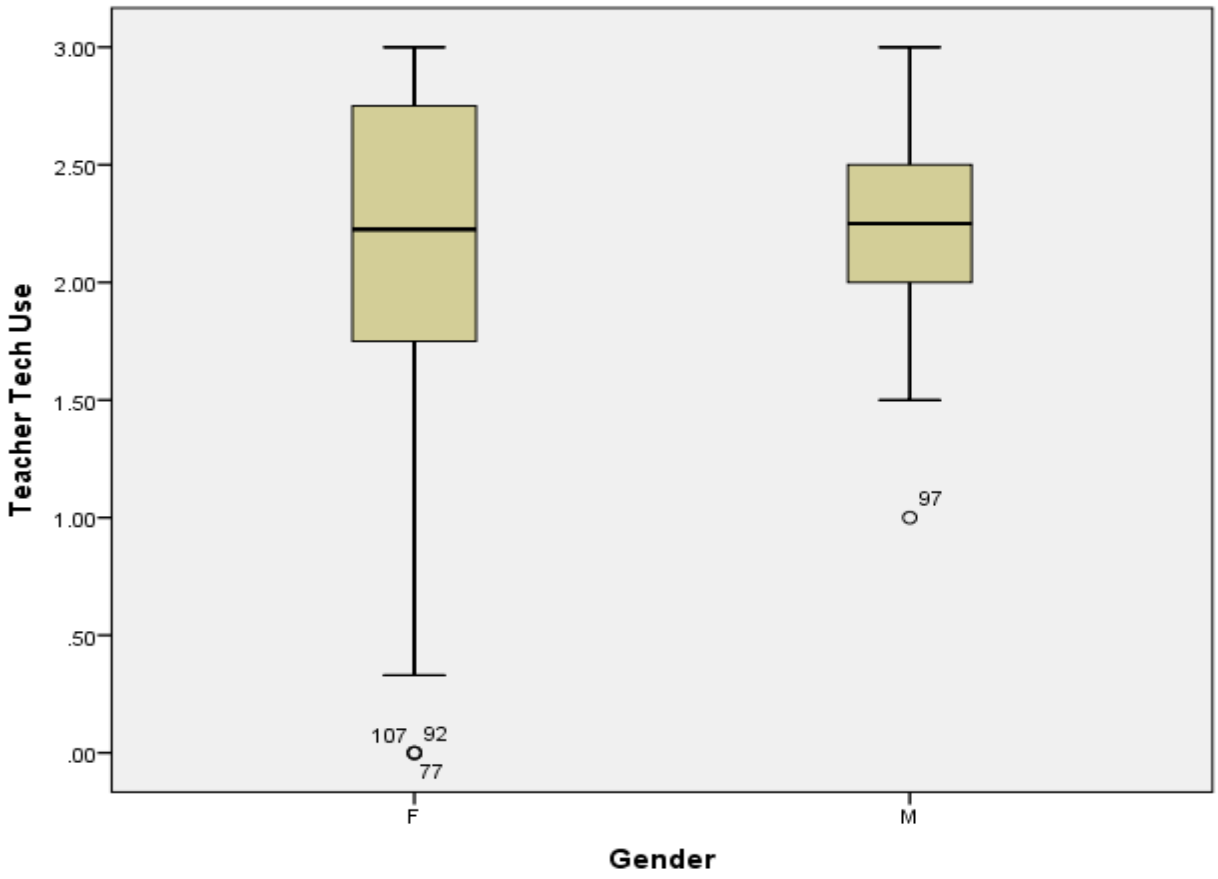


Figure 9. Comparison of Teacher Technology Use in the Classroom by Gender in a Boxplot. The numbers 77, 92, 97, and 107 are all mild outliers in this figure. In order to analyze the differences in technology use of males and females, the following items were examined from the survey: 1, 7, 8, and 9.

Summary

In this chapter, data from 124 classroom teachers in grades k-5 from two East Tennessee school districts were analyzed. There were nine research questions and nine null hypotheses. All data were collected through an online survey distributed via Survey Monkey at each school in the 2 districts.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE PRACTICE AND RESEARCH

This chapter contains a summary of the findings, conclusions, implications for practice, and recommendations for future research. The purpose of my study was to identify the combination of factors that pertain to the implementation of new technologies in the classroom. Specifically, the study analyzed the age of the teacher, years of teaching experience, quality of professional development, and teacher self-efficacy as defined by Bandura (1997) to examine the manner in which these factors relate to implementing new technologies in the classroom. This could be helpful for readers who will use the results as a resource when considering the introduction or revision of practices related to implementing new classroom technologies and factors that may influence success. The study was conducted using data from an online survey collected from two different school districts in East Tennessee.

Summary

The statistical analysis reported in this study was based on nine research questions and nine null hypotheses presented in Chapters 1 and 3. The first 7 research questions were analyzed using a correlation, while the remaining two research questions were analyzed using independent sample t-tests. An additional multiple choice question was analyzed regarding the quality of professional development received and descriptions of the findings were recorded. The total number of participants in the study was 124 teachers in grades K-5. The level of significance used for the statistical tests was .05. Findings indicated that the teacher age, years of teaching experience, teacher gender, and the hours a teacher spent in technology professional

development did not play a significant role in the self-efficacy of teachers. Findings also indicated that teacher age, years of teaching experience, teacher gender, and the hours spent in technology professional development did not play a significant role in the classroom technology use of teachers. Participants indicated that technology had at least somewhat impacted the way they teach in their classrooms. The gender of participants did not play a role in their self-efficacy scores or classroom technology use. Finally, findings indicated that the self-efficacy of a teacher is significantly positively related to classroom technology use of teachers.

Conclusions

The purpose of this study was to identify the combination of factors that pertain to the implementation of new technologies in the classroom. Specifically, the study was an analysis of the age of the teacher, years of teaching experience, quality of professional development, and teacher self-efficacy as defined by Bandura (1997) to examine the manner in which these factors relate to implementing new technologies in the classroom. The following conclusions were made based on the findings from the data in this study.

1. There was no significant correlation between teacher age and the self-efficacy of teachers. Teachers who were 20-30 years of age reported a mean self-efficacy score of 2.17. Teachers who were 31-40 years of age reported a mean self-efficacy score of 1.93, while teachers who were 41-50 years of age reported a mean self-efficacy score of 2.06. Those in the 51-60 years old group reported a mean self-efficacy score of 2.00 in contrast to those who were 61-70 years old who had a mean self-efficacy score of 2.39. In order to determine the relationship between teacher age and teacher self-efficacy scores, items 1, 5, and 6 were analyzed from the survey instrument.

These findings corroborated those of Bandura (1995) who concluded that age doesn't correlate with self-efficacy because people vary greatly in how efficacious they manage their lives. The research by Hoy and Tschannen-Moran (2007) also mirrored these findings by concluding that there was not a significant difference in potential sources of self-efficacy beliefs of teachers in regard to their age.

2. There was no significant correlation between years of teaching experience and the self-efficacy of teachers. The mean self-efficacy score for teachers with 0-3 years of teaching experience was 2.14. The mean self-efficacy score for teacher with 4-10 years of experience was 2.16, while the mean self-efficacy score for teachers with 11 years of experience or more was 2.27. Although the self-efficacy scores did increase a slight amount as the years of experience increased, they did not increase enough to be significant. In order to determine the relationship between years of teaching experience and self-efficacy, items 3, 5, and 6 were analyzed from the survey. These findings are echoed in the work of Bandura (1995) and Klassen and Chui (2010). Bandura (1995) suggested that self-efficacy may not be uniform from early to late adulthood. Therefore, self-efficacy beliefs may change over the course of a career due to life events and career challenges. Klassen and Chui (2010) stated that self-efficacy beliefs are not static and reflect a lifelong process of development that changes according to circumstances.
3. There was no significant correlation between the hours a teacher spends in professional development and the self-efficacy of teachers. The mean self-efficacy score of teachers who spent 0-4 hours in professional development was 2.21, while the mean self-efficacy score of teachers who spent 5-10 hours in professional

development was 2.30. Teachers who participated in 11-15 hours of professional development had a mean self-efficacy score of 2.15 and teachers who spent 16 or more hours in professional development had a mean score of 2.22. These results are of particular interest when compared with the research of Mizell (2008) who revealed that high quality professional development is an essential tool for increasing self-efficacy in teachers. When teachers know more and can apply that knowledge to real-world situations, their self-efficacy will increase (Mizell, 2008) Ross and Bruce (2007) corroborated those findings when they concluded that teachers who received quality professional development outperformed those in the control group in three areas of teacher self-efficacy. The findings of this study suggest that the hours spent in technology professional development do not play a role in self-efficacy; however, this study looked at the hours spent in technology professional development and does not reflect the quality of professional development received.

4. There was no significant correlation between teacher technology use and teacher age. The mean score for teacher technology use in the classroom was 1.80 for teachers who were 20-30 years of age. Teachers in the 31-40 year old range reported a mean teacher technology use score of 2.4, while teachers who were 41-50 years old reported a mean teacher technology use score of 2.15. Those teachers who were 51-60 years of age reported mean teacher technology use scores of 1.96 while those in the 61-70 year old range had mean technology use scores of 2.28 in the classroom. In order to analyze the relationship between teacher technology use and teacher age, items 2, 7, 8, and 9 were examined from the survey. These findings are supported by the research of Inan and Lowther (2010) who revealed that age has no significant

impact on technology integration in a study that analyzed the factors that affect technology integration in k-12 classrooms. Van der Kaay and Young (2010) concluded that older faculty members were no less likely to use technology in the classroom than younger faculty members in a study regarding age related differences in technology integration among community college faculty members. Finally, McConnell (2011) concluded that age did not significantly contribute to technology integration in a Texas private school.

