FACTORS INFLUENCING TEACHERS' TECHNOLOGY SELF-EFFICACY: A CASE STUDY

by

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Liberty University

A Dissertation Presented in Partial Fulfillment

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ABSTRACT

Factors influencing teachers' levels of technology self-efficacy were examined through a qualitative multi-site, multi-subject case study research design. An initial survey was administered to all full-time, certified teachers at three school sites in order to gauge teachers' current level of technology self-efficacy. From that population, purposive and systematic samplings were used to draw the participants for the case study. A group of nine teachers with varying levels of technology self-efficacy was interviewed and participated in one of three focus groups to better understand factors influencing their current level of self-efficacy. A document analysis was also performed of local school professional development plans. Results revealed several factors that influenced teachers' technology self-efficacy, including personal, behavioral, and environmental factors. Common themes emerged that indicate more can be done to foster increased technology self-efficacy in teachers, which may in turn enhance students' learning experiences.

Descriptors: Teacher self-efficacy, technology in education, technology integration, 21st century learning, instructional technology.

DEDICATION

I would like to dedicate this work to my husband, Joey, and my baby girl, Allie Caroline, who will soon be joining our lives. Joey, your unconditional love and support have been and continue to be sources of great strength and motivation to me. I am so blessed that the Lord brought us together to build a life and a home. Thank you for understanding when, on many evenings, weekends and holidays, I had to spend hours at the library working instead of spending time with you. You love me, encourage me, and keep me balanced. You *are* the love of my life. To our daughter Allie Caroline, words have never failed me, but mommy cannot even begin to describe what you mean to me and the joy you have already brought and will continue to bring to our lives. You have introduced me to a new and awesome love, and I pray that the example I have set shows you that you can do anything you want to with hard work, dedication, and God's love.

And to my parents, you are two of the most generous and hard working people I have ever known. All that I know about being a wife, a mother, a daughter, a sibling, a friend, and a worker is a result of your modeling. Your support of and love for me have been unwavering, and for that, I am truly thankful. To my grandmother, Mimi, you have always been one of my biggest cheerleaders, and I still want to be you when I grow up! Finally, to my late grandfather, Papa, I know you are watching down on me, smiling and thinking, "I'm proud of you, A.C.!"

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I want to thank my family who encouraged me along the way throughout this journey and believed in me. Thank you to my friends who offered support, many times through Facebook messages or comments. Every bit of encouragement lifted me up and kept me focused on my goal. I also want to thank my chair, Dr. Kuhne, who always provided me with timely feedback and worked to keep this journey in motion. Thank you to my committee members, research consultant, and APA editor who also provided thoughtful feedback and encouragement along the way.

I would also like to express my gratitude to my colleagues and boss who encouraged me, helped hold me accountable for making continuous progress on my

writing, and oftentimes served as sounding boards when I wanted to bounce around ideas for my study or share frustrations, confusions, and heartache about the complexity of the work. It is a true blessing to work with such supportive people!

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

Computer Technology Integration (CTI)

Digital Video Disc (DVD)

Digital Video Recorder (DVR)

Global Positioning System (GPS)

Institutional Review Board (IRB)

Local School Technology Consultant (LSTC)

Macintosh Apple Computer (MAC)

No Child Left Behind (NCLB)

Parent Teacher Association (PTA)

Partnership for 21st Century Skills (P21)

Social Cognitive Theory (SCT)

CHAPTER ONE. INTRODUCTION

Background

Now more than ever before, society has become dependent upon digital technologies to stay connected to the world. In education, it is no different. Many students in schools today can be observed walking through hallways with a cellular phone attached to one hip and headphones lodged into one or both ears while they listen to their newly uploaded songs from iTunes. It is not uncommon to see students multitasking with technology between classes or at lunch as they text a friend or family member using one hand and scan through their iPod playlist on the other. As a result of technology's influence on adolescents today, young people expect to be merely a mouse click or "Google" search away from the information they seek.

In order to meet students where they are, it becomes increasingly important for educators to tap into students' digital world and engage them through one of the numerous technologies available to them (U.S. Department of Education, 2010). In some areas of the world, school districts may not have the access to such resources, but more and more school districts are seeing the value in finding ways to incorporate these technologies into their budgets because of the potential positive effects such resources have on student engagement (U.S. Department of Education, 2010). However, with respect to school districts that have these resources, there are still computer labs going unused throughout the school year, LCD projectors and wireless laptop carts that never leave their media storage closets, and other available digital software that go unnoticed (Littrell, Zagumny, & Zagumny, 2005).

Using technology for instructional purposes may have widespread, positive effects on students as various technologies offer relevant and engaging opportunities for meaningful learning experiences (Shell et al., 2005). Additionally, when students use technology in an exploratory/inquiry sense, they are actively engaged in their learning because they are interacting with their preferred medium of learning.

Many teachers are aware of the technology that is available to them for instructional purposes, yet for one or more reasons, teachers are not capitalizing on the opportunity to integrate such resources into their classrooms. Previous studies have identified several reasons for underutilized technology including but not limited to lack of resources, lack of training, philosophical beliefs about technology, and lack of time to experiment with technology tools (Compeau & Higgins, 1995; Kellenberger & Hendricks, 2003; Littrell, et al., 2005; Teo, 2009; Wang, Ertmer, & Newby, 2004). Many researchers attribute underutilized technology to teachers' lack of self-efficacy in incorporating such resources into their classrooms (Kellenberger, & Hendricks, 2003). Not surprisingly, educators who feel uncomfortable using technology are unlikely to incorporate it because of the fear associated with using something with which they have limited experience. Previous studies have identified several factors that may play a role in teachers' decisions to integrate technology into their classrooms, self-efficacy being one of those factors (Compeau & Higgins, 1995; Kellenberger & Hendricks; Littrell, et al., 2005; Teo, 2009; Wang, Ertmer, & Newby, 2004). However, studies that attempt to identify and explain how technology self-efficacy is constructed have not been conducted.

Self-efficacy has a theoretical foundation grounded in social cognitive theory and was developed by former APA president Albert Bandura (2001). Bandura (2001) explained that self-efficacy refers to one's beliefs in one's capabilities to organize and execute the courses of action required to produce a given outcome. Using this definition, self-efficacy plays a role in the behavior one chooses to demonstrate. If one believes that he or she is incapable of performing a particular action, then he or she may not attempt to carry out said action. Bandura (2001) also discussed that self-efficacy theory is a common theme in relation to motivation, mostly as a result of its power to predict one's behavior.

In holding to this concept of self-efficacy and realizing the predictive power it has on behavior, there is value in examining factors that affect self-efficacy and desired behaviors. In an educational sense then, understanding teachers' self-efficacy with respect to various instructional practices is significant. However, looking at teacher self-efficacy in a general sense may not provide educators and policy makers with the necessary information needed to guide them toward meaningful decision-making (Henson, 2002). Instead, there is a need to focus on specific aspects of teachers' self-efficacy, such as teachers' technology self-efficacy because "those individuals with high levels of self-efficacy are most inclined to accept change and choose the best option" (Moersch, 1995, p. 40). By examining teachers' technology self-efficacy specifically, one is able to narrow the focus of teachers' general beliefs of their capabilities in performing any of a number of tasks to their beliefs about their abilities to perform particular types of tasks. If specific factors affecting teachers' levels of technology self-efficacy can be

identified, then that information can inform educational stakeholders of aspects that have the ability to move teachers further along the technology integration continuum. Additionally, this same information can aid staff developers in creating and providing opportunities for meaningful, purposeful and relevant professional development for teachers.

Problem Statement

Given what is known about self-efficacy and its potential to predict behavior, it is useful to examine teachers' levels of technology self-efficacy and factors that affect their current levels. Factors influencing teachers' technology self-efficacy have not been specifically identified in the literature. According to Teo (2009), "few studies have investigated the nature of self-efficacy beliefs in technology for teaching" (p. 8). According to Crittenden (2009), Bandura has identified four general sources of self-efficacy, which include performance accomplishments, vicarious experiences, verbal persuasion, and physiological states. Although these general sources of self-efficacy are known and help to inform those attempting to influence self-efficacy, also helpful would be identifying specific factors related to these general sources given a particular context. Further research measuring efficacy, according to Henson (2002), calls for additional methods of efficacy evaluation "because an efficacy judgment is a result of an individual's filtering of internal and external factors, [and] the context surrounding a person's judgment is very relevant to the study of teacher efficacy" (p. 147). Henson's statement supports that it is valuable to examine self-efficacy within a specific context because self-efficacy is contextually situated. With this in mind, narrowing self-efficacy

from a general sense down to a specific one, in this case, teachers' technology self-efficacy, is valuable.

According to Holden and Rada (2011), "school districts might increase teachers' acceptance and use of current technologies by focusing on increasing influential individual external factors, such as self-efficacy" (p. 343). Thus, focusing on increasing self-efficacy requires examining specifically those individual external factors that develop self-efficacy. Holden and Rada (2011) suggested that by increasing teachers' technology self-efficacy, they might directly increase their acceptance of technology and also indirectly increase their usage of technology. Henson (2002) noted that measuring a person's judgment is poorly captured by Likert-type questionnaires, so using a qualitative approach will provide a more in-depth understanding of the target construct. By first identifying one's self-efficacy level through quantitative measures and then further exploring how that self-efficacy level was developed through qualitative methods, it is possible to identify specific factors that might influence one's self-efficacy. Breaking it down even more, measuring teachers' technology self-efficacy and then examining factors influencing their technology self-efficacy could provide educational leaders with the information they need to positively affect teachers' technology self-efficacy and ultimately promote the integration of technology by teachers in their classrooms. Previous researchers have examined isolated variables that describe teacher technology use, according to Palak and Walls (2009); and rarely were relationships among factors affecting teacher technology use in the classroom described. According to Moersch (1995), technology "has been the rallying cry for leading many school districts into the

21st century" (p. 40). Furthermore, Brown, Holcomb and Lima (2010) asserted that "technology self-efficacy has come to play a crucial role in the preparation and implementation of educators who can successfully use educational technology to enhance student learning" (p. 121). It is important then, to address teachers' technology self-efficacy and identify ways in which it can be influenced.

Purpose Statement

The purpose of this qualitative multi-site, multi-subject case study was to examine teachers' levels of technology self-efficacy in order to identify specific factors affecting their current level. Previous research supports that teachers' technology self-efficacy is one of several factors influencing teachers' use of technology (Teo, 2009). This study attempted to go beyond identifying teachers' levels of technology self-efficacy to understand specific contextual factors affecting teachers' levels of technology self-efficacy.

Significance of the Study

This study identified factors that influenced teachers' technology self-efficacy, which previous studies had not done. The information discovered as a result of the study has the power to inform educational stakeholders of ways to enhance the overall educational experience of students. With factors affecting teachers' technology self-efficacy identified, educational leaders and policy makers can focus their efforts toward those factors as a way to equip teachers with the tools they need to enhance learning for students. Enhancing such experiences will enable students to better navigate through and among the global world in which they now live and must later work (U.S. Department of

Education, 2010). For a long time, the U.S. has been a strong competitor in the working world, but every day other countries continue to make strides that pose a challenge for the U.S. to stay competitive with other, emerging global forces (Friedman, 2007). In order for the U.S. to produce workers who can compete and thrive in the global market, U.S. educational institutions at all levels must be able to be innovative, creative, and well-versed in the strategies they employ to help students learn and grow and ultimately become self-sufficient, successful members of society.

U.S. educators and policy makers have not only a duty but also a responsibility to students to provide them with the knowledge and resources that will enable their success in the future. Recognizing this duty and responsibility is not enough though. Educators must first equip themselves with the knowledge and resources necessary to provide innovative, creative, and meaningful learning experiences. Therefore, if educators lack such skills, then the U.S. is at a growing disadvantage. What is known is that technology is an integral part of today's world and that self-efficacy plays a critical role in one's decision to adopt a certain behavior. What is not known however, is how to purposefully affect teachers' technology self-efficacy. According to Henson (2002), "If teacher efficacy is the powerful predictive construct it has been thought to be, then research examining the processes by which such efficacy is built is critical to fostering teacher efficacy and, ultimately, changing behavior" (p. 142). Technology self-efficacy, for the purposes of this study, refers to "teachers' beliefs in their capacity to work effectively with technology" (Wang, Ertmer, & Newby, 2004, p. 231).

By conducting research that specifically examined factors that influence teachers'

technology self-efficacy, it became possible then to purposefully create opportunities to affect self-efficacy and ultimately change teacher behavior with respect to using technology. As a result of the information gleaned from this study, U.S. educators and policy makers can focus and target their time, energy, and resources in a meaningful way so as to positively affect change in ways that create opportunities for learning the skills required to be successful in a 21st century global market (Adams, 2008; Mullen & Wedwick, 2008). With respect to the school district involved in this study, the information gleaned as a result of the research has the power to aid all stakeholders in creating opportunities for not only teachers but also students to learn and become proficient in skills that will make them competitive in the workforce.

Research Questions

The following questions guided this study:

1) What factors affected teachers' levels of technology self-efficacy?

This primary research question was at the heart of the research study, as the answer to this question has the power to inform educational institutions as to how they can target their resources in a purposeful way to produce positive, far-reaching outcomes (Henson, 2002).

2) How or in what way(s) were identified factors related to professional development opportunities regarding technology?

Understanding how and in what ways identified factors relate to professional development will be helpful in creating and delivering future professional development opportunities for educators that will enhance their skills for using technology in the

classroom (Wang et al, 2004).

3) What similarities and differences existed between and among teachers of varying technology self-efficacy levels?

By identifying similarities and differences between and among teachers of varying technology self-efficacy levels, it becomes possible initially to better target those teachers who display particular characteristics so that they may either receive additional support early on or approaches to lead efforts to help others build their skills. Particularly identifying those teachers with high technology self-efficacy and enlisting their support to lead change efforts is a cost-effective way to leverage resources to enhance the skills of others (U.S. Department of Education, 2010).

Research Design

A qualitative multi-site, multi-subject case study design was chosen for this study. Initially, a Likert survey was used to quantify teachers' current levels of technology self-efficacy. The survey included demographic questions that aided in identifying the participants. The survey link was distributed to teachers electronically via an email sent to and forwarded by their local school principal. The expected survey response rate was 50 percent. Once surveys were returned, nine teachers from three different school levels (elementary, middle, and high) were selected through purposive and systematic samplings to participate in one-on-one interviews and focus groups. A document analysis of professional development materials related to technology from each school was then conducted to determine the nature of the professional development opportunities provided to the participating teachers.

The local school sites for this study were selected on the basis of available access to the researcher. The district site of interest was a large, urban public school district in northeast Georgia. Also of interest was the availability of and access to a variety of technological resources for educators. The target sample that participated in the study included nine teachers—three from each of the school levels in the district (elementary, middle, and high). For convenience purposes for the researcher and participants, three separate focus groups were conducted, each at the local school sites. From each school the three teachers of focus were one from each technology self-efficacy level (low-to-medium, medium-to-high, very high) as calculated by the initial survey that was administered to all three schools.

Previous studies on teachers' technology self-efficacy have been conducted quantitatively, in large part seeking to quantify the level of teachers' technology self-efficacy. However, further research, qualitative in nature, is needed to fully understand how self-efficacy is affected (Henson, 2002). For purposes of this study, I sought to understand what factors affected teachers' levels of technology self-efficacy and why, thus I chose a qualitative inquiry approach.

Definitions

Throughout this study, specific terms were used frequently to discuss major aspects of the research. Technology self-efficacy, for purposes of this study, referred to teachers' belief in their ability to integrate technology into their classroom successfully. Also, note that technology integration for purposes of this study involved going beyond using technology for administrative or housekeeping tasks such as record keeping, taking

attendance, sending emails, or presenting information via a Power Point presentation. Technology integration referred to the actual and deliberate fusing of technology tools into both teaching and learning aspects of the classroom. Teachers may integrate technology through online blogging activities, creating websites for interactive use with their students, creating original products through the medium of various computer software programs, etc. Finally, factors influencing technology referred to specifically identified reasons or aspects that played a role in developing a teacher's level of technology self-efficacy.

CHAPTER TWO. LITERATURE REVIEW

Technology now plays a critical role in today's society and is considered to be an essential tool used in the workforce. As a result of technology's influence throughout the world, educators around the globe have taken notice of the need to equip young people with 21st century technological skills. In response to this growing need to enhance students' skills, educators, educational leaders, and policy makers have led reform efforts to target this need and develop resources that will help students to be competitive in the global market. An essential resource that educational leaders and policy makers focus a good deal of their time, energy and funds toward is teachers. Recognizing that teachers play a crucial role in developing and enhancing students' skills, it becomes vital for teachers to be equipped with the 21st century technological skills as well; however, if teachers lack the confidence to carry out instruction that targets such skills, they will not be very likely to use such skills in their classrooms.

This chapter is organized to provide an understanding of the theoretical framework that guided this study as well as a review of related literature relevant to this study, including technology's role in education, technology reform efforts, 21st century learning skills, technology as an instructional tool, technology as it relates to student engagement and achievement, students' and teachers' beliefs about technology, technology self-efficacy as a factor influencing technology use, and measuring technology self-efficacy. These concepts will help develop a knowledge base regarding technology and self-efficacy.

Theoretical Framework

The theoretical framework for this study is mostly grounded in Albert Bandura's (1977) social cognitive theory. Self-efficacy is a major component of social cognitive theory.

Social cognitive theory. Social cognitive theory combines motivation and constructivist thinking into one as well as echoes aspects of socioculturalism. Social cognitive theory is grounded in an agentic perspective, which means humans are their own agents of change (Bandura, 2001). Humans, as their own agents of change, are in charge of their actions and actually deliberately choose their actions. Bandura founded social cognitive theory and believes that people are not only products of their environment but also producers of it (Bandura, 2006). People are producers of their environment in that they actively pursue courses of action and create their own experiences as a result. According to Henson (2002), because agency is affected by people's efficacy, their beliefs about their efficacy have the power to influence and determine their choices, effort, determination, and even emotions.

Self-efficacy. Self-efficacy connects to motivation, constructivist thinking, and social cognitive theory. Efficacy refers to one's perceived ability and is best determined or measured when in relation to a specific context or task. Focusing on a specific task is important because one's perceived ability can easily change based on a given context. According to Bandura (1994), "self-efficacy beliefs determine how people feel, think, motivate themselves and behave" (p. 2). Efficacy involves one's own perceptions or thinking about his or her ability and connects to motivation. People's thoughts influence

their actions and motivate them to attempt or restrain from certain behavior (Bandura, 2002). With regard to teacher efficacy, teachers' beliefs about their teaching abilities will affect their teaching behavior (Henson, 2002). This behavior includes but is not limited to how they plan and prepare for instruction, the strategies they implement, the tools they use during instruction, and their personal presence when delivering instruction. Additionally, with regard to teacher efficacy, it is important to note that teachers' self-efficacy can be tied to students' self-efficacy (Henson, 2002). In classrooms with teachers who have high self-efficacy, there are students who may have increased self-efficacy as well. If students feel more confident, then they may be more motivated to put forth more effort, persist longer when faced with academic challenges, and ultimately perform at higher levels.

Self-efficacy, as proposed by Bandura, has four general sources of efficacy-building information, which includes verbal persuasion, vicarious learning experiences, physiological arousal, and performance accomplishments (Bandura, 1977). These four sources are thought to be pathways to understanding efficacy and ultimately one's behavior, but according to Henson (2002), "the investigation of factors that might influence efficacy is certainly warranted" (p. 140). There is a need to identify and understand specific aspects that play a role in developing one's efficacy. If factors that develop one's efficacy can be identified, then work can be done to target those factors in an effort to increase one's efficacy. The higher one's efficacy is, the more motivated a person will be to adopt a certain behavior or perform a particular task, so it is beneficial to develop a person's efficacy in an effort to increase a person's motivation and thus

produce the desired results.

With reference to motivation though, people are motivated by different factors. Some people may be motivated by an internal drive to perform for purposes of self-satisfaction while others may be motivated by external factors such as impressing or pleasing others (Bandura, 2001). Either way, motivation plays a role in an individual's decision to adopt a certain behavior or perform a particular task. Additionally, people with strong self-efficacy have a high assurance in their capabilities to approach challenging tasks, and that factor motivates them to keep going, even when faced with setbacks along the way. Alternately, those who have a low sense of self-efficacy doubt their own capabilities, give up easily, experience anxiety, and lack follow through (Bandura, 1994).

Self-regulated learning connects to the concept of human agency because individuals are making decisions and acting as a result of those decisions. Through choosing and acting on particular experiences, people develop beliefs about their ability in the context of those experiences. If people's experiences are positive, then they may willingly choose to participate in similar experiences in the future. On the other hand, those who faces challenges or even failure in certain experiences will be less likely and less willing to choose to participate in those experiences in the future.

Review of the Literature

Technology and education. Technology has come to play an essential role in education today. As a result of the growing digital world which now exists, technology is almost everywhere and essential to almost everyone. When technology was first

introduced into education, it was used mostly for administrative tasks, such as taking attendance, keeping records, and browsing the Internet. As advancements were made in the field of technology though, technology's role in education shifted from a means of general housekeeping to an interactive instructional tool that allows for more self-regulated learning and personal engagement. In today's competitive global market, an individual is at a major disadvantage without a technological skill set because a wide variety of occupations require technologically literate workers. In his remarks at the Association of American Publishers Annual Meeting, Secretary Arne Duncan (2010) stated, "I ask you to join the great endeavor to not just reform education but to transform it. I challenge you to put your talent and ingenuity to work to equip 21st century students with 21st century skills" (para. 5). It has become the charge of educators to build that essential skill set so that students can compete in and contribute to the global society into which they will soon enter.