5. There was no significant correlation between the classroom technology use of teachers and years of teaching experience. The mean score for teacher technology use in the classroom of those teachers with 0-3 years of experience was 2.48. Teachers with 4-10 years of experience yielded a teacher technology classroom use mean score of 2.04 and teachers with 11 or more years of experience reported mean scores of 2.25 for teacher technology use in the classroom. In order to analyze classroom technology use of teachers and years of teaching experience, items 3, 7, 8, and 9 were examined from the survey. These findings are supported by Gorder (2008) who concluded that no significant difference for technology integration and classroom technology use was found based on teaching experience. McConnell (2011) reported that teaching experience did not show a significant relationship to the level of technology integration in a study regarding the factors that affect technology integration in K-12 classrooms.
6. There was no significant correlation between teacher technology use and the hours spent in technology professional development. The mean classroom technology usage scores for teachers who participated in 0-4 hours of technology professional

development was 2.07. Teachers who participated in 5-10 hours of technology professional development had a mean classroom technology usage score of 2.24, while teachers who spent 11-15 hours in technology professional development had a mean classroom technology usage score of 2.19. Those teachers who reported spending more than 16 hours in technology professional development had a mean classroom technology usage score of 2.43. In order to analyze the relationship between teacher classroom technology use and hours spent in professional development, items 7, 8, 9, and 10 were examined from the survey. These findings are supported by Brinkerhoff (2006) who discovered that significant changes occurred among professional development program participants in self-assessed technology skills and computer self-efficacy skills, but little to no change occurred in technology integration beliefs of the teacher. Yurdakul et al. (2010) echoed these findings by concluding that while professional development programs were capable of increasing technology usage skills, they failed to induce substantial changes for technology integration.

7. There is a significant correlation between teacher self-efficacy scores and teacher technology use in the classroom. Teachers reported a mean self-efficacy score of 2.17 with a mean teacher technology usage score of 2.17. The correlation proved to be significant at a level of .043. In order to analyze the relationship between teacher self-efficacy scores and teacher technology use in classrooms, items 5, 6, 7, 8, and 9 were examined from the survey. These findings corroborate those of Ertmer and Ottenbreit-Leftwich (2010) who concluded that self-efficacy may be more important than skills and knowledge among teachers who implement technology in their

classrooms. McCormick and Ayers (2009) revealed the stronger teachers' beliefs in their capabilities to teach in new ways, the stronger their beliefs in their capabilities to use technology to do so. Finally, Evers et al. (2002) revealed that teachers who have high levels of self-efficacy are more willing to try new things and experiment more with educational innovations in the classroom.

8. There was not a significant difference found between the self-efficacy scores of males and females. There were 26 males who participated in the survey who reported mean self-efficacy scores of 2.28. There were 95 female participants in the survey who reported mean self-efficacy scores of 2.14. In order to analyze the relationship between self-efficacy scores and gender, items 1, 5, and 6 were examined from the survey. Britner and Pajares (2006) mirrored these findings by suggesting there are no sex differences in the strength of the relationship between the sources of self-efficacy in science, mathematics, or writing. Lee et al. (1991) agreed with these findings by concluding that there are no differences in teacher self-efficacy by gender at all.
9. There was no significant difference found between the classroom technology use of teachers and teacher gender. There were 21 males who participated in this portion of the survey and reported a mean classroom technology usage score of 2.15. There were 90 females who participated in this portion of the survey and reported a mean classroom technology usage score of 2.18. In order to analyze the relationship between classroom technology use of teachers and teacher gender, items 1, 7, 8, and 9 were examined from the survey. Findings echoed those of Teo et al. (2008) who concluded that gender was not a significant predictor of technology use in classrooms through a study that analyzed the technology integration of preservice teachers. Baker

et al. (2007) revealed that gender was not a significant variable on new technology implementation in a study of the effects of gender on new technology implementation in a developing country. Gorder (2008) agreed with the above findings by concluding that there was no significant difference in males and females when looking at technology implementation and use.

Recommendations for Practice

The findings and conclusions of this research have enabled me to identify the following recommendations for practice regarding the implementation of new classroom technologies:

1. Administrators should consider piloting programs for technology implementation in schools with a group of teachers who have high levels of self-efficacy in regard to classroom technology implementation. Teacher reluctance is cited as the main barrier to successful technology implementation (Durrant & Green, 2007). Therefore, it makes sense to choose teachers who are willing to try out a new technology in the classroom as participants in a pilot study. Evers et al. (2002) concluded that highly efficacious teachers are more prepared to experiment and implement new technology innovations.
2. Teachers who participate in a pilot program for technology implementation could become coaches for other teachers in the district upon completion of the pilot. Vicarious experiences are the second most powerful source of self-efficacy (Bandura, 1997). When teachers see their colleagues being successful at implementing new technologies in their classrooms, they will begin to gain self-

efficacy in their abilities to do so. The ability to have a coach on hand who can assist with any technical issues that a teacher may face when implementing a new technology will be a motivation to try out something new.

3. Additional training should be offered to teachers who experience low self-efficacy in specific content areas. Providing quality professional development opportunities for teachers on an individual basis when necessary will increase self-efficacy, thus making the teacher more effective at the skill. While the reasons for an educator's lack of self-efficacy may be complex, a major factor is lack of knowledge and skills to address the students' specific learning challenges (Mizell, 2008). Providing individual professional development opportunities will target the needs of the teacher directly and cut down on the cost of providing professional development to those teachers who do not need it in specific areas.
4.

Recommendations for Future Research

Technology is ever evolving. The survey instrument used in this study contained questions regarding teacher use of existing and current technology. However, these technologies will continue to change. Many will be become obsolete. Research must be updated on a regular basis to keep up with the technology use of teachers using existing and new technologies.

Those administrators who choose to pilot programs aimed at increasing technology implementation in the classroom should consider conducting research on the before and after effects of this implementation. Hopefully teacher technology implementation in the classroom will increase as a result of the coaching efforts that come from a pilot program.

More research is needed on the quality of professional development being delivered to teachers regarding technology implementation. Teachers reported attending training and professional development opportunities that focused on technology implementation, yet that training did not translate to significant levels of implementation of technology in the classroom. This may be due to the quality of professional development that is available.

The adoption of Common Core Standards has created a push for technology in the classroom, but the United States has still not achieved high levels of effective technology integration (Mueller et al., 2008). Creating programs that promote technology integration in the classroom and giving teachers the support, training, and professional development opportunities they need could be a step in the right direction toward successful technology integration.

REFERENCES

Allinder, R. (1994). The relationship between efficacy and the instructional practices of special education teachers and consultants. *Teacher Education and Special Education, 17(2),* 86-95.

Anderson, L. (2011, September). Teacher diversity: Do male and female teachers have different self-efficacy and job satisfaction? *EGPA Conference 2011.* Bucharest, Romania.

Anderson, R., Greene, M., & Loewen, P. (1988). Relationships among teachers' and students' thinking skills, sense of efficacy, and student achievement. *Alberta Journal of Educational Research, 34,* 148-165.

Ashton, P., & Webb, R. (1986). *Making a difference: Teachers' sense of efficacy and student achievement.* New York, NY: Longman.

Baek, Y., Jong, J., & Kim, B. (2008). What makes teachers use technology in the classroom? Exploring the factors affecting facilitation of technology with a Korean sample. *Computers and Education, 50* , 224-234.

Baker, E., Al-Gahtani, S., & Hubona, G. (2007). The effects of gender and age on new technology implementation in a developing country: Testing the theory of planned behavior. *Information and Technology, 20,* 352-375.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1994). Self-efficacy. In V.S. Ramachaudran (ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press.

Bandura, A. (1995). *Self-efficacy in changing societies.* New York, NY: Cambridge University Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York, NY: W.H. Freeman.

Bebetsos, E., & Antoniou, P. (2009). Gender differences on attitudes, computer use, and physical activity among Greek university students. *The Turkish Online Journal of Educational Technology, 8*(2), 63-68.

Berman, P., & McLaughlin, M. (1977). Federal programs supporting educational change.

Volume III, Volume IV: Factors affecting implementation and continuation. Santa Monica, CA: Rand.

Blackburn, J., & Robinson, J. (2008). Assessing teacher self-efficacy and job satisfaction of early career agriculture teachers in Kentucky. *Journal of Agricultural Education, 49*(3), 1-11.

Bracey, G. (2011). The Sage handbook for research in education. In C. Conrad & R. Serlin (Eds.), *Getting the word out: Challenges and opportunities in explaining educational research to the world* (pp.381-396). Thousand Oaks, CA: Sage.

Bray-Clark, N., & Bates, R. (2003). Self-efficacy beliefs and teacher effectiveness: Implications for professional development. *The Professional Educator, 26(1),* 13-22.

Brinkerhoff, J. (2006). Effects of a long-duration, professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. *International Society for Technology in Education, 39*(1), 22-43.

Britner, S., & Pajares, F. (2006). Sources of science self-efficacy beliefs of middle schools students. *Journal for Research in Science Teaching, 43*, 485-499.

Broughman, S. (2006). Teacher professional development in 1999-2000. Washington, DC: National Center for Education Statistics.

Brown, G. (1994). Teachers' conceptions of assessment: Implications for policy and professional development. *Assessment in Education: Principles, Policy, and Practice, 11*, 301-318.

Bushweller, K. (2005, May). Electronic transfer: Moving technology dollars in new directions. *Education Week, 24*, 11.

Cantrell, S., & Callaway, P. (2008). High and low implementers of content literacy instruction: Portraits of teacher efficacy. *Teaching and Teacher Education, 24*, 1739-1750.