Technology and education reform in the United States. Current educational reform targets the use of instructional technology to support active student learning; as a result, a significant amount of money has been invested to supply schools with technological resources (Palak & Walls, 2009). Technology-based learning is believed to be essential to improving student performance (U.S. Department of Education, 2010). Additionally, there is a call for schools to become "centers of learning designed to close the gap between the technology-rich and exciting experiences that dominate students' lives outside of school while preparing them for success in today's competitive global marketplace" (Duncan, 2010, para. 8). There is a challenge currently to leverage what

students already know about technology and help them to learn and create engaging learning experiences that are meaningful, relevant, and realistic to their personal lives now and in the future (U.S. Department of Education, 2010). Education is and continues to be data-driven, and technology aids educators and policy makers in being able to gather the necessary data more efficiently than ever before. Not only can technology aid teachers in engaging students, it can build the capacity for educators to model connected learning communities (U.S. Department of Education, 2010). According to the U.S. Department of Education's National Technology Plan for 2010:

> To achieve our goal of transforming American education, we must rethink basic assumptions and redesign our education system. We must apply technology to implement personalized learning and ensure that students are making appropriate progress through our K-12 system so they graduate. These and other initiatives require investment, but tight economic times and basic fiscal responsibility demand that we get more out of each dollar we spend. We must leverage technology to plan, manage, monitor, and report spending to provide decision-makers with a reliable, accurate, and complete view of the financial performance of our education system at all levels. Such visibility is essential to meeting our goals for educational attainment within the budgets we can afford. (p. 8)

Technology must become an integral and essential component in schools, used by all people of the community. Consequently, the United States must find ways to integrate technology successfully while maintaining financial stability.

The No Child Left Behind Act (NCLB), signed into law by George W. Bush in

2001, not only brought significant changes to schools nationwide, but also changed how schools conducted business, with a focus on integrating technology into all facets of the educational system. The goal of NCLB is to improve student achievement, and technology is identified as a tool to aid in achieving that goal (NCLB, 2009). NCLB, with respect to technology, calls for using technology to gain greater parental involvement, enhance student learning as well as professional development, and provide greater accessibility to the global world for everyone in the educational community (Learning Point, 2007).

In its effort to assist in reforming education, the Partnership for 21st Century Skills (P21) (2010) is a national organization that advocates for 21st century readiness for every student. P21 helps to provide tools and resources that can aid the U.S. education system in keeping up with their global counterparts. P21 operates from a framework that presents a holistic view of 21st century teaching and learning combined with innovative support systems to help students master the skills required of them in the 21st century (2010). The student outcomes refer to skills, knowledge, and expertise students should master, and they include life and career skills, learning and innovation skills, information, media, and technology skills, as well as core subjects and 21st century themes. Additionally, the support systems involved in the framework consist of standards and assessments, curriculum and instruction, professional development, and learning environments (P21, 2010). Using this framework as a guide P21 hopes to realize its mission and advocate for students' successful development and attainment of 21st century skills in order to make a positive impact on the global society.

Technology in Georgia schools. House Bill 1187, which is the A Plus Education Reform Act of 2000, includes provisions for all local schools in Georgia to identify and utilize electronic technology in an effort to enhance instruction in the classroom as well as improve school system management (Georgia Legislature, 2000). According to the Georgia Department of Education (2008), Georgia has a comprehensive five-year state technology plan for Georgia schools. The plan has several purposes, some of which include establishing how technology can improve student achievement, creating a technology plan that can be used as a guide for funding in other states, and meeting NCLB's guidelines for having a state technology plan. Additionally, Georgia's technology plan identifies seven specific goals the state aims to achieve by 2012:

1. Increase effective instructional uses of technology to address QCC learning standards in elementary and secondary schools.
2. Increase effective administrative uses of technology to monitor student achievement of QCC learning standards and to manage business operations in school systems.
3. Increase access for students, educators, parents, school board representatives, and other community members to information technology resources that can enhance student learning.
4. Increase educators' proficiency to use technology effectively to enhance student learning and business operations in elementary and secondary schools.
5. Increase broad-based community support for Georgia's vision for effective technology use in schools.

6. Increase the capacity of school systems to provide the high-quality system support necessary to realize effective technology use, especially in the areas of administrative support for effective instructional technology use; professional development; technical support for hardware, software, and network infrastructure; technology planning; and program evaluation.
7. Achieve and/or maintain equitable access to high-quality technology programs for all students. (Georgia Department of Education, 2003, p. 39)

Essentially, each of these goals demands that educators be able to integrate and use technology for purposes of enhancing students' educational experiences. Without identifying factors that play a role in building teachers' confidence in their own capacity to use technology effectively, the goals set forth by the state of Georgia cannot be realized.

Technology for 21st century learners. Technology is changing the face of the world, and being technologically literate is increasingly important. In order to keep students competitive in the global market, educators have a responsibility to equip students with the tools to be successful in the technological world. Not only does NCLB call for every student to be technologically literate by the eighth grade, but "the literate of the twenty-first century must be able to download, upload, rip, burn, chat, save, blog, Skype, IM, and share" (Mullen & Wedwick, 2008, p. 66). Students who want to be successful in the world must learn and become comfortable with a variety of new media, and schools must take steps to help students acquire these necessary technological skills (Mullen & Wedwick, 2008).

According to Johnson (2009), the 21st Century Skills Movement and its Framework for 21st Century Learning identify four components that describe the skills and knowledge various stakeholders believe to be essential, one of which involves "information, media, and technology skills" (p. 11). In efforts to equip students with 21st century skills, education policy makers must be very deliberate in their focus on training teachers to be able to teach in ways that promote the development of such skills (Rotherham & Willingham, 2009). According to Means (2001), in order to reap the benefits of educational technology, efforts must be made in the areas of teacher preparation and professional development. In order to target teacher preparation and professional development while at the same time being mindful of recent budgetary challenges facing the nation, it is crucial that educational researchers identify those factors that are highly influential in developing teachers' confidence and capacity to use technology effectively.

Today's generation of students has been coined the Internet generation or the N-Gen, as the Internet is a common and essential part of their everyday lives (Adams, 2008). Duncan (2010) reinforced this reality when he stated, "Most young people can't remember a time without the Internet" (para. 28). Students in K-12 schools today are also called digital natives because they have grown up surrounded by various types of digital media, and their brains have been conditioned by their consistent use of computers (Sprenger, 2009). According to Tapscott (2009) as cited in Sprenger (2009), in a "recent study of 2,000 students between the ages of 8 and 18, on average students spend six hours a day connected to some digital communication device, often to several simultaneously"

(p. 34). Not only have students become accustomed to using digital devices, but they commonly use multiple devices at the same time.

As educators attempt to plan instructional activities for the digital natives in their classrooms, there are specific characteristics of this generation that should be taken into account, some of which include:

> Fierce independence—N-Geners are information seekers rather than passive information recipients, and they desire a strong sense of independence.
>
> Inclusion—N-Geners are used to talking with others worldwide and possess a global awareness.
>
> Innovation—N-Geners are at ease with new technology and not afraid to take risks with new ideas and products.
>
> Immediacy—N-Geners live in a "real-time" world and experience a world where things happen fast. (Dorman, 2001)

Given these characteristics that students today possess, educators must be aware of and learn more about the technological world in which they live, work, and most importantly, teach. According to Tapscott as cited in Dorman (2001), the implications of the N-Gen on education posit that classrooms will involve more interactive learning facilitated by technology, less teacher-centered and more learner-centered activities, less instruction-oriented and more discovery-oriented learning, and teachers acting less as transmitters of knowledge and more as facilitators of learning. Also, according to Duncan (2010), "right now, many students' learning experiences in school don't match the reality outside of school" (para. 28). He went on to add that there is a need for educators to find a way to

bridge this existing gap and make learning more relevant and engaging, and part of doing so involves making the "on-demand, personalized tech applications that are part of students' daily lives, a more strategic part of their academic lives" (Duncan, 2010, para. 28). Tom March (2006) discussed the concept of "The New WWW: Whatever, Whenever, Wherever," which points to the fact that students today are used to accessing whatever they want, whenever they want, and wherever they want. March (2006) believed educators must create learning experiences that are "real, rich, and relevant" (p. 19). Authentic learning experiences that challenge students and appeal to their interests are a must with digital natives.

According to the U.S. Department of Education and its 2010 National Education Technology Plan, integrating state-of-the-art technology in the classroom has the power to enable, inspire, and motivate students regardless of their background of achievement. Technology also provides the opportunity for personalized learning, which is another motivator for students. On this same note, 21st century skills include self-directed learning, creativity and innovation (Rotherham & Willingham, 2009).

Technology as an instructional tool. For a long time now, technology has been a part of teachers' day-to-day routines. Many schools now use technology to store and track grades, take attendance, and communicate with colleagues and parents. In recent years, however, technology has played a more active role in schools as it has been used as a form of instruction in teachers' classrooms. More than ever before, teachers are using computers for not only administrative tasks but also instructional purposes. Because states and school districts nationwide are interested in measurable results, educators are

looking to technology to aid them in improving student performance (Rother, 2004). According to Wenglinsky (2005), in the early 1990s, computers rarely appeared in classrooms; the typical computer-to-student ratios in the United States were approximately 1 to 20; and when students did use computers, it was mostly for learning basic computer skills. However, by the end of the 1990s, the computer-to-student ratio was down to 1 to 5, more computers were located in classrooms, and more teachers had participated in training on technology in order to feel more confident using computers as part of their instruction (Wenglinsky, 2005).

Technology is an instructional tool when it is used to engage students and lead them toward constructing new knowledge and skills. Technology creates various learning opportunities because of the access to the global world it provides and the interactive tools it possesses. Digital media such as Twitter and Wikis provide ongoing opportunities for students to blog and share their thoughts with others while interactive white boards allow teachers and students chances to model and practice concepts on a large screen simply with the touch of a finger (Sprenger, 2009). According to Duncan (2010), as a result of the rise of online social networks to obtain information, collaborate and learn, there are limitless opportunities to learn and share ideas in order to create more effective learning experiences. Additionally, technology systems such as language labs exist today; these labs allow students the chance to listen to and speak in their foreign language classrooms while they practice carrying on a conversation with another student a few desks away. This system records multiple students' conversations so that the teacher can listen to the conversations and provide timely feedback to students on their language

skills.

Opportunities are also available for students to develop, design, and maintain web pages that can be accessed by multiple users from all over the world, and a variety of multimedia software is available for students to show their solutions to solving problems and demonstrate knowledge and skills obtained from their learning (Means, 2001). Students today can use WebQuests for research to build their background knowledge of subject-specific content, working at a pace that is individually suitable to their current learning needs. Additionally, easy access to the Internet makes tuning into real-time news and events a reality for teachers and students. The list of possibilities continues as podcasts can be used to record lessons later to be posted online for students who may need to review or who were absent from class that day. Teachers can poll their class about a particular topic by having students text a number using their cell phones, and the teacher can project the poll results onto a big screen immediately using an LCD projector in the classroom (Pool, 2006).

The ways in which technology can be used in the classroom as a result of the many tools that now exist present a variety of innovative and authentic learning opportunities for students. However, these tools pose a unique challenge for educators because they must first learn how to use these tools and then feel comfortable enough planning instruction that integrates such tools. Duncan (2010) affirmed the need for teacher training: "In the 21st century, educators must be given and be prepared to use technology tools; they must be collaborators in learning—constantly seeking knowledge and acquiring new skills along with their students" (para. 27).

Student engagement and achievement. Integrating technology has been found to positively affect students' engagement in the classroom. The implementation of computer technology in the classroom can also foster collaborative learning and facilitate interactions among students (Shell et al., 2005). Previous studies have found that incorporating technology in the classroom leads to increased student achievement (Knezek & Christensen, 2007; Shell et al., 2005). One study involving a technology program called ThinkerTools showed that middle school students who used the technology program outperformed high school students in their ability to apply principles of physics to real-world scenarios (Means, 2001). Technology is beneficial to students when it is used to help students solve problems and develop higher-order thinking skills, according to a study conducted by Wenglinsky (2005). Wenglinsky (2005) also concluded from his study that students will benefit from using technology in the classroom as it will prepare them for the "technology-rich work environment in which many students will find themselves after graduation" (p.32).

Schools now have the opportunity to enhance students' educational experiences by integrating various forms of technology in the classroom. The benefits of learning with new technologies include but are not limited to "increased participation in systems of distributed learning that engage broader communities, learning enhancing representations of concepts and data, a restructuring of teaching and learning roles, and more meaningful assessment practices" (Means, 2001, p. 61). Students who develop a skill set for digital tools and media will have an advantage over students who do not develop such skills because many emerging occupations are computer-intensive (Azzam,

2006). As schools work to prepare students for the future, policy makers must be aware of potential job opportunities for students and work to develop essential skills that will give students a competitive edge when they enter the workforce. In order for students to be fully engaged, which is a must in the 21st century, the use of technology tools and resources is required as is the involvement with interesting and relevant projects and learning environments (Duncan, 2010). Students of the 21st century learn differently and are used to having the interaction that comes with the implementation of digital media technologies.

Students' beliefs about technology. Students' beliefs about technology cannot and should not be ignored as students are the main focus for teaching and learning. Educators' roles involve teaching students so that they will learn and go on to be productive, contributing members to society. How students perceive technology's role in their life both in and outside of school matters because it affects their interest level and engagement. In order for teachers to engage students in the learning process, it is important for teachers to know what students are interested in and what they value; therefore, understanding what interest students have toward technology and what value they place on technology is an important aspect of which educators should be aware.

In a study conducted by Li (2007), students' and teachers' views about technology were explored. In the results of this study, it was found that 87.3% of students liked using technology and believed it could be effective in learning, and four themes emerged that connected to their reasons for believing so: (1) increased efficiency; (2) pedagogy; (3) future preparation; and (4) increased motivation and confidence. In regard

to increased efficiency, Li found that students believed technology made learning easier and allowed for easier access to learning materials. Additionally, students appreciated that using technology allowed for a different approach to teaching and learning that the traditional textbook did not offer. Preparing for the future was another important factor students stated for why they believe technology is useful in the classroom; students in the study recognized how the world is changing as a result of technology, and they understood the importance of acquiring related skills for later in life. Finally, Li found that students enjoyed using technology, which increased their motivation, and through using technology, their confidence level with technology also increased (Li, 2007).

Teachers' beliefs about technology. Teachers' beliefs are foundational to their sense of self-efficacy. Particular beliefs or attitudes about or toward a specific concept or idea will influence their behavior patterns when faced with that concept or idea. According to Loucks-Horsley, Hewson, Love, and Stiles (1998) as cited in Lumpe and Chambers (2001), "beliefs are the ideas people are committed to—sometimes called core values….They shape goals, drive decisions, create discomfort when violated, and stimulate ongoing critique" (p. 93). Teachers' beliefs about technology may be formed through their own experiences with technology inside or outside of the classroom and as a student or as a teacher. The beliefs that are then formed may or may not be in line with research on what has been proven to be best practices (Lumpe & Chambers, 2001). Lumpe and Chambers (2001) also addressed the need for focused efforts to examine teachers' context beliefs about the use of technology in the formal school setting in order to better understand external factors that may play a role in forming teachers' beliefs

about technology use. It is more likely that teachers who believe technology can and will produce positive results for student learning will make the decision to integrate technology into their classrooms.

In the aforementioned study conducted by Li (2007), the teachers believed that "the use of technology demands time and certain skills. Weak students needed to focus on the practice of basic skills rather than wasting time on technology integration" (p. 389). Furthermore, Li found "although all the teachers recognized that their students (regardless of their skill level) loved technology, nobody considered using technology to enhance weak students' understanding" (p. 389). The majority of the teachers in this study believed technology should be used sparingly, and the teachers were cautious to use technology because of the possible negative effects. Another interesting factor that played a role in teachers' decisions to use technology, according to Li, was that teachers feared they may be replaced by computers and some day lose their jobs as a result of technology. One of the most important findings from Li's study was the discrepancy between teachers' and students' views about technology—they were almost always different (Li, 2007). This finding identifies a need to bridge the gap between teachers' and students' views about technology in the classroom.

Self-efficacy as a factor influencing technology use. Previous research has been conducted to identify factors that influence technology use (Compeau & Higgins, 1995; Kellenberger & Hendricks, 2003; Littrell et al., 2005; Teo, 2009; Wang et al., 2004). In these previous studies, self-efficacy, or people's beliefs in their capacity to carry out a given task, was identified as a significant factor influencing people's decisions to use

technology. In fact, "self-confidence in using a computer for work was the strongest predictor of teaching use," (p. 17) according to a study by Kellenberger and Hendricks (2003). Similarly, computer self-efficacy was identified as being significantly influential on people's expectations of outcomes when they use computers as well as their emotional response to computers and their actual use of computers (Compeau & Higgins, 1995; Lambert, Gong, & Cuper, 2008; Palak & Walls, 2009).

According to Bandura (1994), innovative achievements involve a resilient sense of efficacy because innovations pose risks, challenge existing preferences, and require a sustained investment of effort while not knowing what the final results will bring. Integrating technology into the classroom is considered to be an innovative concept because it is different from what has traditionally been done, it requires a shift from teacher-directed learning to student-directed learning, and one must be committed to learning how to use the various technologies now available for classroom use.

Littrell et al. (2005) found in their study that "teachers may not use instructional technology due to low levels of computer self-efficacy" (p. 45). Because self-efficacy is connected to one's own beliefs about his or her capability, if one does not feel capable of performing a task or fears failing at the task, then one is less likely to attempt that task. In the same vein, people will exert a certain amount of effort in performing a task which is said to be congruent with the amount of success they expect to achieve in performing that task (Henson, 2002). In another study by Wang et al. (2004), the authors discussed results from similar studies that indicated that teachers' self-efficacy beliefs are useful indicators of levels of technology integration.

Similarly, Vannatta and Fordham (2004), in the introduction to their study, also discussed how teachers' self-efficacy beliefs played an important role in their decision to integrate technology into their classrooms. According to Henson (2002), "teachers with high efficacy tend to experiment with methods of instruction, seek improved teaching methods, and experiment with instructional materials" (p. 138). Therefore, teachers who may be unfamiliar with technology but have high teaching self-efficacy may take more risks to experiment with technology as a way to enhance their teaching practice.

Measuring technology self-efficacy. Several different scales and surveys have been developed to measure self-efficacy, both in a general sense and for specific technology or computer self-efficacy applications. Developing a measuring tool for self-efficacy is important because "the existence of a reliable and valid measure of self-efficacy makes assessment possible and should have implications for organizational support, training, and implementation" (Compeau & Higgins, 1995, p. 189). Measuring technology self-efficacy specifically allows for the opportunity to gauge more accurately one's particular beliefs in one's capabilities to utilize technology effectively. Additionally, judgments about one's efficacy to perform a specific task or action call for a specific context, and attempting to assess efficacy in a general sense without specific context may invalidate what is actually meant to be assessed ultimately (Henson, 2002). Previous measurement tools of technology self-efficacy have been reviewed, revised, and used to inform current measurement approaches (Compeau & Higgins, 1995).

Compeau developed a Likert-scaled survey that measures individuals' self-efficacy beliefs for technology integration. This survey includes 21 items that assess

people's confidence toward technology use. After being reviewed for both content and construct validity, the survey was deemed valid, and additional data were collected to determine the survey's reliability, which was also found to be convincing (Wang et al., 2004). Another instrument used to measure the self-efficacy construct with respect to technology was developed by Murphy, Coover, and Owen (1989) and is called the Computer Self-Efficacy Scale (CSES). The CSES focuses more on measuring individuals' perceptions of computer-related knowledge and skill factors rather than on individuals' perceptions about their capability to integrate technology (Torkzadeh, Koufteros, & Pflughoeft, 2003).

Summary

It is recognized that technology plays an essential role in today's world. Also, it is recognized how important it is for young people to be equipped with 21st century skills that will allow them to be successful in the technology-rich environment of which they will be a part in the future. In recent years, numerous entities have put time, energy, and resources into building technological capacity into educational institutions at local, state, and national levels with the hope that doing so will produce citizens who can not only survive but also thrive in today's global and tech-savvy market.

Technological advances have created opportunities for educators to enhance learning activities and integrate technology as an instructional tool. Using technology as an instructional tool enables teachers to create a variety of rich, real, and relevant learning experiences that challenge students to problem solve and think critically, skills that will give students a competitive edge as they move from school into the workforce. Today's

students are digital natives, people who have grown up surrounded by digital media, and these N-Geners bring with them a unique set of characteristics that teachers must take into account in order to maximize student learning. Teachers cannot and will not integrate technology into their classroom instruction if they lack the confidence to use technology effectively; thus, it is imperative that policy makers seek to better understand ways to increase teacher confidence with regard to technology integration so that teachers can carry out the jobs they have been hired to do.

Although self-efficacy is a factor that is known to play an important role in one's decision to use technology or rather adopt any of a variety of behaviors, there still remains a need to identify factors that affect teachers' technology self-efficacy so that that information can be used to inform leaders everywhere as to how best to use their resources to develop the best product possible, in this case, human capital. Measuring teachers' technology self-efficacy has been done, but factors influencing teachers' levels of technology self-efficacy remain to be examined. By identifying factors that play a role in developing teachers' technology self-efficacy, educational leaders can focus their efforts in a purposeful and meaningful way so as to better equip teachers with the skills and tools necessary to build students' 21st century skills.

CHAPTER THREE. METHODOLOGY

Introduction

This study explored factors influencing teachers' technology self-efficacy. This study was qualitative in nature because the goal was to obtain a holistic picture and in-depth understanding of a phenomenon (Ary et al., 2006; Rubin & Rubin, 2005). Qualitative research necessitates going into great detail in order to create a visual picture of a study's specific context. According to Merriam (2002), the selection of a specific case to study is dependent upon what the researcher wants to learn and "the significance that knowledge might have for extending theory or improving practice" (p. 179). Previous studies on teachers' technology self-efficacy have been conducted quantitatively, in large part seeking to quantify the level of teachers' technology self-efficacy. For purposes of this study, the goal was to understand what factors affected teachers' levels of technology self-efficacy. The research questions, research design, data collection process, and data analysis procedures of the study are each described in this chapter.

Research Questions

Research questions help to structure and focus the study. The following research questions were used to guide this study:

Research Question 1: *What factors affected teachers' levels of technology self-efficacy?*

Research Question 2: *How or in what way(s) were identified factors connected*

to professional development opportunities regarding technology?

Research Question 3: *What similarities and differences existed between and among teachers of varying technology self-efficacy levels?*

Research Design

A case study design was chosen for this study. According to Ary et al. (2006), "Case studies provide an 'intensive description and analysis of a phenomenon or social unit such as an individual, group, institution, or community" (p. 456). Additionally, Yin (2009) explained that "the case study method allows investigators to retain the holistic and meaningful characteristics of real-life events" (p. 4). A multi-site, multi-subject case study design was appropriate for this study because the goal was to seek a deeper understanding, beyond numbers, of teachers' levels of technology self-efficacy. Specific, individual factors affecting teachers' levels of technology self-efficacy were of primary interest.

In order to conduct the case study, the Computer Technology Integration (CTI) survey (Wang, et al., 2004), was first used. The survey results were quantified and subsequently aided in identifying the subjects that became part of the study. Using multiple sites and multiple subjects provided a wider range of data and thus, more meaningful results. Through the case study design, multiple forms of data collection were implemented including interviews, focus groups, and a document analysis. These sources of information provided the researcher with a more holistic picture. Through this particular design, not only were factors influencing teachers' technology self-efficacy identified, but an exploration in to how and why identified factors influence teachers'

technology self-efficacy occurred. According to Yin (2009), when the investigator is interested in answering "how" and "why" questions, the case study design is the preferred method of research.

Participants

The participants for this case study ultimately included nine teachers from three schools within the district of focus. Both purposive and systematic samplings were used in the study. "Purposeful sampling is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned" (Merriam, 2009, p. 77). First, purposive sampling was used in order to gather participants from each school level so as to include a K-12 outlook for the study. One elementary school, one middle school, and one high school were used in the study. These schools were identified based on soliciting permission from each of the three schools' administrators.

At each of these three schools it was necessary to first conduct a survey using the Computer Technology Integration Survey (CTI) (Wang et al., 2004) of all full-time, certified teachers in order to later take a stratified purposeful sample of those surveys in order to identify three teachers from each school. According to Hatch (2002), "stratified purposeful samples are those that include individuals selected to represent particular subgroups of interest" (p. 98). From each school three teachers were selected: one teacher who currently had a low-to-medium level of technology self-efficacy, one teacher who currently had a medium-to-high level of technology self-efficacy and one teacher who currently had a very high level of technology self-efficacy, as measured quantitatively by

the survey they completed. Teachers were not chosen based on the grade level or subject area they teach, nor were they targeted based on gender, age, or years of teaching experience. The only factor taken into account to gather the sample used for this study was the teachers' current levels of technology self-efficacy.

High school participants. The high school sample included two Caucasian males and one Caucasian female. The male with very high self-efficacy as reported on the survey currently teaches science and has nine years of teaching experience. This experience includes teaching at the high school and university levels, both in the public school setting. The highest level of education this participant has completed is a Doctorate of Education.. For purposes of this study, this participant will be referred to as John Walton.

The male with medium-to-high self-efficacy as reported on the survey currently teaches social studies and has six years of teaching experience. This experience includes teaching a combined six years at two different private middle schools. The current academic school year is the first year this participant has taught in the public school setting and at the high school level. The highest level of education this participant has completed is an Educational Specialist degree. For purposes of this study, this participant will be referred to as George Phillips.

The female with the low-to-medium self-efficacy as reported on the survey currently teaches language arts and has four years of teaching experience. This experience has all been in the public school setting at one high school. The highest level of education this participant has completed is a Bachelor's degree in English education.

For purposes of this study, this participant will be referred to as Alice Stanson.

Middle school participants. The middle school participants included one Caucasian male and two Caucasian females. The Caucasian male with the very high self-efficacy as reported on the survey currently teaches mathematics and has 15 years of teaching experience. This experience includes two years in private school and 13 years at multiple middle schools. The highest level of education this participant has completed is an educational specialist degree. For purposes of this study, this participant will be referred to as Ryan Ferris.

The female with medium-to-high self-efficacy as reported on the survey is currently a media specialist for the current academic school year, but prior to the current school year taught language arts and special education. This participant has 21 years of teaching experience, all in the public school setting. The highest level of education this participant has completed is an educational specialist degree. For purposes of this study, this participant will be referred to as Sarah Duvall.

The female with low-to-medium self-efficacy as reported on the survey currently teaches public speaking and student leadership. This participant has two years of teaching experience, in the public school setting at one middle school. The highest level of education this participant has completed is a Bachelor's degree in middle grades education. For purposes of this study, this participant will be referred to as Lisa Patterson.

Elementary school participants. The elementary school participants included three Caucasian females. The female with very high self-efficacy currently teaches first grade special education students. This participant has 13 years of teaching experience,

with the majority of those years in the private school setting. The highest level of education this participant has completed is a Bachelor's degree in elementary education. For purposes of this study, this participant will be referred to as Marsha Taylor.

The female with medium-to-high self-efficacy currently teaches third grade. This participant has five years of teaching experience, all in the public school setting at three different elementary schools. The highest level of education this participant has completed is a Master's degree in education. For purposes of this study, this participant will be referred to as Ashley Bolden.

The female with low-to-medium self-efficacy currently teaches kindergarten. This participant has 24 years of teaching experience, both in private and public school settings at various elementary schools. The highest level of education this participant has completed is an educational specialist degree. For purposes of this study, this participant will be referred to as Beverly Sims.

Setting

The setting for this case study was one large, urban, public school district in northeast Georgia. I chose this setting because I had easy access to the participants as a result of current employment in the district. This school district has extensive technological resources available to teachers, and individual schools within the district have the freedom to provide teachers with various types of professional development opportunities on technology. The school district in which this study was situated also has a comprehensive technology plan in place. This school district serves approximately 180,000 students in grades K-12.

This school district has a long-standing superintendent (16 years), an executive board/cabinet, three area superintendents, and each school has local school leadership in place, with a principal at the head, accompanied by multiple assistant principals. Elementary schools in the district serve grades K-5; middle schools serve grades 6-8, and high schools serve grades 9-12. Local school principals have a great deal of autonomy with respect to local school staffing and local school initiatives as long as they serve to reinforce the district's mission and vision.

Procedures

Before any data collection began, approval was granted by both Liberty University's Institutional Review Board (Appendix A) as well as the local school district's Institutional Review Board (Appendix B). Additionally, permission was granted to use the Computer Technology Integration Survey (Appendix C) in order to conduct this survey and collect initial data which helped to identify the nine participants for the case study. Furthermore, permission and access to conduct research was granted by the principal of one elementary school, one middle school, and one high school in the district.

Survey results were quantified and categorized into three levels: low-to-medium, medium-to-high and very high technology self-efficacy. Of the collected and quantified surveys, the first survey from each level was used to identify potential participants. Participation in the case study was strictly voluntary, so when/if the first person contacted declined, the next person in the given level was asked to participate. This process continued until three teachers' participation from each school, including one with low-to-

medium, one with medium-to-high, and one with very high technology self-efficacy was secured. Teachers were contacted by email to solicit participation in the case study.

The Computer Technology Integration (CTI) surveys were sent electronically as a link in an email to teachers' school email addresses with information that provided an overview of the study and an informed consent letter that further explained the purpose of the survey and study. This email was sent to the three principals first, and they forwarded the email to their teaching staff, evidencing their endorsement of the study.

After three weeks, the survey results were collected and examined to discard any incomplete or invalid surveys. It was necessary for teachers to put their names on their surveys so that I could contact those teachers who would be chosen for the final sample. Surveys were sorted based on those teachers who fell into one of three levels of technology self-efficacy: low-to-medium, medium-to-high, or very high. These levels were determined by the total score on teachers' surveys. Although the survey results themselves did not directly answer a research question, the results provided a framework for identifying participants for the remainder of the study, which aided me in answering all three research questions.

Once survey results were quantified, categorized, and nine participants were identified and secured, interviews were scheduled. Face-to-face interviews were conducted after participants' regular work hours at a place convenient to each participant and lasted approximately one hour. Interviews began with a set of structured questions but allowed room for open-ended questions and discussion in order to provide the participants freedom to explain their personal experiences with respect to technology.

Interviews were audio recorded with signed participant permission (Appendix H), and then subsequently transcribed. A professional transcription service was hired to transcribe the nine interviews. The professional transcription service hired signed a confidentiality agreement, ensuring that participant names and information would not be shared with anyone outside of the transcription company (Appendix D).

After one-on-one interviews were conducted, three separate focus group discussions were held in order to bring all three participants from each of the three schools together to share their thoughts and beliefs about technology. Participants were contacted by email to schedule the focus group discussions. The focus group discussions took place face-to-face after participants' regular work hours at a place that was mutually convenient for group members. These focus groups were also audio recorded with signed permission from all participants and then transcribed by the same professional transcription service as the interviews.

Finally, a document analysis was conducted using professional development materials from each of the three participating schools. The materials of interest included local school professional development plans, and specifically, those that were strongly connected to technology. These documents were collected and analyzed in order to develop an understanding of professional development opportunities regarding technology that had been offered at the three school sites. It was important to review these documents in order to compare participants' descriptions of these opportunities with the written descriptions provided on the documents. These documents were secured by contacting via email the local school principal and/or other local school leadership

personnel as recommended by each principal.

Researcher's Role

I am an instructional coach housed in the staff development office of the district in which the study was performed. As a member of the staff development department in the district, I have an interest in understanding factors that influence teachers' levels of technology self-efficacy because I believe understanding these factors can help me help others as district leaders seek to positively affect teachers' levels of technology self-efficacy which may ultimately help improve student engagement and achievement. I believe in the importance of professional development as well as integrating technology into the classroom, and I want to find ways to increase teachers' technology self-efficacy. If I can identify and understand the factors that affect teachers' technology self-efficacy, then I will be able to target staff development efforts toward positively affecting those factors.

In this study I took on the role of participant observer. When involved in data collection for the study, it was necessary for me to have some degree of participation in order to lead interviews and focus groups; however, I occupied the observer role during data collection as well, stepping back and allowing for participants to interact authentically with one another and recording those interactions.

Data Collection

Data collection for this case study included multiple aspects as it was necessary to use a variety of gathering methods in order to obtain the in-depth understanding that I sought. Each method allowed for the collection of data that contributed to developing the

overall picture of the topic.

Survey. The survey used for this study was the CTI Survey (Wang et al., 2004) (Appendix E), and it determines one's confidence level with integrating technology into classroom teaching. This survey was used in a similar study measuring pre-service teachers' self-efficacy for technology integration (Wang et al., 2004). There are 21 statements using a five-point Likert scale ranging from 1, SD (Strongly Disagree) to 5, SA (Strongly Agree). All 21 items are positively and consistently worded with the initial stem of "I feel confident that…" (Wang et al., 2004).

According to Wang et al. (2004), the CTI survey was reviewed for both content and construct validity, and the content validity of the instrument was found to be convincing after a panel of experts in the area of self-efficacy reviewed the survey items. The evidence of construct validity is mainly empirical in nature (Wang et al., 2004). A factor analysis was conducted on the survey data gathered in the similar study, and the researchers found the survey to be a valid instrument for measuring the constructs measured in the survey. Finally, "Cronbach alpha coefficients were calculated for both pre-survey data and post-survey data to determine the reliability of the instrument" in that same study (Wang et al., p. 236). The Alpha coefficients of .94 and .96, respectively, supported that the instrument was highly reliable and "holds promise for its use in further research" (Wang et al., p. 236).

Interviews. I used interviews in this case study in order to gather data on each of the nine participants' opinions, beliefs, and feelings about their level of technology self-efficacy. In qualitative research, interviews are used to delve deeper into topics and allow

the researcher to ask people to explain their answers, give examples, and describe their experiences (Rubin & Rubin, 2005). Because self-efficacy is grounded in social cognitive theory, it was essential for me to understand the participants' thoughts toward their own capabilities with technology. The interviews consisted of 16 questions, which I developed (Appendix F). The interview questions were developed with the literature connected to social cognitive theory in mind. According to the research (Bandura, 2001; Locke, 2000; Martin, 2004), personal, environmental, and behavioral factors affect efficacy. Given this fact, several of the interview questions served to address various personal, environmental, and behavioral aspects as they related to the participants. Other interview questions addressed participants' prior experiences with technology as the research also supports that mastery experiences, or performance accomplishments, and vicarious learning experiences are sources of efficacy (Bandura, 1994; Bandura, 2000). Moreover, interview questions were peer reviewed by the dissertation chair and committee members, and suggestions were offered for revision. Those revisions were incorporated and piloted with an outside person not involved in the study. The responses from the pilot interview indicated the revised interview questions would lead to the discovery of valuable information that would contribute to the research findings. The information collected from the interviews served to address all three research questions. Table 1 shows each of the main interview questions as well as to which aspect or source of efficacy it is connected.

Table 1

Interview Questions as Related to Aspects or Sources of Efficacy

Interview Question	Related Aspect of Efficacy
1. How would you describe your attitude toward instructional technology in regard to its role in education as an instructional tool?	Personal
2. How or in what ways have you participated in training that targets the use of instructional technology?	Mastery/Vicarious Learning Experiences
3. How often do you use technology during the regular work day for housekeeping tasks/for instructional purposes?	Mastery/Vicarious Learning Experiences
4. What, if anything, challenges you/scares you about using technology in the classroom? How and why do the things mentioned in #4 challenge you/scare you?	Personal
5. How often do you experiment with/take the time to learn new technology?	Mastery/Vicarious Learning Experiences
6. How important do you think technology is to education and why?	Personal
7. How would you describe technology's role in education?	Personal
8. Do you think using technology is essential to students' future success? Why or why not?	Personal
9. What interests you about using technology in the classroom?	Personal
10. Do you consider yourself a risk-taker? Why or why not?	Behavioral
11. Do you feel you have adequate time during the regular work day to learn about technology to use in your classroom?	Environmental
12. Do you feel you have adequate opportunities and/or time to learn about technology to use in your classroom through other avenues such as professional development seminars/workshops, conferences, summer sessions?	Environmental
13. Do you feel instructional technology engages students more so than other methods of instruction? If yes, why or how?	Personal
14. Describe the local school support you have with using instructional technology in your classroom.	Environmental
15. Do you consider yourself an innovative person? Why or why not?	Behavioral

16.	What more can you tell me about your experiences with instructional technology in relation to your teaching practice?	Mastery/Vicarious Learning Experiences

Focus groups. Three focus groups were used as a way for me to better understand any emerging themes that resulted from the interviews. According to Hatch (2002), "Focus group interviews are often used to supplement other qualitative data" (p.24). In allowing the opportunity for participants to share their beliefs, opinions, and feelings with each other, I was able to glean a more thorough understanding of each group's perspective as well as identify any similarities and differences that existed among the three level groups. The focus group questions (Appendix G) served to further address research questions two and three. Focus group questions were also peer reviewed by the dissertation chair and committee members, and suggestions were offered for revision. Those revisions were incorporated and piloted with outside people not involved in the study. The responses from the pilot focus group indicated the revised focus group questions would lead to the discovery of valuable information that would contribute to the research findings.

Document analysis. A document analysis was necessary in order to better understand factors that may have played a role in participants' level of technology self-efficacy. Professional development materials from each of the three schools were collected and analyzed to determine the characteristics of the technology training to which participants have been exposed. Specifically, these materials provided information in the form of either a list or calendar and accompanying descriptions of the professional development opportunities offered at each of the three schools. A document analysis,

while not directly addressing one of the research questions, provided me with information as to how some factors identified might have influenced how teachers' technology self-efficacy levels were constructed. In qualitative research, the main advantage of artifact collection is "that it does not influence the social setting being examined" (Hatch, 2002, p. 25).

Data Analysis

Data analysis for this case study involved the use of a variety of methods as it was necessary to examine and interpret all the data that were collected. According to Merriam (2009), "data analysis is a complex process that involves moving back and forth between concrete bits of data and abstract concepts, between inductive and deductive reasoning, between description and interpretation," and "the practical goal of data analysis is to find *answers* to your research questions" (p. 176). Data analysis for this study was an ongoing process as new themes and trends were discovered along the way that altered the overall picture that attempts to explain the phenomenon of teachers' levels of technology self-efficacy.

Coding. Auerbach and Silverstein (2003) described coding as "a procedure for organizing the text of transcripts, and discovering patterns within that organizational structure" (p. 31). Coding is the core of qualitative analysis because coding is when and where themes begin to emerge and situate themselves in the data. Merriam (2009) explained that codes can be "single words, letters, numbers, phrases, colors, or combinations of these" (p. 173). Specifically, open coding was used for this case study. Merriam (2009) explained that open coding is called such because as the researcher

begins to examine the data, the possibility of what information might be useful is expansive. According to Auerbach and Silverstein (2003), "You can use an open coding framework without all of the assumptions of grounded theory, coding as you go, rather than preparing a list, refining the concepts, and then marking them in the text" (p. 223). Open coding allowed me to sort through the data looking for units of meaning that seemed to appear regularly and that seemed important to my study.

Auerbach and Silverstein's *Qualitative Data: an Introduction to Coding and Analysis* (2003) guided the coding process for this study. Before initial coding began, the research questions and theoretical framework were revisited to bring the primary research concerns to the forefront of my mind, and then the transcripts were read in their entirety to develop a sense of possible main ideas. This initial step is related to one of the four general strategies Yin (2009) presented as ways to approach data analysis in case study research, which he describes as "relying on theoretical propositions" (p. 130). Yin (2009) further explained that this strategy is useful because "the original objectives and design of the case study presumably were based on such propositions, which in turn reflected a set of research questions, reviews of the literature, and new hypotheses or propositions" (p. 130).

Following this initial step, text that seemed relevant to my research concerns were first identified and subsequently given codes. Merriam (2009) described this process as "indentifying segments" and explained that each "segment is a unit of data which is a potential answer or part of an answer to the question(s) you have asked in this study" (p. 176). Different colors were used to differentiate between different codes. Codes were

used to identify general patterns within and across each transcript. This step is an example of one of the five analytic techniques Yin (2009) described, which is that of explanation building. Merriam (2009) also described this process of analysis: "Assigning codes to pieces of data is the way you begin to construct categories. After working through the entire transcript in this manner, you go back over your marginal notes and comments (codes) and try to group those comments and notes that seem to go together" (p. 179). These codes were modified and revised as more text was examined in order to more accurately describe what was found that seemed important. Once the text was coded based on relevancy to my research concerns, I then examined the coded text to identify repeating ideas. Repeating ideas were identified within each transcript.

The coding software allowed me to conduct queries for collecting each repeating idea within each transcript. Repeating ideas were also identified across transcripts by conducting similar queries but ones that included multiple transcripts. Repeating ideas were categorized and came to represent factors that influenced teachers' technology self-efficacy. These categories were a result of patterns and regularities found in the data. According to Merriam (2009), "categories are conceptual elements that 'cover' or span many individual examples" (p. 181). Next, I reviewed each repeating idea and identified those ideas that appeared to have something in common with other repeating ideas. By grouping repeating ideas together and conducting queries of these grouped text segments, I was able to develop themes that represented ideas that were present across multiple transcripts. This process was similar to what Yin (2009) described in reference to explanation building, which he explained involves identifying ideas or details connected

to the theoretical proposition, comparing those ideas within a case and subsequently across cases in order to attempt to explain a phenomenon or "how" or "why" something happened. I then organized the coded data into separate files, each containing evidence for a specific category or theme, which was suggested by Merriam (2009). This technique is an example of what Yin (2009) described as "cross-case synthesis" which is useful when analyzing multiple cases. Yin (2009) further noted the importance of looking at each case individually as well as collectively when implementing the cross-case analysis technique. Stake (2009) further supported the need for cross-case analysis and explained that "researchers have an obligation to provide interpretation across the cases" (p. 39). In performing cross-case analysis, Stake (2009) also discussed that researchers not just concentrate on the similarities across cases but also pay attention to the differences, as those differences provide valuable information as well.