CDW-G (2006). *Teachers Talk Tech* reveals technology access and professional development are driving improved teacher and student performances. Retrieved May 2012 from newsroom.cdwg.com/features/TTTCompleteResults.pdf

Clifford, P., Friesen, S., & Lock, J. (2004). Coming to teaching in the 21st century: A research study conducted by the Galileo Educational Network for Alberta Learning. Retrieved April 2012 from: http://www.galileo.org/research/publications/ctt.pdf

Corcoran, T., Shields, P., & Zucker, A. (1998, March). *Evaluation of NSF's statewide systemic initiatives (SSI) program: The SSIs and professional development for teachers.* Menlo Park, CA: SRI.

Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage.

Dee, T., & Jacob, B. (2010). The impact of No Child Left Behind on students, teachers, and schools. *Brookings Papers on Economic Activity, 41,* 149-207.

Dewey, J. (1938). *Experience and education.* New York, NY: Simon and Schuster.

Durrant, C., & Green, B. (2000). Literacy and new technologies in school education: Meeting the L(IT)eracy challenge? *Australian Journal of Language and Literacy, 23*(2), 89-105

Eberle, W. (2011). *Teacher self-efficacy and student achievement as measured by North Carolina reading and math end-of-grade tests* (Doctoral dissertation). Available from Proquest Dissertations and Thesis database. (UMI No. 3462062).

Epps, R., Foor, R., & Cano, J. (2010). Keepers, stayers, leavers, and lovers: Are there teacher self-efficacy differences between novice and experienced teachers? Manuscript submitted for publication.

Ertmer, P., & Ottenbreit-Leftwich, A. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education, 42,* 255-284.

Evers, W., Brouwers, A., & Tomic, W. (2002). Burnout and self-efficacy: A study on teachers' beliefs when implementing an innovative educational system in the Netherlands. *British Journal of Educational Psychology, 72,* 227-243.

Fuchs, L., Fuchs, D., & Bishop, N. (1992). Instructional adaptations for students at risk. *Journal of Educational Research, 86,* 70-84.

Garet, M., Porter, A., Desimone, L, Briman, B., & Yoon, K. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38,* 915-945.

Ghanizadeh, A., & Moafian, F. (2009). The relationship between Iranian EFL teacher's sense of self-efficacy and their pedagogical success in language institutes. *An International Journal of Educational Technology and Applied Linguistics, 37,* 708-718.

Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology, 76*(2), 569-582.

Giordano, V. (2008). A professional development model top promote Internet integration into p-12 teachers' practice: A mixed methods study. *Computers in the Schools, 24,* 111-123.

Glazer, E., Hannafin, M., Polly, D., & Rich, P. (2009). Factors and interactions influencing technology integration in situated professional development in an elementary school. *Computers in the Schoools, 26*(1), 21-39.

Gorder, L. (2008). A study of teacher perceptions of instructional technology integration in the classroom. *Delta Pi Epsilon Journal*, *50*(2), 63-76.

Gorozidis G., & Papaioannou, A. (2011). Teachers' self-efficacy, achievement goals, attitudes and intentions to implement the new Greek physical education curriculum. *European Physical Education Review, 17*, 231-253.

Groth, L, Dunlap, K., & Kidd, J. (2007). Becoming technologically literate through technology integration in PK-12 preservice literacy courses: Three case studies. *Reading Research and Instruction, 46*, 363-386.

Gu, Q., & Day, C. (2007). Teacher resilience: A necessary condition for effectiveness. *Teaching and Teacher Education, 23*, 1302-1316.

Hartfield, K. (2011). *Perceived levels of teacher self-efficacy among secondary Arizona agricultural education teachers.* (Doctoral Disssertation, The University of Arizona).

Henry, A. (2008). *The relationship of age, gender, and personality style with the level of technology implementation at the university level.* (Doctoral Dissertation). Available from Proquest Dissertation and Thesis Database. (UMI: 3324558).

Hermans, R. Tondeur, J., van Braak, J., & Valcke, M. (2008). The impact of primary school on teachers' educational beliefs on the classroom use of computers. *Computers and Education, 51*, 1499-1509.

Hernandez-Ramos, P. (2005). If not here, where? Understanding the teacher's use of technology in Silicon Valley Schools. *Journal of Research on Technology in Education*, *38*(1), 39-64.

Hew, K., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, *55*, 223-252.

Hicks, S. (2012). *Self-efficacy and classroom management: A correlational study regarding the factors that influence classroom management* (Doctoral dissertation, Liberty University, Lynchburg, VA). Retrieved March 2012 from: http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1598&context=doctoral

Hill, H. (2009). Fixing teacher professional development. *Phil Delta Kappan, 90*(7), 470-476.

Hoy, A., & Tschannen-Moran, M.(2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teacher and Teacher Education, 23*, 944-956.

Huberman, M. (1988). Teacher careers and school improvement. *Journal of Curriculum Studies, 20*, 119-132.

Inan, F., & Lowther, D. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development, 58*, 137-154.

International Society for Technology in Education (2003). *Use of NETS by State.* Retrieved May 2012 from: www.k12hsn.org/.../Technology/ISTE_policy_brief_student_achievement.pdf.

Jamieson-Proctor, R., Burnett, P., Finger, G., & Watson, G. (2006). ICT integration and teachers' confidence in using ICT for teaching and learning in Queensland state schools. *Australasian Journal of Educational Technology, 22*, 511.

Jenks, C. (2004). The effects of age, sex, and language proficiency on the self-efficacy of English language learners. *Annual Review of Education, Communication, and Language Sciences, 1*, 1-6.

Joet, G., Usher, E., & Bressoux, P. (2011). Source of self-efficacy: An investigation of elementary school students in France. *Journal of Educational Psychology, 103*, 649-663.

Joseph, K. (2009). The effects of technology in the classroom on teacher self-efficacy for technology use. Retrieved April 2012 from: http://gunston.gmu.edu/kjoseph/portfolio/documents/EDRS811_Teacher-Self-Efficacy-for-Technology-Use.pdf

Kanaya, T., Light, D., & Culp, K. (2005). Factors influencing outcomes from a technology focused professional development program. *Journal of Research on Technology in Education, 37*, 313-329.

Karsten, R., & Roth, R. (1998). The relationship of computer experience and computer self-efficacy to performance. *Journal of Research on Computing in Education, 31*(1), 14.

Kay, R. (2006). Evaluating strategies used to incorporate technology into preservice education: A review of the literature. *Journal of Research on Technology in Education, 38*, 383-408.

Klassen, R., & Chiu, M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology, 102*, 741-756.

Klein, J.D. (2010). When you can't bring your classroom to the world, bring the world into your classroom. *Youth Media Reporter*, 7, 486-488.

Knobloch, N. (2006). Exploring relationships of teachers' sense of efficacy in two student teaching programs. *Journal of Agricultural Education*, *47*(2), 36-47.

Koh, J., & Frick, T. (2009). Instructor and student classroom interactions during technology skills instruction for facilitating preservice teachers' computer self-efficacy. *Journal of Educational Computing Research, 40*, 221-228.

Lai, K. (2008). ICT supporting the learning process: The premise, reality, and promise. In J. Voogt & G. Knezek (Eds), *International handbooks of information technology in primary and secondary education* (pp. 215-230). New York, NY: Springer.

Lau, B., & Sim, C. (2008). Exploring the extent of ICT adoption among secondary school teachers in Malaysia. *International Journal of Computing and IT Research*, *2*(2), 19-36.

Lavonen, J., Juuti, K, Aksela, M., & Meisalo, V. (2006). A professional development project for improving the use of information and communications technologies in science teaching. *Technology, Pedagogy, and Education, 15*, 159-174.

Lawless, K., & Pellegrino, J. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, 77, 575-614.

Learning Forward. (2010). Learning Forward standards for staff development. Retrieved October 2012 from http://www.learningforward.org/standards.

Lee, V., Dedrick, R., & Smith, J. (1991). The effect of social organization on schools teachers' efficacy and satisfaction. *Sociology of Education, 64*, 190-208.

Lemke, C., & Fadel, C. (2006). *Technology in schools: What the research says.* Culver City, CA: Metiri Group for Cisco Systems.

Lent, R., Lopez, F., Brown, S., & Gore, P. (1996). Latent structure of the sources of mathematics self-efficacy. *Journal of Vocational Behavior, 44*, 292-308.

Levin, T., & Wadmany, R. (2008). Teachers' beliefs and practices in technology-based classrooms: A developmental view. *Journal of Research on Technology in Education, 39*, 157-181.

Martin, W. Strother, S., Beglau, M., Bates, L., Reitzes, T., & Culp, K. (2010). Connecting instructional technology professional development to teacher and student outcomes. *Journal of Research on Technology in Education, 43*(1), 55-76.

Mathis, W. (2010). *The "Common Core" Standards Initiative: An effective reform tool?* Boulder

and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved November 2012 from: http://epicpolicy.org/publication/common-core-standards.

McAdoo, S. (2005). *An assessment of a teacher laptop program in a southwestern urban school district* (Unpublished dissertation). University of Oklahoma, Norman.

McConnell, B. (2011). *Factors affecting teachers' level of technology implementation in a Texas private school* (Doctoral Dissertation). Available from Proquest Dissertations and Thesis database. (UMI No. 3460960).

McCormick, J., & Ayers, P. (2009). Teacher self-efficacy and occupational stress: A major Australian curriculum reform revisited. *Journal of Educational Administration, 47*(4), 463-476.

McMillan, J., & Schumacher, S. (2006). *Research in education: Evidence-based Inquiry.* Boston, MA: Allyn and Bacon.

Means, B., Padilla, C., Debarger, A., & Bakia, M. (2009). *Implementing data-informed decision making in schools-Teacher access, supports, and use.* Report prepared for U.S. Department of Education, Office of Planning, Evaluation, and Policy Development. Prepared by SRI International, Menlo Park, CA.