As a result of cross-case analysis, themes were identified, and themes were those bigger ideas that were pervasive across all three self-efficacy levels of participants. Additionally, differences between and among participants were examined by reviewing the coded transcripts of participants of the same technology self-efficacy level. These coded transcripts were explored in order to identify inconsistencies between or among the three participants at each level. According to Hatch (2002), data analysis is a systematic approach to finding meaning, and by analyzing the text in this way, I was able to see patterns, identify themes, discover similarities and differences, and make interpretations about the data.

I purchased coding software called MAXQDA to assist me in storing, managing,

organizing, and coding the interview and focus group transcripts. In relation to the literature that discusses the use of qualitative analysis software, both advantages and disadvantages have been identified. One disadvantage of using a software program, according to Auerbach and Silverstein (2003), is that the use of software distances you from the text, and you "lose the total immersion that comes from analyzing your text by hand" (p. 132). Other disadvantages include that the software cannot perform the thinking or analysis for you and depending on the functionality of the software, certain features may limit the type of analysis you wish to perform as well misguide your analysis as a result of predetermined software settings beyond your control (Rubin & Rubin, 2005). Although these disadvantages do exist and the literature varies on the usefulness of qualitative analysis software for analysis purposes, there is consistency in the literature about the usefulness of this software as a storage, organization, and management device (Auerbach & Silverstein 2003; Merriam, 2009; Rubin & Rubin, 2005). It should be noted that for purposes of this research study, the software served as a way to allow me to electronically store, better manage, and more efficiently organize data and not as a substitute for the researcher to perform actual analysis of the data.

Data triangulation. According to Ary et al, (2006), "The use of multiple sources of data, multiple observers, and/or multiple methods is referred to as triangulation" (p. 505). Using surveys, interviews, focus groups and document analysis increased the likelihood that the phenomenon under study was being understood from various points of view (Ary et al., 2006). Additionally, using multiple sources of evidence is one of the three principles of data collection as well as one of the major strengths of case study data

collection as identified by Yin (2009). Furthermore, using multiple sources of evidence in case studies "allows an investigator to address a broader range of historical and behavioral issues" (Yin, 2009, p. 115). Since this case study attempted to identify a variety of factors that may influence teachers' technology self-efficacy, the use of multiple sources aided in developing the holistic picture sought. Finally, it was essential that the results found in one data source resonated in more than one data source in order to lead me to findings that could be deemed credible. According to Stake (2006), this process helps in gaining assurances because each important interpretation needs to be supported by multiple sources of data.

Member checks. Member checks were used in order to validate that the main ideas from each participant were what they had intended on communicating. According to Stake (2006), "Member checking is a vital technique for field researchers. After gathering data and drafting a report, the researcher asks the main actor or interviewee to read it for accuracy and possible misinterpretations" (p. 37). Participants were provided with the opportunity to review a summary of their interview transcript. Participants were given the opportunity to provide feedback regarding the accuracy of their interview transcript. Additionally, participants were provided with a summary of themes found to have emerged from coding, and they were encouraged to provide feedback addressing any discrepancies.

Feedback. Feedback from an outside source that has experience with qualitative research was sought in order to validate the research findings. If I was the only one who saw certain themes emerging, then that may have indicated a discrepancy in my data

analysis which needed to be addressed. Feedback was conducted by providing the outside source with a summary of the themes found to have emerged from coding. These themes indicated factors found to have influence on participants' technology self-efficacy as well as revealed various relationships between and among those factors. Additionally, these themes helped identify any existing similarities and/or differences between and among participants at each technology self-efficacy level.

Trustworthiness

Trustworthiness refers to the credibility, dependability, and transferability of my research findings. Credibility and dependability for this study were addressed in multiple ways. First, through the collection of multiple sources of data, I was able to triangulate the findings to ensure that evidence collected from one source resonated or was confirmed in another source. According to Lincoln and Guba (2007), triangulation occurs when data are cross-checked by use of different sources. I also hired a professional transcriptionist to transcribe interviews and focus groups. Furthermore, member checks from participants and outside feedback from a research and evaluation specialist in the district were conducted as part of this study. Both member checks and peer feedback are appropriate techniques to address credibility (Lincoln & Guba, 2007). In terms of transferability, thick descriptions were provided that outlined data collection and data analysis procedures as well as specific detail about participant characteristics and the research setting making it possible for others to replicate this study if desired. The use of thick descriptions allows others wishing to apply all or part of the findings elsewhere the information they need to do so (Lincoln & Guba, 2007).

Ethical Considerations

In order to ensure confidentiality, all data were carefully collected, saved, and stored in well-secured locations. Electronic files were password protected, paper files were stored in a locked cabinet, and only I had password and key access to both locations. Additionally, pseudonyms were used in place of participants' real names. Participation in the study was strictly voluntary, and no one under my direct professional supervision was asked or expected to participate in the study. Participants signed a letter of informed consent (Appendix H), which outlined the nature of the study as well as possible risks posed by participating in the study.

CHAPTER FOUR: RESULTS

The purpose of this study was to identify factors that influenced teachers' technology self-efficacy. This study focused on three aspects: factors that influenced teachers' technology self-efficacy, relationships between identified factors and professional development, and similarities and differences between and among teachers at varying self-efficacy levels. To maintain confidentiality, pseudonyms were provided for each participant. A survey was initially used to quantify teachers' current levels of technology self-efficacy, and later interviews and focus groups were conducted to explore factors that influenced those levels. Finally, a document analysis was performed to determine what role, if any, local school professional development opportunities played that may have contributed to teachers' technology self-efficacy levels.

This chapter begins with a review of the research questions that guided this study. The participants' technology self-efficacy levels are discussed. Identified themes related to factors influencing technology self-efficacy levels are described, and connections between and among factors influencing technology self-efficacy levels and professional development opportunities are also addressed. The chapter concludes with a discussion of similarities and differences that existed between and among teachers at varying levels of technology self-efficacy.

Research Questions

The following questions guided this study:

Research question one. What factors affected teachers' levels of technology self-

efficacy? This primary research question was at the heart of the research study as the answer to this question has the power to inform educational institutions as to how they can target their resources in a purposeful way to produce positive, far-reaching outcomes (Henson, 2002). Current levels of teachers' technology self-efficacy were first identified through the CTI survey, and interviews and focus groups explored factors that influenced the levels identified by the survey results.

Research question two. How or in what way(s) were identified factors related to professional development opportunities regarding teachers' technology self-efficacy? Understanding how and in what ways identified factors related to professional development will be helpful in creating and delivering future professional development opportunities for educators that will enhance their skills for using technology in the classroom (Wang et al, 2004). This question was addressed through interviews, focus groups, and a document analysis of professional development materials from the three local school sites used for this study.

Research question three. What similarities and differences existed between and among teachers of varying technology self-efficacy levels? By identifying similarities and differences between and among teachers of varying technology self-efficacy levels, it becomes possible initially to better target those teachers who display particular characteristics so that they may either receive additional support early on or develop approaches to lead efforts to help others build their skills. Particularly identifying those teachers with high technology self-efficacy and enlisting their support to lead change efforts is a cost-effective way to leverage resources to enhance the skills of others (U.S.

Department of Education, 2010). To answer this question, themes are described that emerged as a result of coding interview and focus group transcripts.

Research Question One

All certified, full-time teachers from a local, elementary, middle and high school who participated had their technology self-efficacy levels determined through the CTI survey. This survey was a necessary first step in identifying factors influencing teachers' technology self-efficacy because the results provided information as to the current self-efficacy levels of participants, then making it possible to identify teachers at varying levels of self-efficacy. The nine participants were chosen as a result of their specific technology self-efficacy level and their willingness to participate in the study. Interviews were conducted face-to-face and audio recorded, then later transcribed for analysis and coding purposes. Interviews included participant demographic questions which served to provide information regarding the participant's teaching experience, the participant's perceived access to technology at home and at school, and the participant's experiences with technology outside of work. Other interview questions focused on the participant's comfort and interaction with instructional technology, attitudes and beliefs about technology, and training related to instructional technology. In some instances, structured interview questions and subsequently, the participants' responses led to additional clarifying questions not initially included.

Survey results. The survey link was forwarded by each principal to all full-time, certified teaching staff at the three site schools. The response rate for the high school was extremely low at 15%. The middle school response rate was the highest, at 38%, and the

elementary response rate was 30%. The total number of completed surveys was 54, and from that pool, nine participants were secured for the case study interviews and focus groups, three from each school. For purposes of quantifying survey results, each of the 21 survey items had five choices using a Likert scale, which were assigned point values ranging from 1 to 5. The following point values were assigned to each descriptor: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree. Participants' survey results were quantified into three categories using the aforementioned assigned point values: low-to-medium technology self-efficacy, with a point range of 22—72, medium-to-high technology self-efficacy, with a point range of 73—89, and very high technology self-efficacy with a point range of 90—105.

Of the 54 completed surveys, 14.8% of the respondents scored in the low-to-medium range, 53.7% of the respondents scored in the medium-to-high range, and 31.5% of the respondents scored in the very high range. Of the survey respondents, 79.6% were female, and 20.4% were male. 81.8% of male respondents scored in the very high range, 18.2% of male respondents scored in the medium-to-high range, and no male respondents scored in the low-to-medium range. 16.3% of female respondents scored in the very high range, 60.5% of female respondents scored in the medium-to-high range, and 23.2% of female respondents scored in the low-to-medium range.

Table 2 shows the overall survey results of all survey respondents in terms of what percentage of respondents scored at each self-efficacy level.

Table 2

Survey Results at Each Self-Efficacy Level

Self-Efficacy Level	Percentage of Survey Respondents Who Scored At Level
Low-to-Medium (22—72)	14.8
Medium-to-High (73—89)	53.7
Very High (90—105)	31.5

Table 3 shows the percentage of male and female survey respondents who scored at each self-efficacy level.

Table 3

Survey Results at Each Self-Efficacy by Gender

Self-Efficacy Level	Percentage of Female Respondents Who Scored At Level	Percentage of Male Respondents Who Scored At Level
Low-to-Medium (22—72)	23.2	0
Medium-to-High (73—89)	60.5	18.2
Very High (90—105)	16.3	81.8

Meet the Participants

John Walton. Out of a possible 105 points on the CTI survey, Mr. Walton strongly agreed with almost all of the 21 statements, earning a technology self-efficacy rating of 102 out of 105, which placed his score in the "very high" category. Mr. Walton

has taught at both the university and high school levels, with nine years of teaching experience. He currently teaches high school science, specifically physics.

At home, Mr. Walton has a wireless Internet connection, three computers, two iPads, three iPods (one of which belongs to his nine year old son), an iPhone, an iTablet, and wireless televisions that are auto-streamed, and wireless speakers. Mr. Walton has always played with the computer and considers himself a "dork" (John Walton, personal communication, September 23, 2011). Mr. Walton explained:

> When I was young, I always played with computers. One year I got a motorcycle and I asked for a computer instead, so we sold the motorcycle. And from there on, I basically just kind of grew up around computers, knew how to use them at an early age. (John Walton, personal communication, September 23, 2011)

Outside of work, Mr. Walton uses technology to play games, communicate with people, keep organized and relax. He has a calendar on his iPhone, which he updates through iTunes, and he keeps to-do lists and notes on his iPhone as well. He also regularly uses social networking, specifically Facebook.

George Phillips. Out of a possible 105 points on the CTI survey, Mr. Phillips earned a technology self-efficacy rating of 86 out of 105. Mr. Phillips' technology self-efficacy rating placed him in the "medium-to-high" category. Mr. Phillips has taught in both private and public school settings and at both middle and high school levels for six years. Mr. Phillips teaches high school social studies, specifically world geography and U.S. history.

At home, Mr. Phillips has a desktop computer and a MAC, and his family has an

iPad2 as well as two iPods. Mr. Phillips has a Smartphone (Blackberry), high definition televisions, a Blue-Ray, a Wii, and a DVR. In terms of personal entertainment, Mr. Phillips uses technology frequently for various purposes. Mr. Phillips explained, "I have a four-year old and a one-year old, so if we're out somewhere and my four-year-old is getting restless, I have a TV on my phone" (George Phillips, personal communication, September 30, 2011). Mr. Phillips also utilizes the GPS feature on his phone for travel directions, his family watches movies often on the weekends, his family listens to music, and he and his children play on the iPad. Mr. Phillips also shops online, social networks, and conducts both informal and formal research using the Internet.

With regard to formal research, Mr. Phillips is currently working on earning a doctoral degree, with several of his courses being online or having online components, and a course he is currently enrolled in focuses on Internet for educators, and this course explores how to utilize technology in instruction. Mr. Phillips finds enjoyment in using technology outside of work. In reference to why he enjoys technology, Mr. Phillips explained:

> I think the amount of information. I very rarely get frustrated trying to find something. I would say ease…And I like knowing things; like I said, I'm curious and I like knowing things, so the Internet specifically or these vehicles to get to the Internet provide me with an opportunity to sort of satisfy my thirst for knowledge. (George Phillips, personal communication, September 30, 2011)

Alice Stanson. Out of a possible 105 points on the CTI survey, Mrs. Stanson earned a technology self-efficacy rating of 59 out of 105. Mrs. Stanson's technology self-

efficacy rating placed her in the "low-to-medium" category. Mrs. Stanson has taught in the public school setting at the high school level for four years. Mrs. Stanson teaches high school language arts, specifically freshman language arts.

At home, Mrs. Stanson mostly uses her home computer but sometimes brings home her school computer because it is faster. She also has a cell phone, a television and a PlayStation 3. Mrs. Stanson uses her computer for checking her emails, social networking, and graduate school as she is currently pursuing her Master's degree through an online design. Mrs. Stanson uses her cell phone for frequent communication through calling and texting family and friends. In response to whether or not she enjoys using technology outside of work, Mrs. Stanson explained, "Yes. For the most part, until I started my Master's I didn't bring my computer home as often" (Alice Stanson, personal communication, September 21, 2011).

Ryan Ferris. Out of a possible 105 points on the CTI survey, Mr. Ferris earned a technology self-efficacy rating of 100 out of 105. Mr. Ferris's technology self-efficacy rating placed him in the "very high" category. Mr. Ferris has taught in both private and public school settings at the middle school level for 15 years. Mr. Ferris teaches middle school mathematics, specifically accelerated sixth and seventh grade mathematics.

At home, Mr. Ferris has a high definition flat screen television, a Dell laptop, and a cell phone; however, the cell phone is not a Smartphone. Mr. Ferris mostly uses his cell phone for communicating through calling or texting, and he uses his laptop for emailing, banking, selling, and maintaining his website, which he created for free through Google. Additionally, Mr. Ferris used technology to obtain his gifted certification three years ago,

and was part of a net-based mathematics and leadership education cohort six years ago. In response to whether or not he enjoys using technology outside of work, Mr. Ferris stated, “I guess, yeah, I mean I do use technology when I feel like I need to. I don't feel like I'm a technology nut” (Ryan Ferris, personal communication, October 10, 2011).

Sarah Duvall. Out of a possible 105 points on the CTI survey, Mrs. Duvall earned a technology self-efficacy rating of 84 out of 105. Mrs. Duvall’s technology self-efficacy rating placed her in the “medium-to-high” category. Mrs. Duvall has taught in the public school setting at the elementary and middle school levels for 21 years. Mrs. Duvall currently serves as the media specialist at a middle school, although she previously taught language arts and special education.

At home, Mrs. Duvall and her family use both desktop and laptop computers which have wireless connectivity, digital cameras, iPhones, iTouches, iPods, PlayStation, Wii, Netflix, and a television and a DVR. Mrs. Duvall makes use of technology in order to create online scrapbooks, create family videos, download and listen to music, retrieve travel directions through Google maps, shop online, download books, email, and for social networking. Mrs. Duvall also obtained her gifted certification online and obtained her specialist degree in instructional technology through a hybrid online program,. Mrs. Duvall enjoys technology because of the ease of communication it allows (Sarah Duvall, personal communication, October 7, 2011).

Lisa Patterson. Out of a possible 105 points on the CTI survey, Mrs. Patterson earned a technology self-efficacy rating of 72 out of 105. Mrs. Patterson’s technology self-efficacy rating placed her in the “low-to-medium” category. Mrs. Patterson has

taught in the public school setting at the middle school level for two years. Mrs. Patterson currently teaches public speaking and student leadership.

At home, Mrs. Patterson and her husband have laptops, digital cameras, iPods, a Kindle, an X-Box, a few televisions, and cell phones; however, they do not have Smartphones. Mrs. Patterson currently uses technology to work toward earning her Master's degree online, watch YouTube videos, watch movies through Netflix, email and create and share Google docs, read the news, blog, social network, and communicate on her cell phone, although she does not have a texting feature. Mrs. Patterson enjoys using technology outside of work because it is convenient (Lisa Patterson, personal communication, October 12, 2011).

Marsha Taylor. Out of a possible 105 points on the CTI survey, Mrs. Taylor earned a technology self-efficacy rating of 103 out of 105. Mrs. Taylor's technology self-efficacy rating placed her in the "very high" category. Mrs. Taylor has taught in both private and public school settings at the elementary level for 13 years. Mrs. Taylor teaches first grade, specifically students receiving special education services.

At home, Mrs. Taylor and her family share both laptop and desktop computers, all types of gaming systems, iPads, iPods, an iTouch, iPhones, as well as several televisions with sound systems and DVRs. Mrs. Taylor's husband is a computer programmer. She explained the effect he has on her in regards to technology:

> We are trying to keep up with 21st-century skills, and it just seems like that is the way society is headed. And so, my husband is always there to fall back on and to teach myself and my children the latest and greatest technology, so we are always

> feeling like we are moving with the times. So that's why we're constantly updating and upgrading what we have. And so, I've gotten a lot of background knowledge just through my husband, as far as knowing how to use the different types of devices. (Marsha Taylor, personal communication, October 13, 2011)

Mrs. Taylor regularly uses technology outside of work for leisure purposes, researching, purchasing items online, banking, communicating with family through webcams, emailing, and social networking. Mrs. Taylor enjoys using technology outside of work because "It's easy. It's a lot faster than actually doing hand-paper-and-pencil work. And because it's something that we're so involved in with our family, it just comes naturally" (Marsha Taylor, personal communication, October 13, 2011).

Ashley Bolden. Out of a possible 105 points on the CTI survey, Mrs. Bolden earned a technology self-efficacy rating of 85 out of 105. Mrs. Bolden's technology self-efficacy rating placed her in the "medium-to-high" category. Mrs. Bolden has taught in the public school setting at the elementary school level for five years. Mrs. Bolden currently teaches third grade.

At home, Mrs. Bolden and her husband each have a laptop and share a desktop computer. Additionally, they each have an iPod and an iPhone while they share an iPad, a few high definition televisions, a DVR, and a DVD player. Mrs. Bolden regularly uses technology outside of work for graduate school purposes, specifically submitting her work online and researching course content, and she is currently working toward earning her gifted certification online as well. Although Mrs. Bolden just created an account this summer, she regularly uses Facebook for social networking purposes, and she uses

technology to communicate in terms of emailing, calling, and texting. Mrs. Bolden shops, banks and plays games online. Mrs. Bolden enjoys using technology because "It's easy…the convenience of technology is why I like it" (Ashley Bolden, personal communication, October 13, 2011).

Beverly Sims. Out of a possible 105 points on the CTI survey, Mrs. Sims earned a technology self-efficacy rating of 68 out of 105. Mrs. Sims' technology self-efficacy rating placed her in the "low-to-medium" category. Mrs. Sims has taught in both private and public school settings at the elementary level for 25 years. Mrs. Sims currently teaches kindergarten.

At home, Mrs. Sims and her husband share an Apple computer, an iPad, and iPod. She has her own iPhone, and her family has several televisions as well. Mrs. Sims regularly uses technology in a variety of ways outside of work: email, Facebook, GPS, play games, check stocks online, banking, online recipes, download music, download applications, take pictures, check the weather, and calendar and to do lists. Mrs. Sims enjoys using technology outside of work because of the ease and convenience it allows:

> Well, like, for my calendar, it's a whole lot easier to just type it in, and it's there and it's with me all the time, than having to do one of those little old calendars we used to do; and it's another thing to carry around in your pocketbook and you might forget to write something down – and, like, this one sends me reminders and stuff. You could never do that with a calendar. And I'm not a real good letter writer, so it's a whole lot easier for me to shoot people an email than to send them a letter or to text them. I'm not a real big telephone talker, so, like, if I want to

> tell my daughter something, I'll send her a text now instead of calling her, because I just don't like talking on the phone. (Beverly Sims, personal communication, October 17, 2011)

Table 4 provides a summary of participants' characteristics with a breakdown of gender, age, instructional level, years of teaching experience and technology self-efficacy rating.

Table 4

Participant Characteristics

Participant	Gender	Age	Instructional Level	Years of Teaching Experience	Technology Self-Efficacy Rating
Marsha Taylor	Female	37	Elementary	13	103
Ashley Bolden	Female	27	Elementary	5	85
Beverly Sims	Female	53	Elementary	24	68
Ryan Ferris	Male	38	Middle	15	100
Sarah Duvall	Female	44	Middle	21	84
Lisa Patterson	Female	24	Middle	2	72
John Walton	Male	32	High	9	102
George Phillips	Male	34	High	6	86
Alice Stanton	Female	26	High	4	59

Factors That Influenced Technology Self-Efficacy Levels

Both the personal interviews and focus groups served to explore factors that influenced the teachers' technology self-efficacy levels. After personal interviews and focus groups were conducted, through the use of qualitative coding MAXQDA software,

interview and focus group transcripts were coded to search for factors that influenced participants' technology self-efficacy levels. Open coding was performed on each personal interview transcript and each focus group transcript. Open coding allowed for additional codes to be added or revised along the way as additional ideas and themes were identified or developed. Of the factors identified as a result of coding, they can be split into two major categories: work-related factors and personal/outside factors. Once coding was complete and themes had been identified, outside feedback was performed by asking one colleague from my district's research and evaluation department to review a summary of coded segments to validate that the themes identified were satisfactory.

Work-related factors. Factors presented in this section represent work-related factors identified as a result of at least one of the nine participants' responses in the study. Later, in a discussion of research question three, similarities and differences between and among teachers of varying technology self-efficacy levels, work-related factors found to be common among multiple participants at all three levels will be more explicitly addressed, as will discrepancies among participants' responses.

Teachers' perceptions of local school support for instructional technology was one factor identified. Local school support for technology includes support between and among teachers to collaborate and assist each other with technology, support from local school technology specialists, and even support from local school leadership and administration in terms of promoting the use of more instructional technology and making it a school initiative. In his personal interview, (Ryan Ferris, personal communication, October 10, 2011), Mr. Ferris, who had very high technology self-

efficacy, stated:

> We have a great technology team. They're always open to new ideas…And so when you have somebody who's willing to try something new…is an example of having a technology team that's willing to kind of, you know, try something new, even if it's only for one person, and support you and be willing to help you work through the pitfalls, and I think that's really good.

A second work-related factor was knowledge of which instructional technology tools were available Mrs. Patterson, in her personal interview stated:

> I feel like sometimes, especially this was true last year, as a first year teacher, I didn't always know what resources were available. You know, sometimes I wish that we just, I don't know, had a list somewhere of these are all the things you can do. (Lisa Patterson, personal communication, October 12, 2011)

Another work-related factor identified was a teacher's content area focus and how a teacher believed technology helped make the content more accessible. For example, Mr. Walton teaches high school physics, and stated, "Physics is kind of, you know, an out there subject, and so when you can show how the concepts we talk about relate to everyday things, it [technology] kind of bridges that gap, especially for your lower level students" (John Walton, personal communication, September 23, 2011).

Additionally, the amount of time teachers used instructional technology during the regular work day was an identified factor. For example, one teacher with very high technology self-efficacy stated, "I do everything on the Smart Board…I'm either using the Smart Board that's already linked to my notes on the computer or using the notebook

that came with it to do problems on the board…so, eight hours a day" (John Walton, personal communication, September 23, 2011). Another teacher, with medium-to-high technology self-efficacy did not use instructional technology as often: "I mean, on average, probably half the time, so what is that, three-and-a-half hours?" (George Phillips, personal communication, September 30, 2011).

A final work-related factor that was identified as influencing teachers' technology self-efficacy was teachers' beliefs about available opportunities to learn about instructional technology though work avenues, either at the local or district level. Mr. Walton, the high school teacher with very high technology self-efficacy, in reference to his belief about available opportunities to learn about instructional technology stated, "Yeah, I think there is a lot that is offered. I just don't think a lot of people take advantage of it" (John Walton, September 23, 2011).

Personal/outside factors. Factors presented in this section represent personal or outside factors identified by at least one of the nine participants in the study. Later, in a discussion of research question three, similarities and differences between and among teachers' of varying technology self-efficacy levels, personal/outside factors found to be common among multiple participants at all levels will be more explicitly addressed, as will discrepancies among participants' responses.

Teachers' perceived personality traits were factors that influenced teachers' technology self-efficacy. The personality traits identified as a result of the interviews were being innovative, being a risk-taker, and being persistent. Mrs. Taylor, who had very high technology self-efficacy, believed she is innovative:

> Yes, I would think so. I'm constantly making new lessons of my own, especially since my children are not always up to par with the rest of first grade, so mine will need to be much different than everyone else's. So a lot of times I will maybe get an idea from what [others] are doing but then will adapt it and kind of even sometimes go my own way with it and come up with a whole new lesson plan type thing. (Marsha Taylor, personal communication, October 13, 2011)

Risk-taking was another personality trait that was identified as when Mr. Walton stated:

> Outside of the class, I'm a risk-taker. Yeah, I am. I am. I'm not a big preparer often. No matter what I'm doing, I just kind of fly off the hip and everything normally goes alright. And so, yeah, I would say I take risks in my career and outside. You know, that's just kind of the way my personality is. (John Walton, personal communication, September 23, 2011)

Persistence, for purposes of this study, refers to taking the time to figure things out or problem solve when using technology. Mr. Ferris explained how he troubleshoots when using instructional technology. He stated, "You've just got to press buttons and see what happens, and you know, try out a lesson. And if it doesn't work, then you've got to figure out how to make it work" (Ryan Ferris, personal communication, October 10, 2011).

Another personal factor that influenced teachers' technology self-efficacy was teachers' home access to technology and/or personal time to learn how to use the technology accessible to them at home. Mr. Phillips, from the medium-high technology

self-efficacy level, stated, “I like to try new things, but I think right now, my concentration is so much more on things I am asked to do that I’m not likely to look on my own when I have free time” (George Phillips, personal communication, September 30, 2011). Families also influenced teachers’ technology self-efficacy as evidenced by Mrs. Taylor’s statement, “I’ve gotten a lot of background knowledge just through my husband as far as knowing how to use the different types of devices” (Marsha Taylor, personal communication, October 13, 2011).

Teachers’ attitudes toward technology, for purposes of this study, included the value teachers place on technology’s importance in education today and in society in general for future success, as well as the perceived ease and convenience of technology. Mr. Walton saw technology as an instructional tool that “definitely enhances the student’s learning” (John Walton, personal communication, September 23, 2011). Mrs. Stanson believed technology to be very important in education and for students’ future success: “Well, that’s what we’re doing in high school is trying to prepare them for the future, and so technology is being used in the future in the work fields, so we need to get them used to using it” (Alice Stanson, personal communication, September 21, 2011). The perceived ease and convenience of technology also influenced a person’s attitude toward technology: “It’s easy. I mean when I first got a cell phone, I used it for only emergencies, but now I use it for way more…the convenience of technology is why I like it” (Ashley Bolden, personal communication, October 17, 2011).

Finally, personal fears teachers had toward instructional technology, in some cases, influenced their technology self-efficacy. Being fearful of instructional technology

contributed to some participants' decisions to use it in their instruction. These fears included the technology not working, the technology breaking, the students misusing the technology, and lacking expert knowledge of the technology and not being able to fix it quickly so as to not ruin a lesson. In her personal interview (Ashley Bolden, personal communication, October 17, 2011), Mrs. Bolden stated:

> I cannot stand when [technology] doesn't work. I always tell my kids, 'I have no patience for this.' So when something doesn't work…and I would say that is the biggest turn away for teachers. When something doesn't work, when you've spent time creating something and it doesn't work, it's frustrating.

Research Question Two

The second research question addressed how or in what way(s) identified factors were related to professional development opportunities that addressed technology. Connections were made between work-related factors that were identified through open coding of the transcripts and professional development. Also, the personal interviews included questions that specifically addressed the amount and types of training in which teachers had previously participated that focused on instructional technology. Professional development documents from each of the three schools were then analyzed to verify previous and existing professional development opportunities, and finally, teachers were asked to describe how or what type of future professional development opportunities could help increase their technology self-efficacy levels.

Work-related factors connected to professional development. Teachers' beliefs about existing professional development opportunities to enhance their skills with

instructional technology, teachers' beliefs about available work time to learn or practice instructional technology, and teachers' perceptions of local school support for instructional technology were three work-related factors connected to professional development. In her personal interview (Alice Stanson, personal communication, September 21, 2011), Mrs. Stanson described her feelings about available professional development opportunities at her local school, "Yeah, the opportunities are there. Our school does a good job of providing lots of different opportunities for lots of different professional development." Several other participants shared this same belief and felt that multiple opportunities to learn about instructional technology are offered, but in the case of Mr. Ferris, someone who has very high technology self-efficacy, these offerings are not always what they need to be:

> If I want to learn something from the beginning, there's probably opportunities, but if I already know, if I feel like I'm comfortable with that, like if there's a Smart Board class out there, it's probably a basic level Smart Board class. So to like go to the next thing, it would probably mean going out of town or waiting for some event. (Ryan Ferris, personal communication, October 10, 2011)

Time to learn or practice instructional technology during regular work hours was another factor identified by several participants. This time could be structured, as in offered through professional development opportunities, or unstructured, as in teachers' planning time each day. In her personal interview (Lisa Patterson, personal communication, October 12, 2011), Mrs. Patterson explained her reasons for not attending existing professional development opportunities, "It's like, okay, yes, but when

do I have time to actually do that." Mrs. Duvall shared a similar sentiment in her personal interview:

> We've had great workshops, but they're typically during planning, in the morning, or after school, and so you don't…it's the same teachers who go who are willing to put aside their work, and so it's the same teachers who go to them, and it's a very small number. (Sarah Duvall, personal communication, October 7, 2011)

Some participants also felt it was hard to find time to learn or practice as a result of being pulled in different directions for other work-related items. As Mr. Ferris stated, "I am really guilty of, the problem is, this is the problem. You've got your teaching, right, and then I find myself pulled into a lot of other things" (Ryan Ferris, personal communication, October 10, 2011).

With regard to local school support for instructional technology, several participants described how their local school supports the use of instructional technology, in one way or another. In his personal interview (George Phillips, personal communication, September 30, 2011), Mr. Phillips explained:

> We have something called Tech Tuesdays which allows people to work on something technological just to learn. My department head is always sending out things to help us, websites and links and that sort of thing. Every time I have come in to see the LSTC or emailed him, his response has been instantaneous. And our other two, who I guess are tech support and not really educational tech, they have been very easy to work with as well.

One of the participants felt very strongly that her local school leadership team and school community worked together to support the use of instructional technology. Mrs. Bolden stated in her personal interview, "I believe that our administration 100% believes in the power of technology, and so they continue to find new ways to get things for the school…And our PTA supports it too, financially" (Ashley Bolden, personal communication, October 13, 2011).

Participants' previous training and experiences connected to instructional technology. Participants' previous training and experiences could include formal training through professional development or an educational institution, or it could be informal, done on their own time, and it may or may not have been related to their current teaching situation. For example, Mr. Walton previously taught at the university level where he was exposed to different types of technology:

> I would say that at the University of Florida, when I taught there, we had four projector screens that would roll with classroom clicker systems that integrated straight into grade books, and so literally you could do instantaneous feedback that would show student learning. (John Walton, personal communication, September 23, 2011)

Additionally, other participants explained that they had taken graduate classes that either focused on integrating technology or had a required online component. Mr. Phillips explained, "Right now, I'm taking a class that's called Internet for Educators. It's like an 8000 level class, and it is all online. We didn't even have a face-to-face the first meeting we had. It's all through Elluminate" (George Phillips, personal communication,

September 30, 2011).

Some participants had not only participated in training that focused on instructional technology, but had also facilitated training that focused on instructional technology at their local schools or beyond. As Mr. Ferris stated in his personal interview, "I've taught staff development for years, and I've taught staff development with other people" (Ryan Ferris, personal communication, October 10, 2011). Mrs. Bolden previously led staff development opportunities at her school as well:

> But so first I was a participant and then I was, I guess, an instructional, I don't know, a coach, a leader, whatever you want to call it, of staff development, and last year our teachers got to choose what staff development they wanted to attend. The technology class that I taught was one of them. (Ashley Bolden, personal communication, October 13, 2011)

Several participants explained in their personal interviews and again in the focus groups that they attended local school opportunities that focused on instructional technology, but the amount of opportunities they attended differed among many of them.

Amount, availability and types of previous and current professional development opportunities. The professional development documents collected from each of the three schools confirmed that all three schools were currently offering and had previously offered professional development opportunities connected to instructional technology. These documents were consistent with what participants said in terms of a variety of offerings being available, the offerings occurring during teachers' planning periods or before or after school, and teachers usually having choices as to which

professional development opportunities they attended. All three schools' professional development opportunities were presented in a "menu" style, as they offered a variety of sessions for teachers to choose from, with some of those choices having a focus on instructional technology while others did not. In her personal interview (Beverly Sims, personal communication, October 17, 2011), Mrs. Sims stated, "We do staff development and this time there were, like, five different options to choose from, and one of them was to do a tech class."

Very few of the professional development opportunities focused on instructional technology offered at each of the three schools required mandatory attendance. Additionally, of the instructional technology offerings, several were "one-time only" opportunities that focused on an introduction to the basics of particular instructional technology tools, and very few follow-up classes were offered to build on the basics. Mrs. Stanson stated in her personal interview, "As far as training goes, most of the time you have one class period, so 55 minutes. They can go over the basics, but they cannot go through every possible scenario" (Alice Stanson, personal communication, September 21, 2011).

Ideas for future professional development opportunities to increase teachers' technology self-efficacy levels. In each of the three focus groups, participants were asked to identify ways in which their current technology self-efficacy levels could be increased. Additionally, in several instances during the personal interviews, participants shared ideas that could help increase their technology self-efficacy levels. Among the ideas identified were (a) more targeted and specialized teacher training on instructional

technology, (b) increased knowledge of and access to instructional technology tools and resources, (c) increased teacher collaboration, and d) opportunities for teacher observations/demonstrations. The first idea, more targeted and specialized teacher training on instructional technology, refers to training offered that targets the varying levels of teachers' technology abilities, for example basic, intermediate, and advanced level trainings. In her focus group (Alice Stanson, personal communication, November 7, 2011), Mrs. Stanson stated, "You almost need more time with Movie Maker to really explain all the stuff you could do with it, and so maybe offer more in-depth."

Additionally, according to several of the participants, teachers want the training to be less theory, and more application based as Mr. Phillips stated, "I think it's practical application. I really love theory, but I need more practice. I need more people to say, 'You can do this'" (George Phillips, personal communication, November 7, 2011). Mr. Walton added to this idea by saying, "It has to be something that's translatable" (John Walton, personal communication, November 7, 2011). To build on this first idea of more targeted and specialized teacher training, Mrs. Bolden shared how previous training has enhanced her skills, emphasizing the importance of the training lasting over an extended period of time and building on itself:

> That class was once a month for a year. Every time we went, we had to practice something, do something and bring it back, so it wasn't just sitting there and watching somebody else use it. You actually had to practice. They wanted you to use it in your classroom, which I'll be real honest, once you start using [Mimeo], you want to use it in your classroom. (Ashley Bolden, personal communication,

November 9, 2011)

Still, another component of this first idea involves finding different ways and times to offer the workshops as well as making the workshops required. Several participants shared the feeling that trainings need to be either job-embedded, structured into the regular work day, or offered at a time outside of regular work hours when teachers could be compensated for attending the trainings. In terms of job-embedded training, participants felt current job-embedded offerings would need to be extended in length of time in order to allow more time to practice using the instructional technology. Mrs. Patterson stated:

> In order to actually sit down and figure out a technology, you need more than 30 minutes of time. I feel like if I'm actually going to try and dig into this and figure it out, I need an extended period of time. (Lisa Patterson, personal communication, October 12, 2011)

Paying teachers for their time to train was an idea presented in the middle school focus group by Mrs. Duvall:

> If they had money dedicated to where over the summer they could pay for teachers to go through training for an extended period of time, what they make us do is come in early, do 45 minutes before school, give up your planning, and that's not going to be quality. It's got to be outside of instructional times when teachers can really focus on it. And they're going to have to start investing, if they want teachers to become better teachers, they've got to start investing in that and doing more training over the summer. And that means paying the teachers to do

that, too. (Sarah Duvall, personal communication, November 10, 2011)

The next idea participants identified as an aspect that would help increase their technology self-efficacy levels was increased knowledge of and access to instructional technology tools and resources. Some participants were not aware of all of the resources available to them, so they have been limited in what they use in their instruction. In her personal interview (Beverly Sims, personal communication, October 17, 2011), Mrs. Sims stated, "more knowledge of what's out there that I could experiment with" as something that would help her to learn more. Mrs. Patterson echoed a similar statement in her interview, "I didn't always know what resources were available…I just wish there was a list of this is what we have" (Lisa Patterson, personal communication, October 12, 2011).

Beyond increased knowledge of equipment and resources, some participants explained the need for increased access to the equipment and resources in order to have the chance to practice using them. In her personal interview (Sarah Duvall, personal communication, October 13, 2011), Mrs. Duvall stated, "That's why I feel like the teachers, it does no good to give them staff development if they don't have the equipment to practice." Mr. Walton, in his focus group, expressed his concern with a lack of available equipment that could be used to integrate technology, "There's a lot of stuff I've used before, you know, that I think would be really great and would really make a difference. But, you know, that is if someone invests that type of money" (John Walton, personal communication, November 7, 2011).

A third idea identified by participants was that of increasing teacher collaboration.

Several participants named teacher collaboration as a vehicle to learn more about how to use instructional technology. In his personal interview (Ryan Ferris, personal communication, October 10, 2011), Mr. Ferris shared his idea for helping others: "I also think I could, you know, maybe tell the story of how I came to use [technology] and learned to love using it, and encourage and inspire other people who don't use it to try some new things." Mrs. Sims stated something similar in her personal interview, "Teachers could really benefit from more time during the day to have technology, or more of a collaborative atmosphere" (Beverly Sims, personal communication, October 17, 2011). Another participant, Mrs. Duvall explained, "The more teachers you have that get better at technology and can serve as mentors to other teachers, but then troubleshoot for them, it gets easier when you have the person next to you who can help you too" (Sarah Duvall, personal communication, October 7, 2011).

Teacher observations and demonstrations were a fourth idea identified by several participants as a way to help build teachers' technology self-efficacy. As she explained how she learned to use the Mimeo, Mrs. Bolden stated, "We were the only ones with the Mimeo and we went around to schools that had them and observed like what they did with instruction to use them, and then it just became my thing" (Ashley Bolden, personal communication, October 13, 2011). In his focus group, Mr. Ferris described his idea in regards to teacher observations and demonstrations:

> What I was thinking was having a way to use technology to either video or to Smart Board, record or do whatever to allow a bank of lessons or some type of access so that teachers can see other teachers teaching. If we can't do it

> physically, if we can't be in the room because of the lack of subs or whatever, but we can watch each other and we can learn from each other. (Ryan Ferris, personal communication, November 10, 2011)

Research Question Three

The third and final research question addressed the similarities and differences that existed between and among teachers of varying technology self-efficacy levels. Factors, both work-related and personal, were identified through open coding of the transcripts and then compared between and among participants of varying technology self-efficacy levels in order to identify common themes, or those factors that were shared by multiple participants across all three technology self-efficacy levels. These common themes are important because they carry leverage across technology self-efficacy levels and support that certain factors may have more of an influence than others in terms of affecting technology self-efficacy. Additionally, any discrepancies among participants of the same technology self-efficacy level are described, as it was important to identify any outliers.

Common Themes

When analyzing and coding the personal interview and focus group transcripts, common themes developed among participants, regardless of their technology self-efficacy level. In this section, themes shared by multiple participants across technology self-efficacy levels are described.

Lack of time. By far, the most resounding theme identified throughout all of the interviews and focus groups was the aspect of time. All of the participants shared a belief

that there was never enough time to learn and practice using the instructional technology available to them. Whether the participants had low-to-medium, medium-to-high, or very high technology self-efficacy levels, they believed more time was needed in order to further develop their skills in the area of instructional technology. Participants agreed that they lacked the time both at work and at home to build their knowledge of resources and practice using a variety of technology tools. Although some participants' reasons for lacking the time at home may have differed, all felt they lacked adequate time at work due to the current structure and demands of their work days.

Some participants lacked time at home or outside of regular work hours due to graduate school or other types of educational advancement course commitments, familial obligations, coaching responsibilities, or a combination of two or more of these. Mrs. Stanson stated:

> I hate to always use coaching, but being in season immediately after school I'm in charge of 30 more kids for two-and-a-half more hours. And then now I'm getting another degree, so you know, I might have to go home and do more stuff. (Alice Stanson, personal communication, September 21, 2011)

In her personal interview (Ashley Bolden, personal communication, October 13, 2011), Mrs. Bolden expressed a similar sentiment:

> With the Gifted Endorsement and being a new teacher to a new grade level, I just could not offer up the time…I'm always, always, always…my plate is always full, and I just couldn't put one more thing on it this year. I couldn't do it.
>
> In regards to lacking work time to learn and practice using instructional

technology, several participants shared their belief that, with the way the school day is currently structured and the amount of work they are already expected to do, there is not room to make time to learn about instructional technology. Mr. Walton, in his response to whether or not he had enough time in the work day to learn about instructional technology, said, "No, you don't, no. If you're viewing it from the normal teacher's standpoint, having taught them, no; there is no way that there's enough time in the day" (John Walton, personal communication, September 23, 2011). In his personal interview, Mr. Phillips explained all of the things he feels he needs to focus on during his daily planning that keep him from doing other things, "I have [stuff] to do during planning, and I owe it to my students to make sure I get their grades in to prepare for tomorrow's lesson or whatever else" (George Phillips, personal communication, September 30, 2011). While Mr. Walton and Mr. Phillips represent some of the high school perspective on this matter, the feelings of frustration did not differ at the middle school or elementary level, according to the participants' responses. For example, in her personal interview (Lisa Patterson, personal communication, October 12, 2011), Mrs. Patterson, a middle school teacher, stated:

> I think, well, just between all the responsibilities of any teacher, it's hard to sit down…we have a lot of other like tutoring responsibilities or working with special education classes or things like that. So even any break and planning that we do have, I feel like a lot of times it's taken up with other things.