Miranda, H. (2007). Predictors of technology use for elementary school teachers in Massachusetts: A multilevel SEM approach. Dissertation Abstract International. Section A. *Humanities and Social Sciences, 68*, 1895.

Miranda, H., & Russell, M. (2011). Predictors of teacher-directed student use of technology in elementary classrooms: A multilevel SEM approach using data from the USEIT study. *Journal of Research on Technology Education, 43*, 301-323.

Mizell, H. (2008). Self-efficacy and professional development. *Proceedings of the annual meeting of the 12 Under 12 Network,* National Harbor, MD.

Mizell, H. (2010). *Why professional development matters.* Oxford, OH: Learning Forward.

Moersch, C., & Ondracek, L. (2005). *LoTi mentor certification manuel.* Hillsdale, NJ: Learning Quest.

Mollette, M., Townshend, M., Townshend, T.,& Cohen, K. (2009, November). Measuring the effects of collaboration and professional development on the technology integration and student achievement in k-12 classrooms. Paper presented at the Annual meeting of the American Evaluation Association, Orlando, FL.

Morrison, J., & Estes, J. (2007). Using scientists and real-world scenarios in professional

development for middle school science teachers. *Journal of Science Teacher Education, 18*, 165-184.

Mueller, J., Wood, E., Willougby, T., Ross, C., & Specht, J. (2008). Identifying discriminating variables between teachers who fully integrate computers and teachers with limited integration. *Computers and Education, 51*, 1523-1537.

Muijs, D., & Reynolds, D. (2002). Teachers' beliefs and behaviors: What really matters? *Journal of Classroom Instruction, 37*(2), 3-15.

National Center for Education Statistics (2008). *Educational technology in the U.S. public schools.* Retrieved April 2012 from: http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010034

National Education Association (2008). *No Child Left Behind: Issue overview*. Retrieved April 2012 from: www.americanprogress.org/wp-content/.../ses_implementation.pdf

National Governors Association Center for Best Practices, Council of Chief State School Officers (2010). *Common Core State Standards.* National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C. Retrieved October 2012 from: http://www.corestandards.org/

NETS for Students 2007 Standards. (2007). Retrieved October 2012from: http://www.iste.org/standards/nets-for-students/nets-student-standards-2007

Oppenheimer, D. (2009). Kennedy, King, Shuttlesworth, and Walker: The events leading to the introduction of the Civil Rights Act of 1964. *University of San Francisco Law Review, 29*, 645-679

Overbaugh, R., & Lu, R. (2008). The impact of a NCLB-EETT funded professional development program on teacher self-efficacy and resultant implementation. *Journal of Research on Technology in Education, 41*(1), 43-61.

Pajares, F. (2002). *Overview of social cognitive theory and self-efficacy.* Retrieved March 2012 from: http://www.uky.edu/~eushe2/Pajares/eff.html.

Palmer, D., Stough, L., Burdenski, T., & Gonzales, M. (2005). Identifying teacher expertise: An examination of researchers' decision making. *Educational Psychologist*, *40*(1), 13-25.

Pankow, L. (1995). Comparison of locus of control among nursing home residents with visual impairment and normal sight. *Journal of the American Optometric Association, 66*(10), 613-619.

Paraskeva, F., Bouta, H., & Papagianni, A. (2007). Individual characteristics and computer self-

efficacy in secondary education teachers to integrate technology in educational practice. *Computers and Education, 50*(3), 1084-1091.

Park, S., & Ertmer, P. (2008). Impact of problem-based learning (PBL) on teachers' beliefs regarding technology use. *British Journal of Research on Technology in Education, 39*, 631-643.

Peck, C., Cuban, L., & Kirkpatrick, H. (2002). Techno-promoter dreams, student realities. *Phi Delta Kappan, 83*, 472-480.

Penuel, W. (2006). Implementation and effects of one-to-one computing initiatives: A research synthesis. *Journal of Research on Technology in Education, 38*, 329-348.

Porter, A., Polikoff, M., & Smithson, J. (2009). Is there a defacto national intended curriculum? Evidence from state content standards. *Educational Evaluation and Policy Analysis, 31*, 238-268.

Porter, A., McMaken, J., Hwang, J., & Yang, R. (2011). Common Core Standards: The new intended U.S. curriculum. *Educational Researcher, 40*, 103-116.

Powell-Moman, A., & Brown-Schild, V. (2011). The influence of a two-year professional development instititute on teacher self-efficacy and use of inquiry-based instruction. *The Science Educator, 20(2)*, 47-53.

Project Tomorrow. (2008). *21st century learners deserve a 21st century education.* Selected National Findings of the Speak Up 2007 Survey. Retrieved April 2012 from: http://www.tomorrow.org/speakup/speakup_congress_2007.html

Professional Development (2011, June 29). *Education Week.* Retrieved October 2012 from: http://www.edweek.org/ew/issues/professional-development/

Raudenbush, S., Rowan, B., & Cheong, Y. (1992). Contextual effects on the self-perceived efficacy of high school teachers. *Sociology of Education, 65*, 150-167.

Rimm-Kaufman, E., & Sawyer, B. (2004). Primary-grade teachers' self-efficacy beliefs, attitudes toward teaching, and discipline and teaching practice priorities in relation to the responsive classroom approach. *Elementary School Journal, 104*, 321-341.

Robardey, C., Allard, D., & Brown, D. (1994). An assessment of the effectiveness of full option science system training for third through sixth-grade teachers. *Journal of Elementary Science Education, 6(1)*, 17-29.

Robinson, J., & Shane, C. (2012) Assessing the teacher self-efficacy of agriculture instructors and their early career employment status: A comparison of certification types. *Journal of Agricultural Education, 53*,150.

Rogers, E. (1995). *Diffusion of innovations.* Glencoe, NY: Free Press.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological monographs: General and applied*, *80*(1), 1.

Roscorla, T. (2010, June). Technology permeates Common Core Standards. *Converge Magazine.*

Ross, J. (1992). Teacher efficacy and the effects of coaching on student achievement. *Canadian Journal of Education*, *17*(1), 51-65.

Ross, J., & Bruce, C. (2007). Professional development effects on teacher efficacy: Results of a randomized field test. *Journal of Educational Research, 101(1),* 50-60.

Ross, J., Cousins, J., & Gadalla, T. (1996). Within-teacher predictors of teacher efficacy. *Teaching and Teacher Education*, *12*, 385-400.

Russell, M., O'Dwyer, L., Bebell, D., & Tao, W. (2007). How teachers' uses of technology vary by tenure and longevity. *Journal of Educational Computing Research, 37*, 393-417.

Sanders, B. (2010). *School leaders and the challenge of the Elementary and Secondary Education Act, 1960-1968.* Retrieved March 2012 from: http://hdl.handle.net/2027.42/77841.

Sang, G., Valcke, M, van Braak, J., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers and Education, 54*, 103-112.

Schunk, D., & Meece, J. (2006). Self-efficacy development in adolescence. In F. Pajares, & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 71-96). Greenwich, CT: Information Age.

Schwarzer, R., Schmitz, G., & Daytner, G. (1999). *The teacher self-efficacy scale.[Online Publication]*. Retrieved April 2012 from: http://userpage.fu-berlin.de/~gesund/skalen/Language_Selection/Turkish/Collective_Teacher_Self-Effica/hauptteil_collective_teacher_self-effica.htm

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation Analysis. *Applied Psychology: An International Review, 57*, 152-171.

Shriver, M., Clark, D., Nail, M., Schlee, B., & Libler, R. (2010). Social studies instruction: Changing teacher confidence in classrooms enhanced by technology. *The Social Studies, 101*(1), 37-45.

Siebert, M. (2006). *An examination of students' perceptions of goal orientation in the classroom and teachers' beliefs about intelligence and teacher efficacy.* (Doctoral dissertation, Kansas State University).

Skaalvik, E., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. *Teacher and Teacher Education, 26*, 1059-1069.

Smarkola, C. (2007). Efficacy of a planned behavior model: Beliefs that contribute to computer usage intentions of student teachers and experienced teachers. *Computers in Human Behavior*, 24, 1196-1215.

Smits, C., & Bosscher, R.(1998). Predictors of self-efficacy and mastery. In D.J.H Deeg, A.T.F. Beekman, D.M.W. Kriegsman, M., & Westendorp-de Seriere (Eds.), *Autonomy and well-being in the aging population.* Report from the Longitudinal Aging Study Amsterdam 1992-1996 (pp. 105-114). Amsterdam, Netherlands: VU University.

Strauss, V. (2012). Eight problems with Common Core Standards. *The Washington Post*. Retrieved October 2012 from: http://www.washingtonpost.com/blogs/answer-sheet/post/eight-problems-with-common-core-standards/2012/08/21/821b300a-e4e7-11e1-8f62-58260e3940a0_blog.html

Strauss, W. (2005). Talking about their generations: Making sense of a school environment made up of Gen-Xers and Millenials. *School Administrator*, 62(8), 10.

Swan, B., Wolf, K., and Cano, J. (2011). Changes in teacher self-efficacy from the student teacher experience through the third year of teaching. *Journal of Agricultural Education, 52*, 128-139.

Teo, T., Chai, C. S., Hung, D., & Lee, C. B. (2008). Beliefs about teaching and uses of technology among pre-service teachers. *Asia-Pacific Journal of Teacher Education*, *36*, 163-174.

Tripp, L., & Herr-Stephenson, R. (2009). Making access meaningful: Latino young people using digital media at home and at school. *Journal of Computer-Mediated Communication, 14*, 1190-1207.

Tsai, C., Lin, S., & Tsai, M. (2001). Developing an Internet attitude scale for high school students. *Computers & Education*, *37*(1), 41-51.

Tschannen-Moran, M., Hoy, A., & Hoy, W. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research, 68*, 202-248.

Tschannen-Moran, M., & Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and teacher education, 17*, 783-805.

Tschannen-Moran, M., & Hoy, A. (2002, April). *The influence of resources and support on teachers' efficacy beliefs.* A paper presented at the annual meeting of the American Educational Research Association, Session 13:82 on April 2, 2002. New Orleans, LA.

Tschannen-Moran, M., & Hoy, A. W. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and teacher Education, 23*, 944-956.

U.S. Department of Education. (1999). Education and Title IV. Retrieved April 2012 from: http://www2.ed.gov/about/offices/list/ocr/docs/hq43e4.html.

U.S. Department of Education. (2003). *Federal funding for educational technology and how it is used in the classrooms: A summary of findings from the Integrated Studies of Educational Technology.* Office of the Under Secretary, Policy and Program Studies Service: Washington D.C. Retrieved March 2012 from: www.ed.gov/rschstat/eval/tech/iset/summary2003.pdf

U. S. Department of Education. (2009). President Obama, U.S. Secretary of Education Duncan Announce National Competition to Advance School Reform. Retrieved April 2012 from: http://www2.ed.gov/news/pressreleases/2009/07/07242009.html

Usher, E., & Pajares, F. (2008). Sources of self-efficacy: Critical review of the literature and future directions. *Review of Educational Research, 78*, 751-796.

Valcke, M., Rots, I., Verbeke, M., & van Braak, J. (2007). ICT teacher training: Evaluation of the curriculum and training approach in Flanders. *Teacher & Teacher Education, 23*, 795-808.

Van derKaay, C., & Young, W. (2012). Age-related differences in technology usage among community college faculty. *Community College Journal of Research and Practice, 36*, 570-579

Voogt, J., Almekinders, M., van der Akker, J., & Moonen, B. (2005). A 'blended' in-service arrangement for classroom technology integration: Impacts on teachers and students. *Computers in Human Behavior, 21*, 523-539.

Voogt, J. (2008). IT and the curriculum processes: Dilemmas and challenges. In J. Voogt, & G. Knezek (Eds), *International handbook of information technology in primary and secondary education* (pp. 117-132). New York, NY: Springer.

Voris, B. (2011). *Teacher efficacy, job satisfaction, and alternative certification in early career special education teachers.* (Doctoral Dissertation). Retrieved April 2012 from the University of Kentucky Doctoral Dissertations at http://uknowledge.uky.edu/gradschool_diss/159.

Whittington, M., McConnell, E., & Knobloch, N.(2006). Teacher efficacy of novice teachers in

agricultural education in Ohio at the end of the school year. *Journal of Agricultural Education*, *47*(4), 26-38.

Wissehr, C., Concannon, J., & Barrow, L. (2011). Looking back at the Sputnik era and its impact on science education. *School Science and Mathematics, 111,* 368-375.

Wolters, C., & Daugherty, S. G. (2007). Goal structures and teachers' sense of efficacy: Their relation and association to teaching experience and academic level. *Journal of Educational Psychology*, *99,* 181.

Woolfolk Hoy, A., & Burke-Spero, R. (2005). Changes in teacher efficacy during the early years of teaching: A Comparison of four measures. *Teaching and Teacher Education, 21,* 343-356.

Woolfolk, A., Rosoff, B., & Hoy, W. (1990). Teachers' sense of efficacy and their beliefs about managing students. *Teacher and Teacher Education, 6,* 137-148.

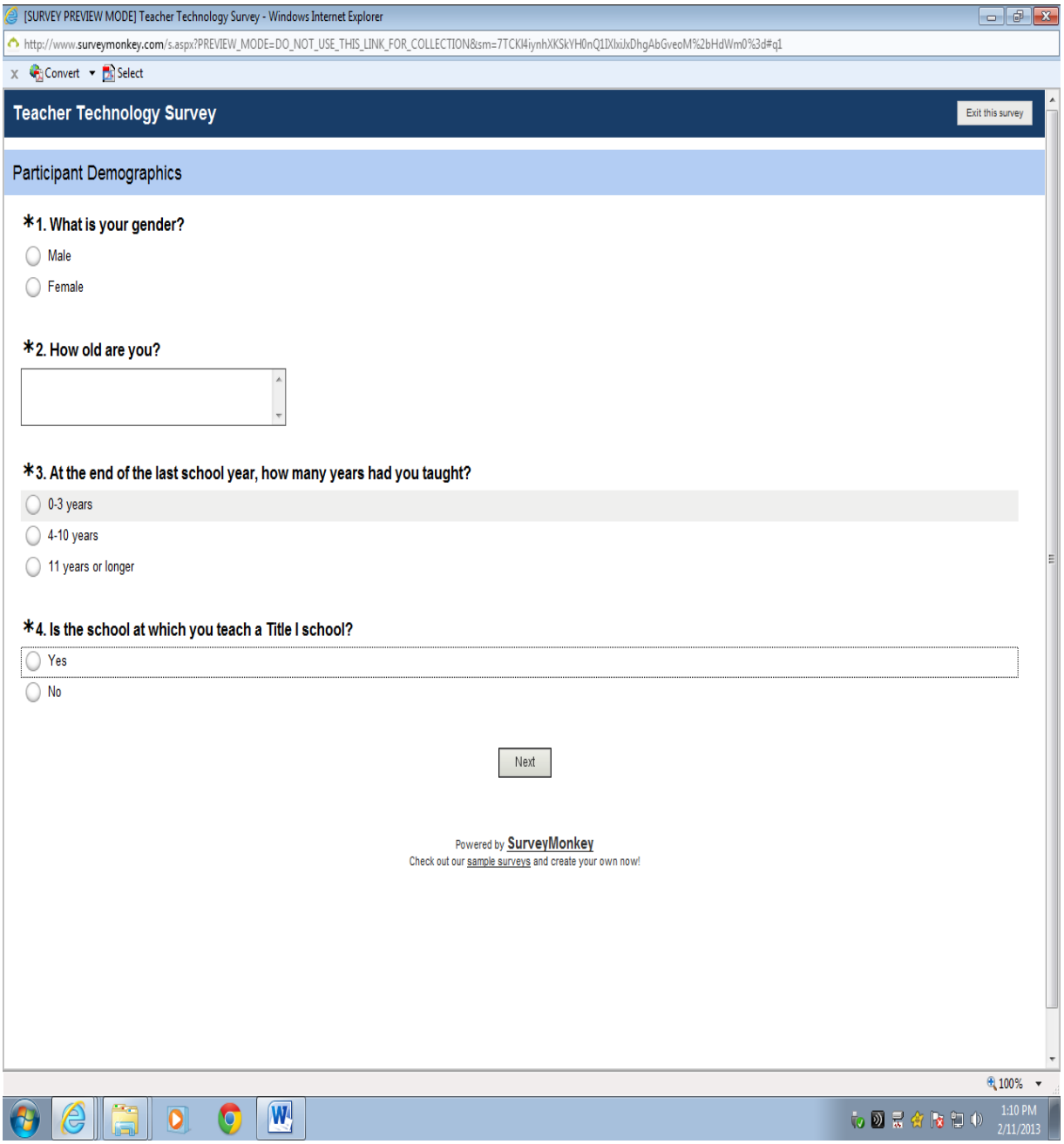
Wright, V. (2010). Professional development and the master technology teacher: The evolution of one partnership. *Education, 131,* 139-146.

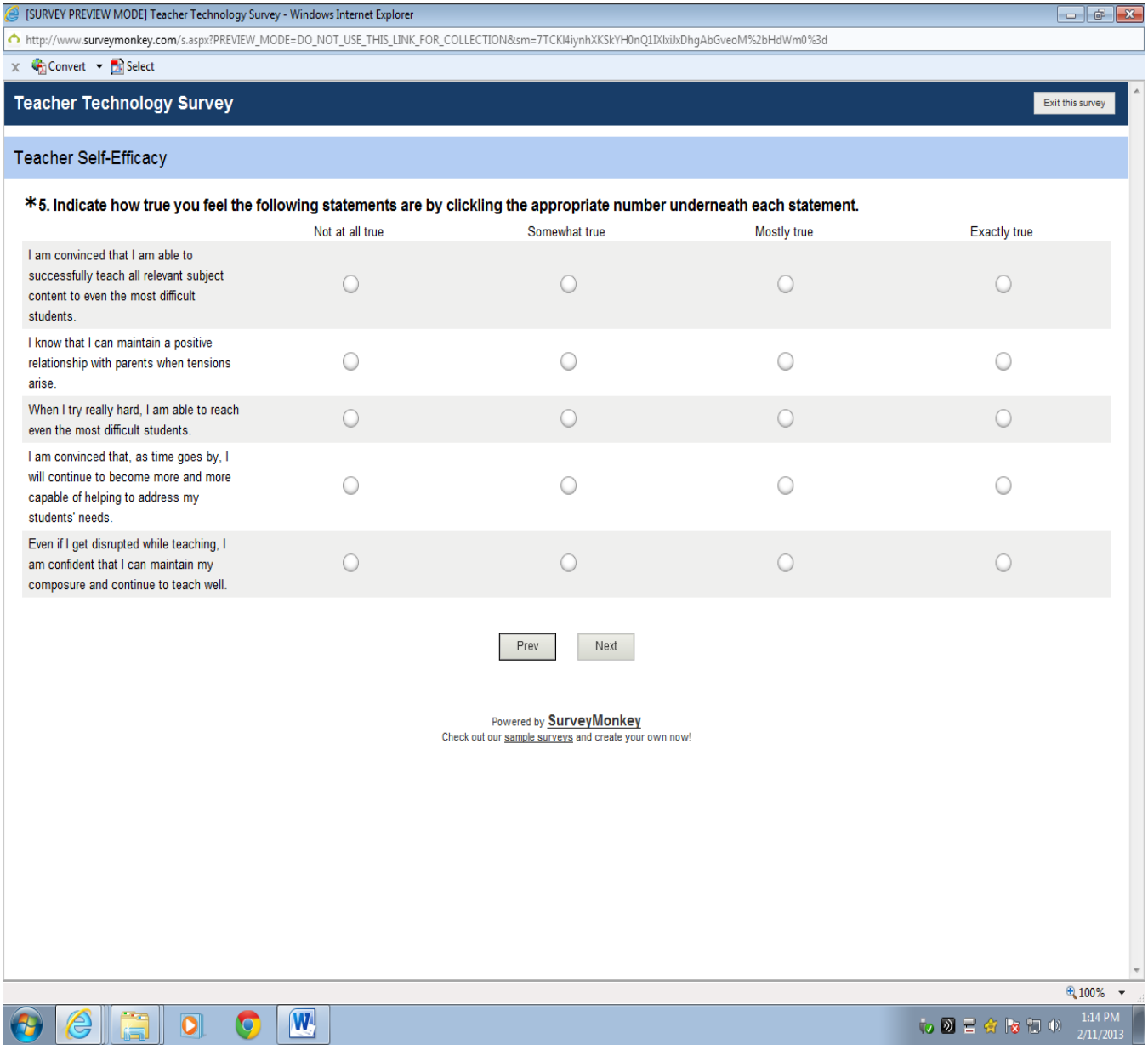
Yurdakul, B., Yildiz, D, Cakar, E., & Uslu, O. (2010, July). *Evaluation of professional development program practices implemented toward web-based content development.* Paper presented at the 13th International Conference ICT in education of the Balkan countries, Varna, Bulgaria.