At the elementary level, teachers experience a very similar scenario, as all three elementary participants shared their feelings about the lack of available work time to

learn instructional technology due to the current teaching demands placed on them. In her personal interview (Beverly Sims, personal communication, October 17, 2011), Mrs. Sims stated:

> So other than lunch…and then we have a very short planning time, and by the time you go to the bathroom and come back and check your email and maybe look at their homework, or…I mean, your time is gone, so there's not enough time.

Mrs. Bolden stated, "You have to spend every minute with the kids in order to have an effective day" (Ashley Bolden, personal communication, October 13, 2011). Mrs. Taylor's frustration dealt with the amount of material teachers are required to teach and how that directly affects the amount of available time they have to do other things, like learn about technology:

> We're required to teach so much content. And during that time, we're either teaching or we're preparing to teach those lessons that we need to get in, and so to actually learn something new about a new product during the school day, I just don't feel like we have that time. It's not available to us. I wish it were, but usually we find that it's after hours. (Marsha Taylor, personal communication, October 13, 2011)

Teachers' beliefs about available learning opportunities. Another common factor identified across the three different technology self-efficacy levels was teachers' beliefs about available professional development opportunities to learn about instructional technology. Regardless of grade level, subject area, or self-efficacy level,

participants shared the similar feeling that while there were opportunities available, the majority of current professional development opportunities targeting instructional technology were either not offered at a time convenient for teachers, or in many cases, were structured in a way that was not conducive to effectively developing teachers' specific technology skills.

Several participants shared that opportunities were offered during teachers' planning periods or directly before or after school. Regardless of the school level, whether elementary, middle, or high school, the average amount of planning time for the nine teachers was reported as less than one hour. Participants believed that in most cases although this allotted amount of time was adequate to learn the basics of a given instructional technology tool or resource, it was not enough time for teachers to then practice using the tool or resource to the point where they felt confident enough to then go back to their classrooms and integrate it. In her personal interview (Alice Stanson, personal communication, September 21, 2011), Mrs. Stanson explained:

> As far as training goes most of the time you have one class period, so 55 minutes. They can go over the basics. They can go over, you know, but they cannot go through every possible scenario…So you can give me all the handouts you want, but until I've actually had to do it and produce something…

Teachers' attitudes toward technology. Participants' attitudes toward technology were similar across all three self-efficacy levels. All participants shared overall positive attitudes toward technology and also held similar beliefs that technology was a great way to engage students, that it was relevant to today's students, and that

students would need to be technologically literate in order to be successful later in life. There was a shared belief among the participants that technology was a tool that could be used to engage students. Some participants were purposeful to state that technology was not a silver bullet and could not be effectively integrated without first being an effective teacher, but all did express multiple reasons for technology being a vehicle that could promote student engagement.

Several of the participants agreed that technology could make learning more interactive and involve students more through activities that were hands-on, self-paced, and included visual and audio effects. In her personal interview (Lisa Patterson, personal communication, October 12, 2011), Mrs. Patterson stated:

> I think just the nature of technology generally gets them up and moving, giving them a new scene, whether you're taking them into the computer lab to do research or something. Just giving them a new scene sometimes gets their mind working in ways that they wouldn't just in the regular classroom. I think they just like it more.

Mrs. Taylor, the elementary special education teacher, believed technology engaged students more because of the flexibility it allowed to differentiate learning: "You can cater it to the actual child. If they are an auditory learner, then you can make your program fit them. Or, if they are a visual learner, you can change your program to fit that child" (Marsha Taylor, personal communication, October 13, 2011).

Beyond technology offering more opportunities to engage students, all of the participants agreed that technology was important to integrate into instruction because it

is what is relevant to today's students. In her personal interview, Mrs. Stanson stated, "I've been able to be more relevant to the kids by using YouTube and Skype" (Alice Stanson, personal communication, September 21, 2011). Mrs. Duvall explained that students use technology as part of their everyday lives, and we have to "recognize the kids right now, I mean, they're used to electronics. They have a hard time sitting still" (Sarah Duvall, personal communication, October 7, 2011). Just as Mrs. Duvall explained, several of other the participants also recognized that technology was what today's students were comfortable with and know well. In his personal interview (Ryan Ferris, personal communication, October 10, 2011), Mr. Ferris stated:

> I kind of feel like it's the 21st century, the kids live and breathe technology in their lives even if I don't. So, I feel like I need to have it incorporated into class and remember that they're living in that world, and I need to bring this world into their world. So, if I teach math class like it's the '50s, I'm going to lose them all. So, I feel like making sure that it's a part of the class every day is important because technology is part of their world every day.

Mr. Ferris went on to discuss one of the problems he sees with education these days: "Kids come to school every day, and they have no idea how the next seven hours are going to relate to the rest of their lives."

In a discussion surrounding the importance of students being well versed in technology in order to achieve future success, all participants' beliefs were aligned. The participants expressed a sense of urgency to move our students further along the continuum of becoming technologically literate as well as the need for teachers and

students to adapt to the world in which they are now living and must work to stay competitive in a global market. In his personal interview (John Walton, personal communication, September 23, 2011), Mr. Walton stated, "For us to have a successful education system, students have to be integrated with technology." He went on to discuss how, in his own doctoral research, he learned that, "In 1964 or 1965, the United States was the number one leader in mathematical and science instruction in the world. Last year, actually, 2009, we fell to 17th globally, and we continue to fall." He believed the main reason for this occurrence was that "either other countries have out-distanced us in terms of students, which shouldn't be the case, or their curriculum is more focused on instruction based upon technology integration, and we're getting left behind."

Mrs. Patterson, in her own graduate education classes, learned "how most things that students are being trained for in college now are going to be obsolete by the time they're actually out of college…I can't think of a job that doesn't use some sort of technology" (Lisa Patterson, personal communication, October 12, 2011). Again, a similar concern was raised by Mrs. Duvall who said:

> I heard that in the U.S., our job market's so poor, but the jobs that are going unfilled are computer programming jobs. I was thinking about that because my kids are in high school and, you know, my children would really need more…they really have more need of computer classes than they do some of these higher level math classes, frankly. (Sarah Duvall, personal communication, October, 7, 2011)

Not only was this sentiment of urgency felt at the middle and high school levels, but even the elementary teacher participants recognized the need to adapt, as kindergarten

teacher Mrs. Sims stated:

> I mean, just look at the way the world communicates now. It's all so technology-heavy. So, you know, these kids are going to have to learn to live in a world that's even more advanced than what we are in right now, I think, and they've got to be ready. We've got to get them ready. (Beverly Sims, personal communication, October 17, 2011)

Mrs. Taylor, in her personal interview (Marsha Taylor, personal communication, October 13, 2011), described her belief that the world is headed more towards a technology-rich society where everything is driven by some type of technology:

> I think it's again, where we're headed. It's one thing all children will need to learn and know in the coming centuries. I feel like if they don't know it, they are going to fall behind. And it seems like everything is being done that way in society now, banking, communicating, applying for jobs, all types of things, research is all done through computers and technology. And if they don't have those skills to learn how to access those things, then they're going to be left behind.

Mrs. Bolden did not diverge from this perspective, as she stated, "100% it will be in their job, I believe no matter what job they do" (Ashley Bolden, personal communication, October 13, 2011). She went on to add, "If they are running a company, they will have to know how to use technology. If they are a custodian, they are going to have to know how to use technology to account for materials, to get new supplies."

Teachers' fears and beliefs about existing barriers. Across all three technology self-efficacy levels, several participants shared similar fears about technology as well as

expressed similar barriers that they believed existed with using more instructional technology in their classrooms. Similar fears shared by participants included the fear that instructional technology may not work when they needed it, or that it may break, which was scary to some because of the cost associated with several instructional technology tools. Similar barriers identified by multiple participants across self-efficacy levels included lack of funding to purchase or support teacher training in instructional technology, as well as school and district policies and procedures involved in using instructional technology.

With regard to fearing that instructional technology may not work when they needed it, although participants who had very high self-efficacy did express a positive belief in their ability to figure out technical issues or troubleshoot when problems arose, some of those teachers with very high self-efficacy still cited something going wrong as a natural fear they held. For example, in his personal interview (John Walton, personal communication, September 23, 2011), Mr. Walton stated, "The only thing that kind of worries me is when I haven't prepped enough on using something that I haven't used a lot before and then it kind of blowing up in your face when you're in the classroom." Mr. Phillips shared the same fear in his personal interview (George Phillips, personal communication, September 30, 2011) as he stated, "I still have this sort of ridiculous fear that something is not going to work, that I will plug it up and have some sort of difficulty of some sort." Several other participants expressed similar concerns and explained that they became frustrated when they spent time and put in effort to create lessons integrating technology, and then when they went to execute those lessons, something went awry.

Other than the technology not working when the teacher needed it, the fear of breaking expensive instructional technology equipment and being held responsible for doing so was a fear shared by multiple participants, regardless of their self-efficacy level. For example, in her personal interview (Beverly Sims, personal communication, October 17, 2011), Mrs. Sims stated, "If it breaks…the thing about the Mimeo that scares me the most is that kids are going to hit the pen too hard on the white board, break the pen." Additionally, Mrs. Taylor (Marsha Taylor, personal communication, October 13, 2011) described her fear of items breaking:

> I'm always afraid that something is going to break. The cost of it obviously is always a factor, especially with our laptops and the Mimeo. We know that those things are not just a couple of bucks here or there. They're expensive, and so the caution that they are going to break, whether the children are using them or we do something to them that's going to cause them to break, that's my one true fear.

For purposes of this study, there is a subtle distinction between barriers identified by participants and fears identified by participants. Barriers refer to external or environmental factors that contribute to teachers not being able to use instructional technology, whereas fears refer to internal feelings or physiological responses experienced by the participants about instructional technology. One of the barriers cited by multiple participants was a lack of funding. This funding may be connected to lack of money designated for training teachers on how to use instructional technology, or simply the lack of money available for purchasing instructional technology. In her personal interview (Sarah Duvall, personal communication, October 7, 2011), Mrs. Duvall stated:

> I'm a little frustrated right now because there's so much out there that we do not have funding for, and then we have some stuff here that we've not had training with. So, we've got a long way to go. But funding, for sure, is the major impediment.

Mrs. Duvall went on to say, "You really have to have a lot of money to buy a lot of technology, so the teachers can practice it on a daily basis to get good at it," and "the money is not there to buy these expensive pieces of equipment." The amount of funding to buy instructional technology equipment seemed to differ from school to school as stated by Mr. Ferris, "You know, it all comes down to money and budgets and that sort of thing. And some schools have the money and have the budgets and have quite a few Smart Boards around, and other schools haven't" (Ryan Ferris, personal communication, October 10, 2011). Lack of funding was not limited to purchasing equipment for teacher use, but it also included purchasing technology to aid students in their learning. Mrs. Sims stated, "I know this is probably not affordable, but I think every kid ought to have their own laptop or their own iTouch or their own iPad or something" (Beverly Sims, personal communication, October 17, 2011).

In addition to a lack of funding, several participants saw existing school and district policies and procedures as barriers that deterred teachers from incorporating instructional technology into their classrooms. Mrs. Taylor expressed, "We are very bound by the rules of what [the district] allows us to do and what they don't allow us to do" (Marsha Taylor, personal communication, October 13, 2011). To add to this sentiment, in his personal interview (George Phillips, personal communication,

September 30, 2011), Mr. Phillips stated, “I feel like [the district] specifically handcuffs teachers in terms of allowing us to do things,” and “I had to jump through nine different hoops to show a clip from this movie.” Mrs. Duvall, in her personal interview (Sarah Duvall, personal communication, October 7, 2011), explained a similar problem with regard to the approval process in place at some schools:

> Some schools are requiring teachers to run a clip from YouTube through the media committee. One school said they were requiring if a teacher wanted to use a clip, she had to fill out a form and get two other teachers to sign off saying they had previewed it and thought it was appropriate. Then, if something happened and they got in trouble, those other teachers would get in trouble as well because they signed off on it.

Due to daunting approval processes to incorporate certain instructional technology tools currently in place at some schools in the district, some teachers were apprehensive to put in the effort to go through such processes.

Desire to be a life-long learner. A final theme that emerged across all three technology self-efficacy levels was that of sharing the similar personality trait of being a life-long learner. Self learning, in the context of this study, refers to teachers’ willingness to learn about new ways to enhance their teaching instruction. Although the participants believed they lacked the time to learn as much as they would like to about instructional technology, all participants described their desire or commitment to learn when or if time was available.

Mrs. Sims, who has low-to-medium technology self-efficacy stated, “[My

principal] always tells me that, you know, she can count on me to try something new—and technology included" (Beverly Sims, personal communication, October 17, 2011). Mrs. Sims also talked about how making a commitment to staff development was the way she has learned many new things to enhance her professional practice. In her personal interview (Alice Stanson, personal communication, September 21, 2011), Mrs. Stanson stated:

> That's my goal as a teacher to make my class evolve with my kids...I'm learning new things and trying to put them to work in the classroom. If I know something will work better, why not try it? Why not make it better if it's better for the kids?

Mrs. Patterson shared a similar desire to try new things to make learning more engaging for her students when she stated, "I think I'm just constantly trying to look for new ways to do something where not just the sit-down worksheet type of teacher. So I feel like I'm constantly looking for ways to engage students that way" (Lisa Patterson, personal communication, October 12, 2011).

Those participants with medium-to-high self-efficacy also stated their desire to learn new things. For example, Mr. Phillips stated, "I'm curious and I like knowing things, so the Internet specifically or these vehicles to get to the Internet provide me with the opportunity to sort of satisfy my thirst for knowledge" (George Phillips, personal communication, September 30, 2011). In her personal interview (Ashley Bolden, personal communication, October 13, 2011), Mrs. Bolden explained that she, too, liked to learn new things to help her kids, as did Mrs. Duvall who explained that she often took equipment home when she could to play around with it and learn more about it.

Finally, those participants with very high technology self-efficacy explained, on multiple occasions in their personal interviews, instances when they played around with technology or even taught themselves how to navigate different types of technology. In his personal interview (John Walton, personal communication, September 23, 2011), Mr. Walton stated, "The Smart Board we just got this year; I had to spend a pretty good bit of time with that. We didn't have training for it. I just kind of taught myself how to use it on the side." Both of the other two participants with very high technology self-efficacy shared similar statements about learning about technology by playing around with it.

Differences among Participants with the Same Technology Self-Efficacy Levels

When analyzing the research, not only were similarities between and among varying technology self-efficacy levels explored, but also differences between and among participants of the same technology self-efficacy levels were examined. In this section, differences identified between or among participants at each of the three technology self-efficacy levels are described.

Participants with low-to-medium self-efficacy. Of the three participants in the study who scored in the low-to-medium range of technology self-efficacy on the survey, years of teaching experience ranged from as few as two years to as many as 25 years. Additionally, one participant was an English language arts teacher, one was a connections teacher who taught public speaking and student leadership, and one was a kindergarten teacher who taught all core subjects. Although two of the three participants' responses from this efficacy level revealed they were not persistent or confident in figuring out or troubleshooting technology on their own when problems arose, one of the participants did

feel confident in troubleshooting. In her personal interview (Lisa Patterson, personal communication, October 12, 2011), Mrs. Patterson stated, "I feel like even if the technology kind of confuses me at first or I have not sat down to look at it yet, I feel confident in my ability to figure it out."

Participants with medium-to-high self-efficacy. Of the three participants in the study who scored in the medium-to-high range of technology self-efficacy on the survey, years of teaching experience ranged from as few as five years to as many as 21 years. All three participants taught different subject areas, with one teaching social studies, one teaching media services, and one teaching all core subjects in third grade. Two of the participants believed they were innovative when it came to teaching, whereas the third participant in this category did not. In his personal interview (George Phillips, personal communication, September 30, 2011), Mr. Phillips stated, "Sitting down and coming up with something new and exciting and cool is just not going to happen. My brain doesn't work that way. I'm more of a 'take it and perfect it' sort of person, not create it." One of the three participants from this level was male. Also, of these three participants, one had not led any instructional technology professional development sessions while the other two participants had.

Participants with very high technology self-efficacy. Of the three participants in the study who scored in the very high range of technology self-efficacy on the survey, years of teaching experience ranged from nine years to 15 years. This efficacy level also had a majority of males. All three participants taught different subject areas, one participant taught physics, one taught mathematics, and one taught all core subjects in

first grade to students receiving special education services. Two of the three participants had access to and utilized multiple forms of advanced technology at home, for example, iPhones, iPads, and iPods, while one of the participants did not own a Smart Phone and explained that he very rarely utilized technology at home for reasons beyond email and banking. In his personal interview (Ryan Ferris, personal communication, October 10, 2011), Mr. Ferris discussed how often he used technology at home, "Well, I mean, not a ton. You know, I use it when I need to, you know…I'm not on Facebook; I don't get into all that stuff. Yeah, I mean email and banking, and that's about it." Two of the three participants in this category had experience with leading instructional technology professional development sessions.

Summary

The CTI Survey (Wang et al., 2004) was used to identify teachers' current technology self-efficacy levels from each of the three participating school sites. Survey results indicated that 53.7% of survey respondents fell into the medium-to-high technology self-efficacy range. Also, all male respondents scored in either the medium-to-high or the very high range of technology self-efficacy, whereas female respondents scored across all three technology self-efficacy levels.

Personal interviews provided information regarding each of the nine participants' teaching backgrounds and personal experiences with technology. Additionally, the personal interviews, along with the three focus groups, revealed factors that influenced teachers' technology self-efficacy levels. Factors were either work-related or personal/outside factors. The work-related factors included participants' perceptions of

local school support for instructional technology, participants' perceived knowledge of their access to instructional technology at their schools, participants' content area focus, the amount of time participants used instructional technology during the work day, perceived barriers, and participants' beliefs about available opportunities to learn about instructional technology, either at the school or district level. Personal or outside factors identified were participants' personality traits, participants' home access to and/or personal time to learn how to use technology, participants' attitudes toward technology, and participants' fears about using technology.

Factors that influenced teachers' technology self-efficacy and that were connected to professional development opportunities were revealed through personal interviews, focus groups, and a document analysis of professional development documents from each of the three schools. Work-related factors connected to professional development, participants' previous training and experiences connected to instructional technology, and the amount, availability, and types of previous and current professional development opportunities were all explored through open coding of transcripts and cross-referencing relevant coded segments with the professional development documents. Additionally, participants' ideas for future professional development opportunities to increase teachers' technology self-efficacy levels were identified as a result of participants' personal interview and focus group responses.

Five common themes were found regarding similarities between and among participants of varying self-efficacy levels. The first theme revealed that teachers did not believe enough time was available for them to practice using instructional technology;

this time included work time and personal time. Regarding the second theme, the results indicated that teachers shared similar beliefs about available professional development opportunities to learn about instructional technology. The third theme revealed teachers' attitudes, regardless of technology self-efficacy level, were overall positive toward technology, and all participants agreed that technology was a great way to engage students, technology was what was relevant to today's students, and being technologically literate was essential to students' future success. A fourth theme identified was that multiple participants at all levels had a fear that technology may not work when they needed it or that they were scared of technology breaking. Also part of this fourth theme was participants' shared beliefs that specific barriers existed that kept them from being able to utilize instructional technology as much as they would like. The fifth and final theme was that all participants at all three levels shared the similar personality trait of being life-long learners. Although time constraints and other factors contributed to participants' opportunities to learn about instructional technology, all of them cited a desire to learn in order to enhance their professional practice.

Also examined were the differences among participants of the same technology self-efficacy levels. Although participants may have scored in the same range of technology self-efficacy, there were notable inconsistencies among them, such as years of teaching experience, personal experiences with technology, content area focus, personality traits, and at two levels, gender.

The next chapter focuses on the implications of this research study. Additionally, there is a discussion of how relevant research connects to the study's results, and the

chapter concludes with information about the limitations for this study, as well as recommendations for future research.

CHAPTER FIVE: FINDINGS AND DISCUSSION

Twenty-first century skills are no longer an added bonus to a person's résumé, but rather, they are essential to someone's future success, and as a result, educators have a responsibility to equip today's students with such skills (Mullen & Wedwick, 2008). Uses of technology are no longer limited to making non-instructional or administrative tasks more manageable and efficient. With today's technological advancements, instructional technology tools exist that create opportunities for teachers and students to more meaningfully and innovatively engage in teaching and learning practices. In the United States alone, significant amounts of money have been invested in technology with the intent to promote educational reform and keep American students competitive with their global counterparts (Palak & Walls, 2009).