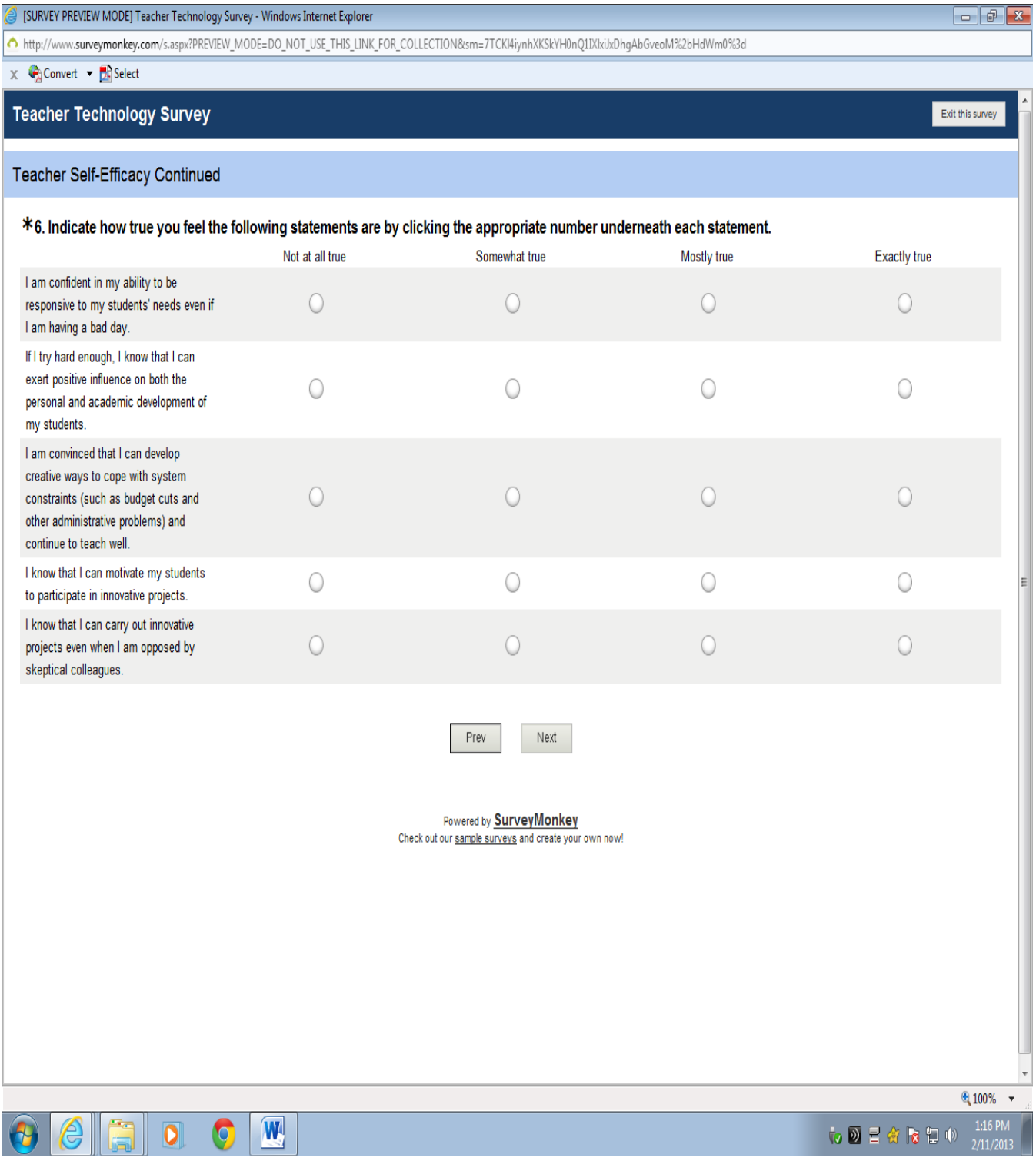
Zhao, Y. (2012, June 17). Common sense vs. Common Core: How to minimize the damages of the Common Core. Retrieved October 2012 from: http://zhaolearning.com.

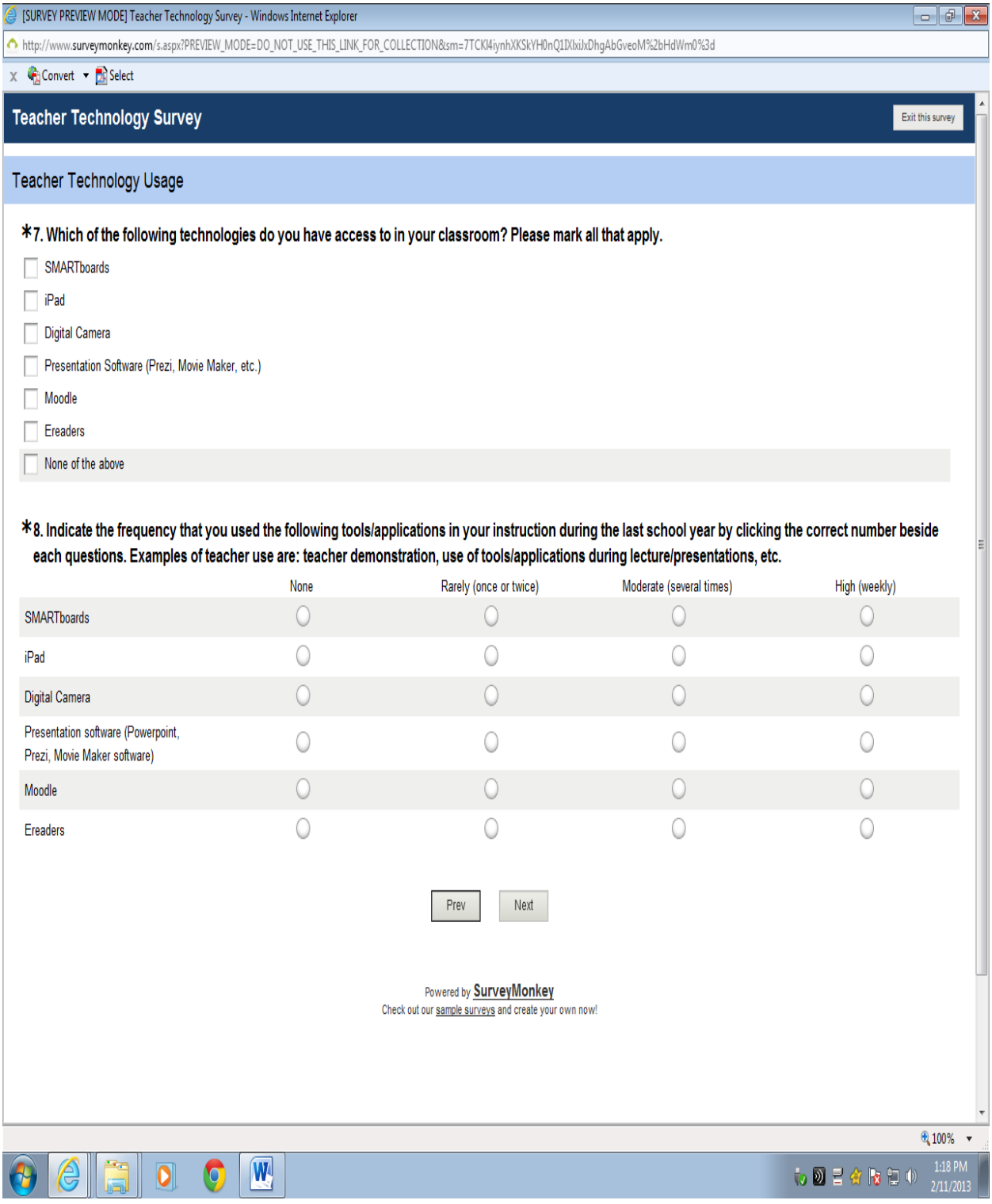
APPENDIXES

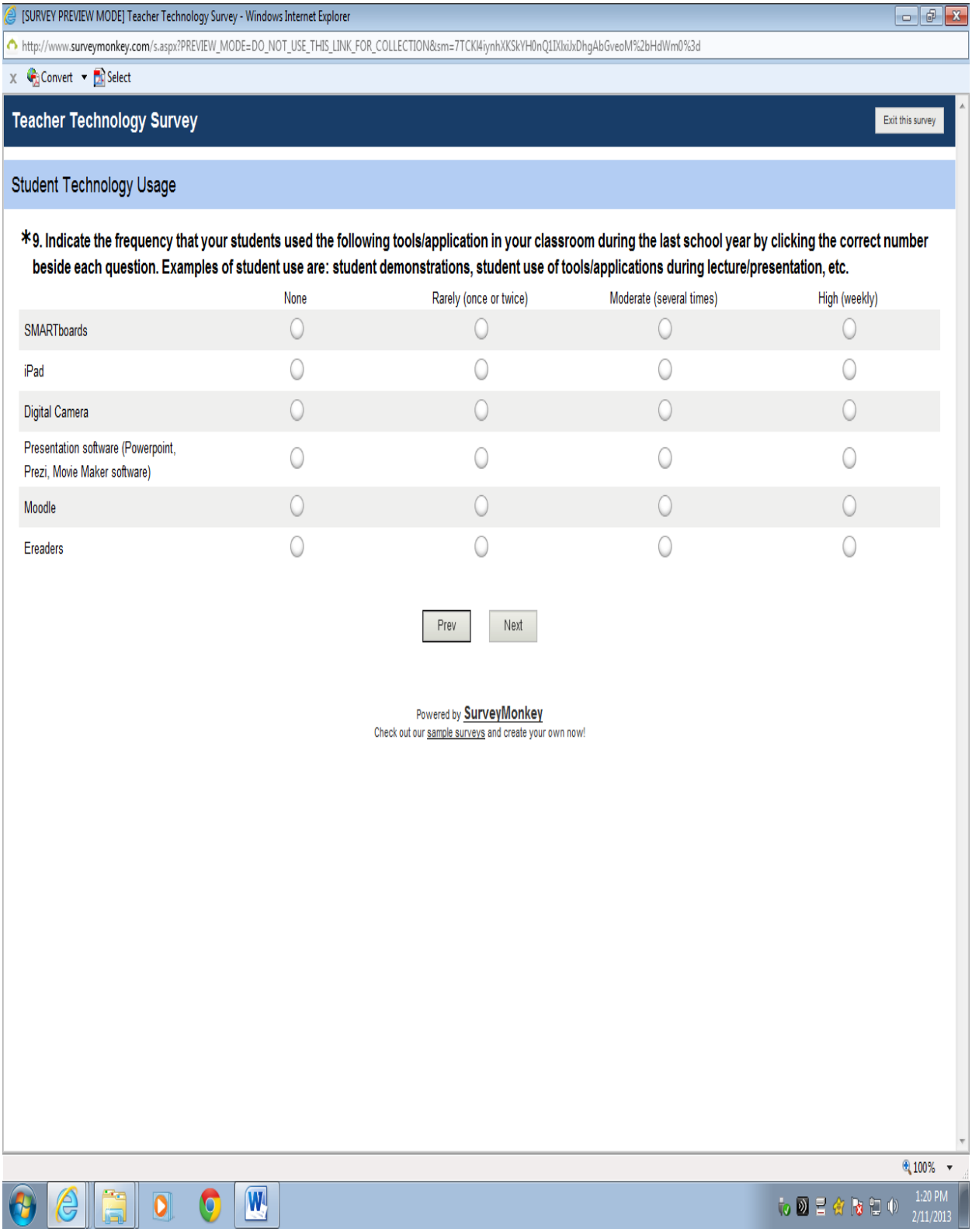
APPENDIX A: COPY OF TEACHER TECHNOLOGY SURVEY

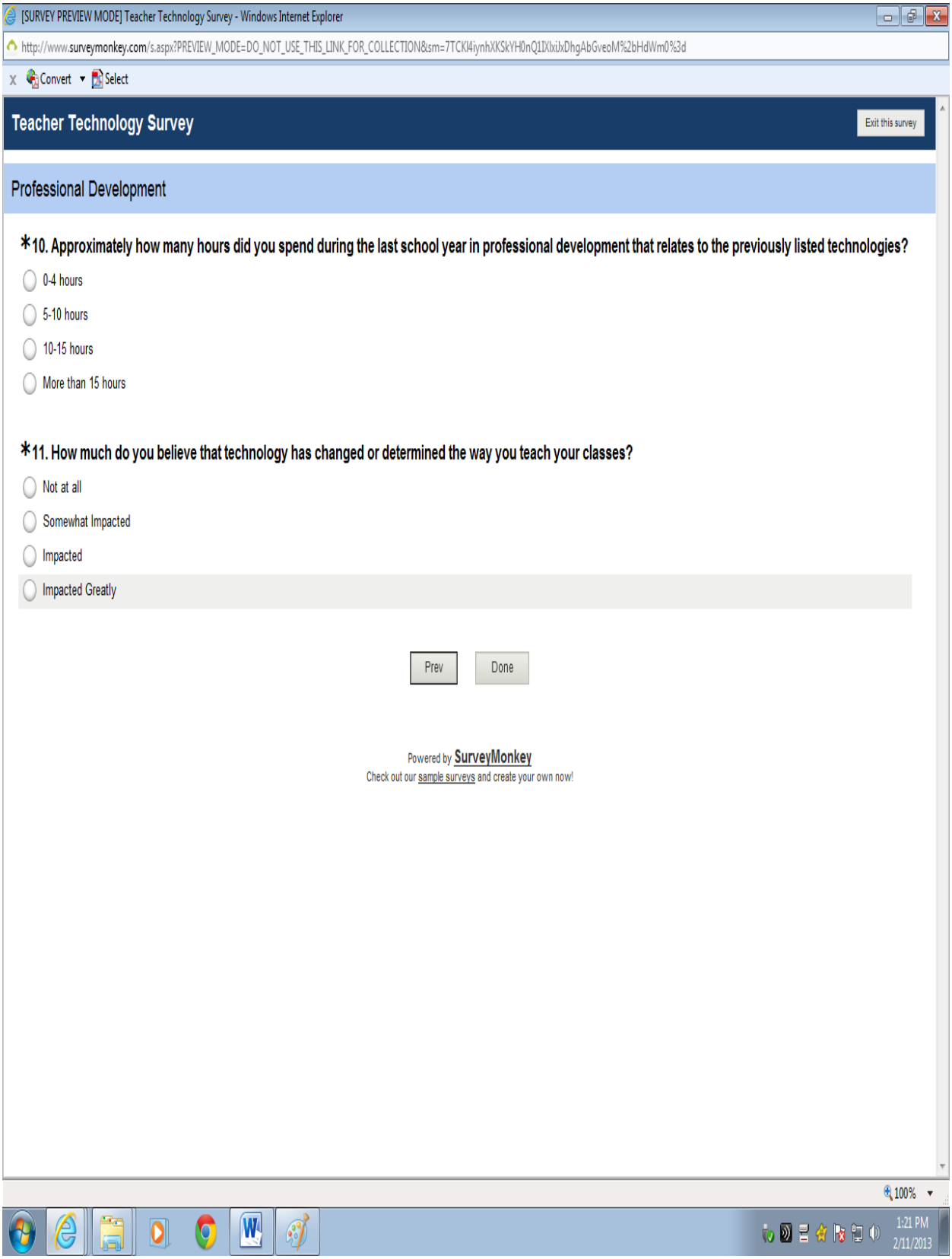



[SURVEY PREVIEW MODE] Teacher Technology Survey - Windows Internet Explorer
http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=7TCKI4iynhXKSkYH0nQ1IXlxiJxDhgAbGveoM%2bHdWm0%3d
Convert
Select
Teacher Technology Survey
Exit this survey
Teacher Self-Efficacy
*5. Indicate how true you feel the following statements are by clickling the appropriate number underneath each statement.
Not at all true
Somewhat true
Mostly true
Exactly true
I am convinced that I am able to successfully teach all relevant subject content to even the most difficult students.
I know that I can maintain a positive relationship with parents when tensions arise.
When I try really hard, I am able to reach even the most difficult students.
I am convinced that, as time goes by, I will continue to become more and more capable of helping to address my students' needs.
Even if I get disrupted while teaching, I am confident that I can maintain my composure and continue to teach well.
Prev
Next
Powered by SurveyMonkey
Check out our sample surveys and create your own now!
100%
1:14 PM
2/11/2013


[SURVEY PREVIEW MODE] Teacher Technology Survey - Windows Internet Explorer
http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=7TCKI4iynhXKSkYH0nQ1IXlxiJxDhgAbGveoM%2bHdWm0%3d
Convert
Select
Teacher Technology Survey
Exit this survey
Teacher Self-Efficacy Continued
*6. Indicate how true you feel the following statements are by clicking the appropriate number underneath each statement.
Not at all true
Somewhat true
Mostly true
Exactly true
I am confident in my ability to be responsive to my students' needs even if I am having a bad day.
If I try hard enough, I know that I can exert positive influence on both the personal and academic development of my students.
I am convinced that I can develop creative ways to cope with system constraints (such as budget cuts and other administrative problems) and continue to teach well.
I know that I can motivate my students to participate in innovative projects.
I know that I can carry out innovative projects even when I am opposed by skeptical colleagues.
Prev
Next
Powered by SurveyMonkey
Check out our sample surveys and create your own now!
100%
1:16 PM
2/11/2013