The focus of this study was on teachers' technology self-efficacy. The purpose was to examine teachers' technology self-efficacy levels in order to identify specific factors that influenced their current levels. This study concentrated on teachers' confidence with respect to integrating technology into their instructional practice. Three elementary, three middle school, and three high school high school teachers from the same northeast Georgia school district were chosen to participate in this study. Each of the nine participants completed a technology self-efficacy survey, took part in one personal interview, and one focus group. Teachers' current technology self-efficacy levels were determined as a result of quantifying participants' survey responses. After interviews and focus groups were conducted, they were transcribed and coded to

determine factors that influenced teachers' current technology self-efficacy levels. Additionally, professional development documents from the three schools were collected and analyzed to develop an understanding of previous and current professional development opportunities available to teachers.

Summary of the Findings

Multiple factors that influenced teachers' technology self-efficacy were discovered in this study. The results showed that both work-related factors and personal or outside factors played a role in influencing teachers' technology self-efficacy. Although not all of the identified factors influenced each of the participants, at least one identified factor influenced one or more participants. Work-related factors identified were (a) participants' perceptions of local school support for instructional technology, (b) participants' perceived knowledge of their access to instructional technology at their schools, (c) participants' content area focus, (d) the amount of time participants use instructional technology during the work day, (e) perceived barriers, and (f) beliefs about available opportunities to learn about instructional technology, either at the school or district level. Personal or outside factors identified included (a) participants' personality traits, (b) home access to and/or personal time used to learn about technology, (c) attitudes toward technology, and (d) fears about using technology.

Of the factors identified that influenced teachers' technology self-efficacy, three of the work-related factors were connected to professional development opportunities. Additionally, five common themes were found between and among participants of varying self-efficacy levels. The first theme indicated that teachers felt there was a lack

of available time to practice using instructional technology. A second theme revealed that teachers shared similar beliefs about available professional development opportunities to learn about instructional technology. The third theme showed teachers' attitudes toward technology were positive, regardless of their level of technology self-efficacy, while the fourth theme showed that teachers, regardless of technology self-efficacy, had fears about using instructional technology and believed that barriers existed that kept them from being able to use instructional technology as often as they would have liked. The fifth and final theme revealed that teachers shared the similar personality trait of being a life-long learner, regardless of their technology self-efficacy level. The results also showed that years of teaching experience, personal experiences with technology, content area focus, other personality traits, and in some cases, gender were differences or inconsistencies that existed between and among teachers of the same technology self-efficacy level.

Implications of the Study

This case study identified factors influencing teachers' technology self-efficacy levels. The study also revealed relationships between identified factors and professional development opportunities related to technology as well as similarities and differences between and among participants of varying technology self-efficacy levels. Several implications exist based on the results of this case study that can aid educational stakeholders in enhancing teachers' professional practice, which in turn, can create richer learning experiences for students.

Gender. This study revealed that gender may play a role in influencing one's technology self-efficacy. The self-efficacy survey results showed that males, overall, had

higher technology self-efficacy than did females who responded to the survey. An overwhelming percentage, 81.8%, of male survey respondents scored in the very high range; 18.2% of male respondents scored in the medium-to-high range, and no male respondents scored in the low-to-medium range. Contrastingly, 16.3% of female respondents scored in the very high range while the majority of female respondents scored in the medium-to-high range, at 60.5%, and 23.2% of female respondents scored in the low-to-medium range. This finding indicates that males may tend to have higher technology self-efficacy than females.

In this case study, two of the three participants from the very high technology self-efficacy level were males. The only female participant from this level was an elementary school teacher. No males from the elementary school involved in the study chose to respond to the initial survey that was distributed. Literature on gender and computer-efficacy supports the finding that males tend to have higher technology self-efficacy than females. In Jun and Freeman (2010), they cited Bem's seminal work (1981) which posited that "sex typing is a learned phenomenon mediated by cognitive processing." Jun and Freeman (2010) went on to cite Srite and Karahanna (2006) by adding that "individuals learn society's gender role standards and expectations, and they accordingly develop attitudes and conduct behaviors that society deems gender appropriate." If females perceive that society expects them to know and use less technology, then they are more likely to adopt this same expectation for themselves. In another study by Mackay and Parkinson (2010) involving South African technology teacher trainees, they too found that females had lower self-efficacy than did males.

Beyond society creating norms or expectations that may play a part in the differences between females and males in regard to self-efficacy, so too might the different mindsets each gender has when they are self-reporting their self-efficacy, as was suggested by Pajares (2002):

> A second factor that may be responsible for gender differences in self-efficacy and in confidence to use self-regulated learning strategies is the tendency of boys and girls to respond to self report instruments with a different "mind set." Researchers have observed that boys tend to be more "self-congratulatory" in their responses whereas girls tend to be more modest (Wigfield et al., 1996). In other words, boys are more likely to express confidence in skills they may not possess and to express overconfidence in skills they do possess. (p. 119)

Based on this information, educational stakeholders should be mindful of how they, and society in general, communicate and perceive the expectations of females with regard to technological skills and abilities. Concentrated efforts should be made to build females' perceptions of their own capabilities to learn and use instructional technology in order to increase females' technology self-efficacy. Additionally, self-efficacy reports might be more accurate if followed up with or compared to observations involving items on which participants self-reported. Finally, it should be noted that one discrepancy from the literature in relation to this finding about gender is that females who feel less capable using computers may also develop negative attitudes toward using computers (Jun & Freeman, 2010). Contrastingly, all of the female participants in this study expressed positive attitudes toward technology regardless of their confidence level.

Connections to professional development. Identified factors influencing teachers' technology self-efficacy revealed that three out of six work-related factors showed a relationship to professional development. The first factor related to professional development was teachers' perceptions of local school support for instructional technology. Participants shared the perception that their local school technology support specialists were willing, able, and available to support them when teachers needed their assistance with instructional technology. The majority of participants explained that these specialists were helpful in troubleshooting with hardware or software issues and even provided one-on-one support when it was requested by the teacher.

In order to continue to build teachers' technology self-efficacy, educational stakeholders should make it a point to protect and secure the funding for local school support specialists in their buildings as they provide a critical service to teachers and help promote the development of technological skills among the teaching faculty. In a time when educational budgets are being cut, school leaders must constantly re-evaluate their staffing decisions and carefully make choices that will support teaching and learning. The findings from this study highlight the important aid these specific school personnel provide teachers. In support of this finding is a discussion about the benefits of technology use from the U.S. Department of Education (1996), and in that discussion an example of how teachers are supported through such school personnel was presented. This example involved a Texas middle school where the technology program was supported in multiple ways, one of which involved additional personnel supporting the technology program. Specifically, this school had a full time technology assistant and a

part-time district technology coordinator who worked together to conduct training and keep technology running smoothly (U.S. Department of Education, 1996).

The second factor identified related to professional development was teachers' knowledge of access to instructional technology in their school buildings. Some of the participants, in their personal interviews, discussed their lack of knowledge of available instructional technology in their school. Without knowledge of what is available to them, teachers will be unable to utilize instructional technology. School leaders must find a way to effectively communicate availability of instructional technology tools and resources in order to better educate teachers as to what currently exists to aid them in their instructional practice. Future professional development opportunities should focus on educating teachers about all that is available to them as a starting point to promote access to and teachers' use of instructional technology.

The third and final factor related to professional development was teachers' beliefs about available professional development opportunities. Although the teachers believed there were several professional development opportunities available and the professional development documents from each of the three schools supported this belief, the current structure of such opportunities does not necessarily promote development of teachers' technology self-efficacy. This finding is in accordance with one of the U.S. Department of Education's (2004) seven major action steps and recommendations for moving American education forward, which is improving teacher training to promote effective technology use as "teachers need access to research, examples and innovations as well as staff development to learn best practices" (para. 3). Available opportunities are

mostly limited to the basics of instructional technology, are usually not required, and are oftentimes one-time only opportunities.

Several participants shared that professional development opportunities at their local school focused on an introduction to the basics of various instructional technology tools and resources and failed to go beyond the basics so as to help teachers understand and explore specific examples of how these tools and resources may be used in their own classrooms. Also, because they focused on the basics, several teachers felt they lacked the confidence to go back to their classrooms and use instructional technology because they had not learned enough to be able to troubleshoot in the event that something went wrong when using the tool or resource.

This finding is supported by Brooks-Young (2005) who discussed that teachers need specific professional development opportunities to move into later stages of proficiency and be fully ready to integrate technology as a teaching tool. Salah (2008) also explained the importance of teacher training being specific. In order to move teachers forward and truly develop their technology self-efficacy, teachers could benefit from leveled professional development opportunities. Additionally in support of this finding, Lambert, Gong, and Cuper (2008) believed that in order for teachers to grow their skills and learn how to meaningfully integrate technology, training would have to go beyond a focus on basic computer skills. According to Brooks-Young (2005), "Technology tools can help teachers design activities that prepare students to deal with expanded workplace demands, but only if those teachers are willing to become more advanced technology users themselves and implement new teaching strategies" (p. 15). If

schools could offer beginner, intermediate and advanced classes on instructional technology, then teachers would have the chance to build their knowledge and skills of instructional technology over time.

Another concern raised by a few of the participants was in relation to each of their schools not mandating that teachers attend the professional development opportunities regarding technology. Although each of the three schools offered choices for professional development opportunities, which was desirable to teachers, the issue identified was that teachers who may not feel confident in instructional technology may elect to avoid attending professional development opportunities that could build their skills. Without requiring teachers to attend professional development opportunities that are focused on instructional technology, inevitably, some teachers will continue to choose not to attend when in fact, attending such offerings could serve to build their confidence and skills and equip them with strategies that could not only enhance their teaching but also the learning of their students. This concern relates to a study by Palak and Walls (2009), which speaks to the importance of a school's buy-in to technology. In their study, they described three teachers who all had high confidence with technology and how these teachers worked at schools that made a concentrated commitment to technology by designating significant amounts of funding toward school personnel, training, and the purchase of technological resources. Palak and Walls (2009) further explained that these schools had a culture that promoted the integration of technology and incorporated this expectation into teachers' evaluations.

Additionally, several professional development opportunities were offered as one-

time only sessions, with little to no follow-up. Since these opportunities were offered as isolated events, teachers tended to forget what they had learned. Knowing there would be no follow-up training further discouraged teachers from going out on their own to learn and use instructional technology more because they may have felt the efforts to train them were short-lived and sporadic at best. Previous research supports this finding, as Brooks-Young (2005) expressed that a major impediment keeping teachers from making effective use of technology in their classrooms was the lack of follow-up training and on-going support. Lambert, Gong, and Cuper (2008) explained that additional and on-going opportunities for learning, such as further modeling, could help teachers maintain or grow their abilities. In the absence of follow-up opportunities and continued support, it is not likely that teachers' confidence in their skills will advance to a point that changes their practice.

It should be noted that a few of the professional development opportunities discussed by participants and further described in professional development documents spanned an extended period of time, ranging from one month to one school year, and focused on one particular technology providing a range of levels. In these instances, teachers who participated in such opportunities who were interviewed shared that these experiences served to successfully develop their confidence and skills with instructional technology. These participants explained that these specific opportunities included an introduction to a specific type of instructional technology, involved follow-up training, and allowed teachers time to practice using the instructional technology of focus. As a result of this finding from the study, it would be beneficial to teachers if school leaders

would provide more of this type of targeted and leveled professional development opportunity at their local schools and within the district.

A specific goal of Georgia's technology plan, which the state aims to achieve by 2012, targets professional development:

> Increase the capacity of school systems to provide the high-quality system support necessary to realize effective technology use, especially in the areas of administrative support for effective instructional technology use; professional development, technical support for hardware, software, and network infrastructure; technology planning; and program evaluation. (Georgia Department of Education, 2003, p. 39)

This goal strongly connects to the findings in the literature that identify a need for school districts to not only maintain local school support systems already in place but also to increase support of teachers in terms of providing professional development opportunities that will serve to develop teachers' confidence in effectively using instructional technology (Lambert, Gong, & Cuper, 2008; Palak & Walls, 2009). P21 (2010) urges policy makers to provide professional development opportunities that are strategically aligned to support the goal of ensuring 21st century readiness for every student. Without a devoted and consistent effort to provide targeted technology professional development, teachers will face the challenge of developing their own 21st century skills and consequently, those same skills in their students.

Current school structure and work demands. This case study suggested that current school structures and work demands may have hindered teachers' technology

self-efficacy development. The responses from all participants were similar in regard to whether or not they felt they had enough time during the work day to learn about instructional technology. Every participant believed they lacked adequate time during the work day to build their skills in this area. This finding is consistent with previous research (Compeau & Higgins, 1995; Kellenber & Hendricks, 2003; Littrell et al., 2008; Palak & Walls, 2009) that revealed that teachers believed adequate time and certain skills were necessary in order to use technology. Teachers in this study cited before school, after school, and planning periods as the only times that were available for them to use however they chose, and due to more pressing matters, teachers did not feel they could use the little "free" time that was available to concentrate on learning about instructional technology. Preparing for upcoming lessons, managing paperwork, contacting parents, and inputting grades were all examples of tasks teachers felt took precedence over taking the time to learn about instructional technology.

Before school, after school, and planning periods do not currently offer enough time for teachers to learn about or practice using instructional technology. Structured time to practice using instructional technology was a main idea cited by all participants as a way to increase teachers' technology self-efficacy, but currently, the structure of the teachers' work day excludes this time element. Teachers believed that in other parts of the world and even in other school districts in the state and around the country, school days are structured in a way that allows for more opportunities for teachers to come together or even independently learn ways to enhance their professional practice. In order for teachers to be able to authentically build their skills with regard to instructional

technology, school leaders should think creatively about ways to restructure the work day so as to allow for planned time for teachers to learn such skills. Some of the teachers also cited current work demands as reasons that kept them from having enough time to learn about instructional technology. With so much content to cover in a specified amount of time and the accompanying pressure of high-stakes testing on the required content, teachers did not always believe they had the luxury to take the time out to learn about technology.

The findings in this study regarding teachers' beliefs about the impediments posed by current school structures, and subsequently, the call for rethinking how schools conduct their daily work are supported by Schleicher (2011), who affirmed that 21st century learning is about shifting the ways we do business. Brown and Luterbach (2011), echoed this sentiment and stated, "massive changes to the culture of schools and school districts are necessary to properly prepare learners for the 21st century" (p. 22). In order to address this concern, school leaders need to brainstorm ways to address required content through the means of instructional technology, and then subsequently provide training for their teachers. If teachers do not view instructional technology as a vehicle to support them in teaching the required content they must cover, then they are not as likely to commit their time to learning about instructional technology. Moreover, it is imperative that, having recognized that there have been shifts in the ways students learn, educators must follow suit and shift the ways in which they teach, and ultimately, educational leaders must be open to shifting the ways in which they promote and support teaching and learning.

Impeding barriers. In this case study through personal interviews and focus groups, the results revealed that barriers existed that prevented teachers from using instructional technology, which in turn, impeded the development of their technology self-efficacy. One barrier believed to exist as stated by multiple participants was a lack of funding for both training teachers on instructional technology and purchasing instructional technology tools and resources. Mrs. Duvall (Sarah Duvall, personal communication, October 7, 2011) cited lack of funding as a major impediment and stated, "I'm a little frustrated right now because there's so much out there, and we do not have funding for it, and then we have some stuff here that we've not had training with. So, we've got a long ways to go." This statement emphasizes two major elements. The first is that equipment must first be purchased in order for it to be used by teachers. The second is that the equipment that is purchased does little good to anyone if those expected to use it lack the knowledge of how to use it effectively. Duvall's statement resonated in an article by Hileman (2010), where he too discussed the need for training on technology tools that have been purchased and how technology tools such as interactive white boards are really no more than expensive overhead projector screens without an effective professional development strategy in place that properly trains teachers on the use of such tools.

Although the district has a comprehensive technology plan in place and has a significant amount of money targeted toward technology, teachers do not feel the funding is adequate given the current needs that exist. If the money designated for technology is not being spent to meet the specific needs of the teachers who use the technology, then

the money has been used ineffectively. The findings from this study related to funding are similar to one of the major challenges identified in the U.S. Department of Education's National Technology Plan (2010), which recognized that although the country is currently experiencing tight economic times, there is an urgency to find ways to effectively integrate technology while at the same time maintain financial stability. This challenge was further echoed by Duncan (2010), who expressed the need to improve learning outcomes while managing costs. It may be beneficial for school leaders to re-evaluate how the funds for technology are currently being spent and involve teachers in this discussion to ensure funds are maximized in the areas of highest need and demand. This suggestion is supported by P21 (2010), as one of P21's recommendations warrants that policy makers engage educators, employers, community members, and parents in a dialogue about what can be done to promote 21st century education. Teachers play a significant role in students' learning experiences and should thus be an integral part of conversations focused on ways to enhance those learning experiences.

In addition to funding as an existing barrier, school and district policies and procedures may also deter teachers from using instructional technology. Multiple participants discussed how they believed the district handicaps teachers with regard to using instructional technology. Specifically, the prohibition of various websites that teachers might find useful and effective in their instruction was an example of how the district inadvertently deters teachers from using instructional technology. Up until last year, YouTube was not accessible through the district's network, as it was blocked, and although in 2011 that specific access has been granted, various other sites are still

blocked. Some of the teachers felt it was contradictory to encourage the use of technology in instruction yet place restrictions that made such use difficult. This finding is similar to Brooks-Young's findings (2005) on how students felt the place where they had the least opportunity to use technology was at school. Brooks-Young (2005) also explained that although the reason for limited use of technology in some schools was a result of limited access, in other schools that were well-equipped, technology use was still often limited. Additionally, this finding supports the need to focus efforts on achieving another of the seven specific goals in Georgia's technology plan which involves increasing access for educators to information technology resources that can enhance student learning (Georgia Department of Education, 2003). In order to reinforce and promote the message about the positive potential of using instructional technology, it will be important for district leaders to consider ways to lift some of the restrictions currently in place while still maintaining a secure learning environment for teachers and students.

Local school policies and procedures were other barriers cited by participants. For instance, in order for teachers to use video clips in their classroom instruction, several schools require that the teachers go through a series of steps to have the video clip approved. In some cases, these steps are difficult and time-consuming, and as a result, deter teachers from using this valuable resource. With lack of time already cited as a major concern by teachers, having a system in place that asks for more of teachers' time, it is not surprising that some teachers choose to forego this route. The importance of rethinking policies and procedures in education was discussed by Umphrey (2010), when

she interviewed well known education researcher, Darling-Hammond, who offered her perspective on what she thinks is important as we work to support 21st century learning:

> I think it's going to be very important for school professionals to be engaged not only in defining the knowledge and skills for their profession and lobbying for access to learning opportunities to acquire those kinds of abilities themselves but also in defining and shaping policy context within which they do their work. (p. 48)

In order to address these issues, school leaders should work together, and again, involve teachers to develop and determine an effective and efficient process for approving various instructional technology tools and resources so as to encourage their integration into teachers' instructional practice. Darling-Hammond (as cited in Umphrey, 2010) also stated that "we need to make schools safe for good practice. Policy needs to be supportive of rather than hostile to good practice. That will require that school principals and their organizations are at the table, shaping policy and practice" (p. 53).

Teachers' ideas for increasing technology self-efficacy. This case study examined teachers' ideas for ways to increase teachers' technology self-efficacy. Because teachers are the ones instructing students and the ones whose technology self-efficacy we want to increase, what better way was there to find out how, than to ask them directly? Personal interviews and focus groups revealed teachers' ideas for ways their technology self-efficacy could be positively influenced. Four ideas were identified, and two of them emerged as a result of discussions on factors already presented that were related to professional development opportunities: more targeted and specialized teacher training

on instructional technology and increased knowledge of and access to instructional technology tools and resources.

Two additional ideas that surfaced were increased teacher collaboration with a focus on instructional technology and creating opportunities for teacher observations and demonstrations. Through increased teacher collaboration with a focus on instructional technology, teachers would have the opportunity to share, discuss, and explore ways to integrate instructional technology in their instructional practice. Duncan (2010) identified the need to connect teachers and leverage technology to enable us to build the capacity of teachers. He also discussed the benefit of online learning communities which would create opportunities for teachers to collaborate with peers, as well as reach out to experts all over the world. Because teachers are in the trenches teaching students, they can easily relate to other teachers and provide significant support to their colleagues to help promote effective uses of instructional technology.

In a similar vein, teachers could benefit from participating in opportunities to observe other teachers and see teacher demonstrations of effective instructional technology use. These ideas are consistent with one of the goals presented in Georgia's technology plan, which states the need to increase teachers' proficiency to use technology effectively in order to enhance student learning (Georgia Department of Education, 2003). Personally seeing and being able to visualize ways to use instructional technology in the authentic context of the classroom could be very powerful for teachers in helping them to gain the understanding and confidence they need to go back to their own classrooms and implement such strategies effectively. This idea also resonates with SCT

because it promotes vicarious learning experiences, which is one of the identified sources of efficacy (Bandura, 2000).

Given that teachers currently have little time available to learn about or practice using instructional technology, school leaders should consider creative ways to structure the work day so that teachers can have release time to participate in this type of learning experience. Or, perhaps schools can leverage the technological resources they already possess to find ways to capture teacher demonstrations and then make those demonstrations accessible to teachers as a learning reference. Similar to the findings in this case study were suggestions made by Means (2001) and Rotherham and Willingham (2009), which involved the need for educational policy makers to make deliberate and concentrated efforts toward developing and providing teacher training with the intent to increase teachers' confidence and capacity to use instructional technology effectively.