[SURVEY PREVIEW MODE] Teacher Technology Survey - Windows Internet Explorer
http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=7TCKI4iynhXKSkYH0nQ1IXlxiJxDhgAbGveoM%2bHdWm0%3d
Convert
Select
Teacher Technology Survey
Exit this survey
Teacher Technology Usage
*7. Which of the following technologies do you have access to in your classroom? Please mark all that apply.
SMARTboards
iPad
Digital Camera
Presentation Software (Prezi, Movie Maker, etc.)
Moodle
Ereaders
None of the above
*8. Indicate the frequency that you used the following tools/applications in your instruction during the last school year by clicking the correct number beside each questions. Examples of teacher use are: teacher demonstration, use of tools/applications during lecture/presentations, etc.
None
Rarely (once or twice)
Moderate (several times)
High (weekly)
SMARTboards
iPad
Digital Camera
Presentation software (Powerpoint, Prezi, Movie Maker software)
Moodle
Ereaders
Prev
Next
Powered by SurveyMonkey
Check out our sample surveys and create your own now!
100%
1:18 PM
2/11/2013


[SURVEY PREVIEW MODE] Teacher Technology Survey - Windows Internet Explorer
http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=7TCKI4iynhXKSkYH0nQ1IXlxiJxDhgAbGveoM%2bHdWm0%3d
Convert
Select
Teacher Technology Survey
Exit this survey
Student Technology Usage
*9. Indicate the frequency that your students used the following tools/application in your classroom during the last school year by clicking the correct number beside each question. Examples of student use are: student demonstrations, student use of tools/applications during lecture/presentation, etc.
None
Rarely (once or twice)
Moderate (several times)
High (weekly)
SMARTboards
iPad
Digital Camera
Presentation software (Powerpoint, Prezi, Movie Maker software)
Moodle
Ereaders
Prev
Next
Powered by SurveyMonkey
Check out our sample surveys and create your own now!
100%
1:20 PM
2/11/2013


[SURVEY PREVIEW MODE] Teacher Technology Survey - Windows Internet Explorer
http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=7TCKl4iynhXKSkYH0nQ1IXlxiJxDhgAbGveoM%2bHdWm0%3d
Convert
Select
Teacher Technology Survey
Exit this survey
Professional Development
*10. Approximately how many hours did you spend during the last school year in professional development that relates to the previously listed technologies?
0-4 hours
5-10 hours
10-15 hours
More than 15 hours
*11. How much do you believe that technology has changed or determined the way you teach your classes?
Not at all
Somewhat Impacted
Impacted
Impacted Greatly
Prev
Done
Powered by SurveyMonkey
Check out our sample surveys and create your own now!
100%
1:21 PM
2/11/2013

APPENDIX B: IRB APPROVAL LETTER

East Tennessee State University
Office for the Protection of Human Research Subjects • Box 70565 • Johnson City, Tennessee 37614-1707
Phone: (423) 439-6053 Fax: (423) 439-6060

IRB APPROVAL – Initial Exempt

November 19, 2012

Stephanie Tweed

RE: Techonology Implementation: A Look at How Teacher Age, Years of Experience, Self-Efficacy and Quality Professional Development Affect Classroom Technology Integration
IRB#: c1112.2e
ORSPA#: ,

On **November 16, 2012**, an exempt approval was granted in accordance with 45 CFR 46. 101(b)(). It is understood this project will be conducted in full accordance with all applicable sections of the IRB Policies. No continuing review is required. The exempt approval will be reported to the convened board on the next agenda.

☐ Form 103; Narrative (dated 10/15/12); Potential Conflict of Interest form; CV; Permission emails for Sullivan county schools and Bristol City schools; Survey Questions; Survey Email Script; Assurance Statement

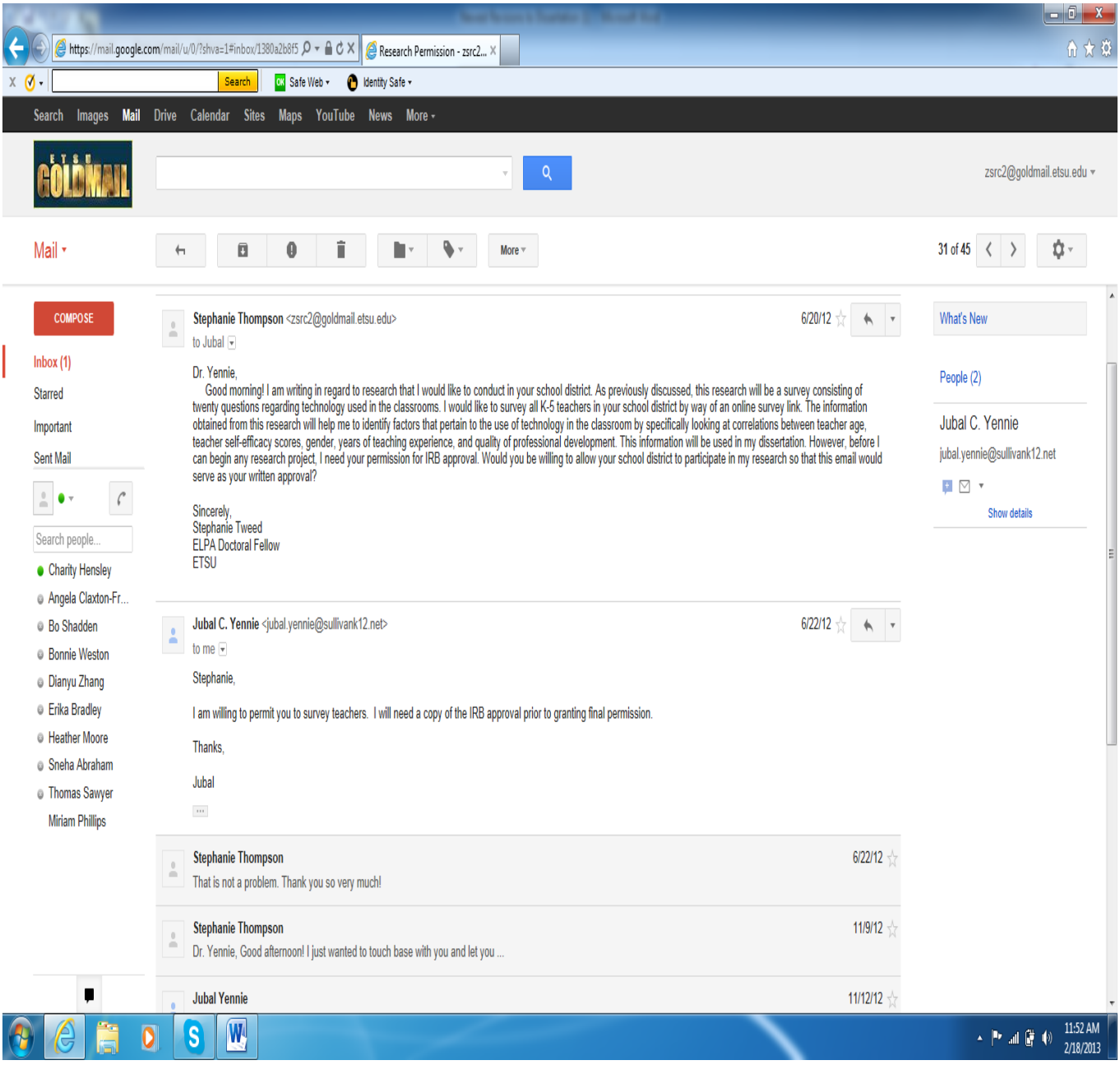
Projects involving Mountain States Health Alliance must also be approved by MSHA following IRB approval prior to initiating the study.

Unanticipated Problems Involving Risks to Subjects or Others must be reported to the IRB (and VA R&D if applicable) within 10 working days.

Proposed changes in approved research cannot be initiated without IRB review and approval. The only exception to this rule is that a change can be made prior to IRB approval when necessary to eliminate apparent immediate hazards to the research subjects [21 CFR 56.108 (a)(4)]. In such a case, the IRB must be promptly informed of the change following its implementation (within 10 working days) on Form 109 (www.etsu.edu/irb). The IRB will review the change to determine that it is consistent with ensuring the subject's continued welfare.

Accredited Since December 2005

APPENDIX C: EMAIL VERIFICATION FROM SCHOOL SUPERINTENDENT



VITA

STEPHANIE R. TWEED

Personal Data:	Date of Birth: February 8, 1982
	Place of Birth: Greeneville, Tennessee
	Marital Status: Married
Education:	Public Schools, Greeneville, Tennessee
	B.A. Interdisciplinary Studies, East Tennessee State University, Johnson City, Tennessee, 2004
	M.A. Educational Leadership, Union College, Barbourville, Kentucky, 2008
	Ed.S. Curriculum and Instruction, Lincoln Memorial University, Harrogate, Tennessee, 2010
	Ed.D. Educational Leadership and Policy Analysis, East Tennessee State University, Johnson City, Tennessee, 2013
Professional Experience	Teacher, Ottway Elementary School: Greeneville, Tennessee, 2004-2010
	Educational Program Coordinator, GoTrybe, LLC: Johnson City, Tennessee, 2010-2011
	Graduate Fellow, East Tennessee State University, Johnson City, Tennessee, 2011-2013
Publications:	Tweed, S., & Flora, B. (In Review). Human resource policies and school cultures: Two domains where policymakers and educational leaders can directly influence teacher motivation. *Academy of Educational Leadership.*

Tweed, S., Phillips, M., & Scott, P. (2012). Leadership, service, and community: A regional focus. International Conference on Learning and Administration in Higher Education. Nashville, TN.