Attitude alone is not enough. A sixth implication of the case study suggested that although teachers' beliefs and attitudes toward instructional technology are positive, they do not necessarily have very high technology self-efficacy. Previous research on attitudes in relation to self-efficacy demonstrated a strong correlation between the two (Bandura, 2002; Lumpe & Chambers, 2001; Palak & Walls, 2009; Vannatta & Fordham, 2004). However, findings from this study suggest that attitude alone does not affect self-efficacy level. For instance, all nine participants described similar, positive beliefs and attitudes toward instructional technology, but only three of the participants had very high technology self-efficacy.

All participants believed technological skills are essential to students' future

success. This belief echoes previous studies conducted by Wenglinsky (2005), which found that students will benefit from technology because it will prepare them for the technology-rich environment in which they live and must work, and by Means (2001), who concluded that those students who develop technological skills will be at an advantage over those who lack the same skills. All participants shared the attitude that they liked or enjoyed technology because it helped create meaningful learning experiences and helped make learning relevant to today's students. In conjunction with this finding, both the U.S. Department of Education (2010) and March (2006) cited the ability of technology to make learning real, rich, and relevant to students' personal lives now and in the future. Ultimately, this finding supports the need to examine multiple aspects in relation to technology self-efficacy in order to develop a more comprehensive understanding of how technology self-efficacy is most significantly influenced.

Findings in relation to theoretical framework. The theoretical framework for this study was grounded in Bandura's Social Cognitive Theory (SCT) of which self-efficacy is a major component. Social cognitive theory views humans as being proactive organisms who engage in self-reflection, self-regulation, and self-organization before deciding to adopt specific behaviors (Bandura, 1986). The theory also suggests that personal, behavioral, and environmental factors affect efficacy. Because the focus of this study was to identify factors that influenced teachers' technology self-efficacy, it was appropriate to use Bandura's SCT as it takes into account multiple types of factors that may play a role in influencing one's decision to adopt or carry out a specific behavior.

Overall, the results of this study in relation to SCT supported that various types of

factors, including personal, behavioral, and environmental, contribute to the development of one's efficacy. Certain personality traits were identified as influencing one's technology self-efficacy; for example, the majority of those participants who discussed their willingness to persevere and troubleshoot when faced with challenges while using instructional technology had higher self-efficacy than those who did not identify with this trait. This finding aligns with what Bandura (1994) believed about innovative achievements requiring a sustained investment of effort while not knowing what the final results will bring. Similarly, Vannatta and Fordham (2004) found that risk-taking and being open to change contributed to teachers' decisions to use technology. Additionally, behavioral factors were identified in this study, as those participants who had advanced knowledge of instructional technology had higher self-efficacy than those who lacked knowledge of instructional technology, and mainly this increased knowledge was due to some teachers' decisions to go above and beyond on their own time to learn how to use technology. Finally, environmental factors were found to play a role as well. Several participants expressed that barriers existed which kept them from being able to learn about and use instructional technology. Such barriers included the current structure of the work day, daily work demands, lack of time, funding, and school or district policies and procedures. These findings are supportive of SCT and the concept that "human agency operates in an interdependent causal structure involving triadic reciprocal causation" (Bandura, 1998, p.62). Triadic reciprocal causation involves multiple factors, personal, behavioral, and environmental, operating as interactive determinants "that influence each other bidirectionally" (Bandura, 1998).

Participants also shared ways in which they believed their technology self-efficacy could be increased. Many of these responses were aligned with one or more of the general sources of efficacy as presented by Bandura (1977), which include performance accomplishments, vicarious experiences, verbal persuasion, and emotional or physiological arousal. Some of these ideas were also echoes of previous research conducted on increasing teachers' self-efficacy (Salah, 2008; Vannatta & Fordham 2004). All participants expressed the need for more time to practice using instructional technology, which is not only tied to performance accomplishments but also to constructivist thinking as people learn and acquire knowledge through experience, or, people learn by doing (Jaramillo, 1996). Additionally tied to performance accomplishments was the finding that participants expressed the need for specialized training that built on itself overtime so as to allow them to grow their confidence and skill with regard to specific instructional technology tools and resources. According to Bandura (1977), performance accomplishments are especially influential because they are "based on personal mastery experiences" (p. 195). In regard to vicarious learning experiences, participants suggested the idea of collaborating with other teachers and observing other teachers as a way to grow their own confidence with technology. This type of vicarious learning experience can be beneficial because "seeing others perform threatening activities without adverse consequences can generate expectations in observers that they too will improve if they intensify and persist in their efforts" (Bandura, 1977, p. 197). Connected to emotional or physiological arousal, were those participants who expressed fears of technology not working or breaking when they use it,

which again, could be addressed through more training on instructional technology. According to Bandura (1977), situations that appear stressful can usually evoke emotional responses that may affect one's belief about his or her competency. By decreasing the fear teachers may experience when working with technology, which can be accomplished by providing them with opportunities to learn and practice, it is possible that teachers' technology self-efficacy would increase.

Limitations and Recommendations for Future Research

This case study focused on teachers' technology self-efficacy. Teachers' actual use and skill of instructional technology was not observed, so comparisons between teachers' technology self-efficacy as they perceived their own ability and confidence in regard to instructional technology and their actual ability to effectively use technology were not made. Therefore, it is recommended that future research make this comparison to identify what, if any, disparities exist between teachers' self-perceptions of their confidence in their ability to use instructional technology and their actual implementation or use of instructional technology. Classroom observations could provide researchers with important information that may reveal additional factors that influence teachers' technology self-efficacy.

Another limitation of this study relates to the participants. The research only included participants who were Caucasian and who taught in the same general area of the school district. Although participants were included from all three school levels, elementary, middle, and high school, the study was isolated to one cluster of the school district in terms of location within the district. Since the district is very large and contains

multiple clusters, the sample used for this study is not fully representative of the district as a whole. Future research could focus on participants of different ethnicities to determine whether culture plays a role in influencing teachers' technology self-efficacy. Additionally, researchers should include a sample of participants from different clusters within a large school district or include participants from multiple school districts, and the study might also look different if it were conducted in a rural school district or a poor district.

Because the purpose of this study was to investigate what factors influenced teachers' technology self-efficacy levels, teachers were not chosen based on the grade level or subject area they taught, nor were they chosen based on their age, gender, or years of teaching experience. Since some of these factors have been identified as influencing teachers' technology self-efficacy, it is recommended that future research concentrate on one or more of these factors to determine the degree to which these factors influence teachers' technology self-efficacy.

Another limitation of the study is that some of the participants were previous colleagues of mine and thus might have provided me with more candid information than those who did not previously have a relationship with me. In order to address this concern, future researchers could replicate this study but only include those participants with whom the researcher does not have a relationship.

Although participants were all employed by the same school district and all had access to instructional technology, the specific types of instructional technology at each local school differed, and thus may have impacted teachers' access to and opportunities

to learn about instructional technology. It is recommended that future research concentrate on schools that all have the same amount and types of instructional technology available to them so as to address this inconsistency.

It is important that, for my study to contribute to the educational field, it be deemed trustworthy. Credibility refers to the truthfulness of my inquiry findings. There must be a high level of confidence in my findings with respect to the degree to which those findings are honest, true, and accurate in order for my study to be deemed credible. Through member checks and outside feedback, the information collected and analyzed was seen and reviewed by multiple people, including the nine participants as well as an outside source. In terms of transferability, as a result of the thick descriptions provided in regard to participant characteristics, data collection and data analysis procedures, it is possible that the research findings could be transferred to other school districts if those districts possess similar characteristics in size, setting, structure, and resources and if similar steps are followed when conducting the case study.

Conclusion

The purpose of this case study was to identify factors that influenced teachers' technology self-efficacy. Several factors, including work-related and outside or personal factors were revealed as playing some role in developing one's self-efficacy. Increasing one's self-efficacy is important because efficacy deals with one's own perceptions of his or her ability, and a person's thoughts influence his or her actions. Research has shown that when people have high self-efficacy, they are more motivated to adopt certain behaviors (Henson, 2002).

Overall, the results in relation to SCT supported that various types of factors, including personal, behavioral, and environmental, contribute to the development of teachers' technology self-efficacy. Certain personality traits were identified as influencing one's technology self-efficacy. Additionally, behavioral factors were identified in this study as those who had advanced knowledge of instructional technology had higher self-efficacy than those who lacked knowledge of instructional technology. Finally, environmental factors were found to play a role as well. Participants also shared ways in which they believed their technology self-efficacy could be increased. These responses were aligned with several general sources of efficacy as identified by Bandura (1977), namely, vicarious learning experiences, physiological arousal, and mastery experiences or performance accomplishments.

The results of this case study revealed six implications that can aid educational stakeholders in helping teachers to increase their technology self-efficacy in efforts to enhance teachers' professional practice with the implementation of effective instructional technology use, which in turn may ultimately provide engaging and meaningful learning experiences for students. The first implication indicated that males tend to have higher technology self-efficacy than females. Given this finding, educational stakeholders need to find ways to build female teachers' confidence with instructional technology and make efforts to build females' perceptions of their own capabilities to learn and use instructional technology.

A second implication was that several identified factors influencing teachers' technology self-efficacy had a relationship to professional development, including

teachers' perception of local school support for instructional technology, teachers' knowledge of access to instructional technology in their school buildings, and teachers' beliefs about available professional development opportunities. The findings from this study highlighted the important aid local school support specialists provide teachers. Additionally, future professional development opportunities should focus on educating teachers about all that is available to them as a starting point to promote access to and teachers' use of instructional technology. Teachers could also benefit from leveled professional development opportunities.

The third implication of this case study suggested that current school structures and work demands may have hindered teachers' technology self-efficacy development. Thus, school leaders should think creatively about ways to restructure the work day so as to allow for planned time for teachers to learn such skills. The fourth implication was that barriers existed that prevented teachers from using instructional technology, which in turn, impeded the development of their technology self-efficacy. School leaders may need to re-evaluate how the funds for technology are currently being spent and involve teachers in this discussion to ensure funds are maximized in the areas of highest need and demand. Moving forward, it becomes increasingly important for district leaders to consider ways to lift some of the restrictions currently in place while still maintaining a secure learning environment for teachers and students. Also, local school policies and procedures were other barriers cited by participants. As a result of this finding, school leaders must continue to find ways to increase access for teachers to instructional technology tools and resources so they can learn how to use them effectively to enhance

student learning.

A fifth implication of the study was teachers' ideas for ways to increase their technology self-efficacy. Four ideas were identified (a) more targeted and specialized teacher training on instructional technology, (b) increased knowledge of and access to instructional technology tools and resources, (c) increased teacher collaboration with a focus on instructional technology, and (d) creating opportunities for teacher observations and demonstrations. There is a need for educational policy makers to make it a priority to develop and provide teacher training with the intent to increase teachers' confidence and capacity to use instructional technology effectively. The final implication of the case study was teachers' beliefs and attitudes toward instructional technology may have been positive, but that did not necessarily translate to having very high technology self-efficacy. School leaders need to go beyond communicating the advantages of instructional technology because many teachers already recognize the benefits; instead, school leaders need to concentrate on high-quality training for teachers in the area of instructional technology.

We know that technology is what is relevant to students today, and we know that we live in a digital world. Looking ahead to the future, it is imperative that educators equip students with the skills that will not only allow them to survive but also thrive in a global market. Before we can hope to build students' skills for the future, we must first focus on building the skills of those who have a significant impact on student learning, teachers. Educational stakeholders should take into consideration the implications and

recommendations of this research study as they attempt to make important decisions that will have far-reaching effects on the students and teachers of today and in the future.

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Appendix A

Liberty University IRB Approval Letter

Good Afternoon Amy,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. Attached you'll find the forms for those cases.

Thank you for your cooperation with the IRB and we wish you well with your research project. We will be glad to send you a written memo from the Liberty IRB, as needed, upon request.

Sincerely,

Fernando Garzon, Psy.D.
IRB Chair, Associate Professor
Center for Counseling & Family Studies

(434) 592-5054

40 Years of Training Champions for Christ: 1971-2011

Appendix B

Local School District IRB Approval Letter

June 1, 2011

Amy Farah
7868 Keepsake Lane
Flowery Branch, GA 30542

Re: File ID 2011-86

Dear Ms. Farah:
This is to advise you that your research proposal, “Factors Influencing Teachers Technology Self-Efficacy: A Case Study’” (File ID 2011-86), has been approved with the following comments and limitations:

- An improved understanding of self-efficacy factors in the use of educational technology would be valuable for Gwinnett and other districts.
- The instruments appear appropriate and sound for the purpose for which they are intended. The addition of interviews adds valuable depth to the study. Since survey respondents will not be anonymous, the linkage of a participant's survey responses with the same participant's interview responses should add needed information for the interpretation of the overall survey results.
- Consider the selection of interview participants using a stratified random sample with the strata defined by low, moderate, and high efficacy scores.

Please note that schools and teachers may elect not to participate in your research study, even though the district has granted permission.

Important: When contacting schools regarding this research, it is your responsibility to provide a copy of this approval letter to the principal. In addition, it is your responsibility to provide your sponsors and project officers or managers with a copy of this approval letter. **Be sure to use the file ID number issued above when contacting schools or district level personnel regarding this research study.**

Please forward a copy of your results to me when they are completed. Also, we would appreciate you providing us with feedback on the research approval process by completing the enclosed survey and returning it in the enclosed postage-paid envelope.

Best wishes for a successful research project. Please call me at (678) 301-7090 if I may be of further assistance.

Sincerely,
Colin Martin, Ph.D., Executive Director
Research and Evaluation
cc: Amy Farah, acfarah@liberty.edu
Dr. Gary Kuhne, garykuhne@me.com

Appendix C

Amy,

You have my agreement to use the CTI survey from my article toward your dissertation work.

Good luck to your study!

Ling

Ling Wang, Ph.D.
Associate Professor
Nova Southeastern University
Graduate School of Computer and Information Sciences
Room 4123, Carl DeSantis Building
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Web: http://scis.nova.edu/~lingwang

Appendix D

TRANSCRIPTION CONFIDENTIALITY AGREEMENT

Confidentiality Agreement for Transcription Services

As the hired professional for transcribing the interviews and focus groups for Amy Farah's doctoral study, by initialing next to each statement below and signing my name, I agree to the following:

1. ____I understand the importance of confidentiality and agree to maintain confidentiality of all interviews and focus group materials sent to me for transcription.
2. ____I will not share these materials with anyone outside our transcription services company, nor will I share any information regarding these materials with anyone outside our transcription services company.
3. ____I agree to keep all interview and focus group materials sent to me for transcription in a locked, secure location while they are in my possession.
4. ____I will be the only person who has access to the locked, secure location where materials are to be stored while in my possession.
5. ____Upon receiving the materials through certified mail/secured email and completing the transcription services, I will return the materials through certified mail/secured email to Amy Farah.
6. ____I will utilize secure, web-based access to complete the transcription services.

By signing my name below, I am stating that I have read, understand, and agree to adhere to all of the statements presented in this document.

Stuart Lucas Palder

Transcriptionist Signature

October 5, 2011

Date

Stuart Lucas Palder, CEO

Appendix E

COMPUTER TECHNOLOGY INTERGRATION SURVEY

Directions: The purpose of this survey is to determine how you feel about integrating technology into classroom teaching. For each statement below, indicate the strength of your agreement or disagreement by circling one of the five scales.

Below is a definition of technology integration with accompanying examples:

Technology integration: Using computers to support students as they construct their own knowledge through the completion of authentic, meaningful tasks.

Examples:

Students working on research projects, obtaining information from the Internet.

Students constructing Web pages to show their projects to others.

Students using application software to create student products (such as composing music, developing PowerPoint presentations, developing HyperStudio stacks).

Using the above as a baseline, please circle one response for each of the statements in the table:

SD=Strongly Disagree, D=Disagree, NA/ND=Neither Agree nor Disagree, A=Agree, SA=Strongly Agree

1.	I feel confident that I understand computer capabilities well enough to maximize them in my classroom.	SD	D	NA/ND	A	SA
2.	I feel confident that I have the skills necessary to use the computer for instruction.	SD	D	NA/ND	A	SA
3.	I feel confident that I can successfully teach relevant subject content with appropriate use of technology.	SD	D	NA/ND	A	SA
4.	I feel confident in my ability to evaluate software for teaching and learning.	SD	D	NA/ND	A	SA
5.	I feel confident that I can use correct computer terminology when directing my students' computer use.	SD	D	NA/ND	A	SA
6.	I feel confident I can help students when they have	SD	D	NA/ND	A	SA

	difficulty with the computer.					
7.	I feel confident I can effectively monitor students' computer use for project development in my classroom.	SD	D	NA/ND	A	SA
8.	I feel confident that I can motivate my students to participate in technology-based projects.	SD	D	NA/ND	A	SA
9.	I feel confident I can mentor students in appropriate uses of technology.	SD	D	NA/ND	A	SA
10.	I feel confident I can consistently use educational technology in effective ways.	SD	D	NA/ND	A	SA
11.	I feel confident I can provide individual feedback to students during technology use.	SD	D	NA/ND	A	SA
12.	I feel confident I can regularly incorporate technology into my lessons, when appropriate to student learning.	SD	D	NA/ND	A	SA
13.	I feel confident about selecting appropriate technology for instruction based on curriculum standards.	SD	D	NA/ND	A	SA
14.	I feel confident about assigning and grading technology-based projects.	SD	D	NA/ND	A	SA
15.	I feel confident about keeping curricular goals and technology uses in mind when selecting an ideal way to assess student learning.	SD	D	NA/ND	A	SA
16.	I feel confident about using technology resources (such as spreadsheets, electronic portfolios, etc.) to collect and analyze data from student tests and products to improve instructional practices.	SD	D	NA/ND	A	SA
17.	I feel confident that I will be comfortable using technology in my teaching.	SD	D	NA/ND	A	SA
18.	I feel confident that I feel confident I can be responsive to students' needs during computer use.	SD	D	NA/ND	A	SA
19.	I feel confident that, as time goes by, my ability to address my students' technology needs will continue to improve.	SD	D	NA/ND	A	SA
20.	I feel confident that I can develop creative ways to cope with system constraints (such as budget cuts on technology facilities) and continue to teach	SD	D	NA/ND	A	SA

	effectively with technology.					
21.	I feel confident that I can carry out technology-based projects even when I am opposed by skeptical colleagues.	SD	D	NA/ND	A	SA

Appendix F

PERSONAL INTERVIEW QUESTIONS

Participant Background Interview Questions:

1) How long and in what capacity(ies) have you been in education?
2) What subject area/grade level do you teach?
3) What type(s) of technology do you have access to at home?
4) What type(s) of technology do you have access to at work?
5) Describe the role technology has played in your life outside of education?
6) For what purposes do you use technology on a regular basis outside of work?
7) Do you enjoy using technology outside of work?

Focused Interview Questions:

1) How would you describe your attitude toward instructional technology in regards to its role in education as an instructional tool?
2) How or in what ways have you participated in training that targets the use of instructional technology?
3) How often do you use technology during the regular work day for housekeeping tasks/for instructional purposes?
4) What, if anything, challenges you/scares you about using technology in the classroom?

    --How and why do the things mentioned in #4 challenge you/scare you?
5) How often do you experiment with/take the time to learn new technology?
6) How important do you think technology is to education? Why?

7) How would you describe technology's role in education?
8) Do you think using technology is essential to students' future success? Why or why not?
9) What interests you about using technology in the classroom?
10) Do you consider yourself a risk-taker? Why or why not?
11) Do you feel you have adequate time during the regular school day to learn about technology to use in your classroom?
12) Do you feel you have adequate opportunities and/or time to learn about technology to use in your classroom through other avenues such as professional development seminars/workshops, conferences, summer sessions?
13) Do you feel instructional technology engages students more so than other methods of instruction? If yes, why or how?
14) Describe the local support you have with using instructional technology in your classroom.
15) Do you consider yourself an innovative person? Why or why not?
16) What more can you tell me about your experiences with instructional technology in relation to your teaching practice?

Appendix G

FOCUS GROUP QUESTIONS

Focus Group Ice Breakers:

1) What role does technology play in your everyday life?
2) What role does technology play in education today?

Three Key Questions:

3) What factors do you attribute to your comfort level with using technology in instruction?
4) What anxieties do you face with using technology in instruction?
5) What do you believe would help you feel more comfortable in using technology in instruction?

Summary Question:

6) Overall, how would you describe your attitude toward using technology in instruction?

Appendix H

CONSENT FORM

Factors Influencing Teachers' Technology Self-Efficacy: A Case Study
Doctoral Dissertation Research
Amy Farah
Liberty University
School of Education

You are invited to be in a research study of teachers' technology self-efficacy. You were selected as a possible participant because you are a certified teacher at the elementary, middle, or high school level of one of the school sites in the district chosen for this study. I ask that you read this form and ask any questions you may have before agreeing to be in the study.
This study is being conducted by: Amy Farah, School of Education, Liberty University

Background Information

The purpose of this study is to identify factors that influence teachers' confidence with using technology as an instructional tool in their classrooms. If I can identify factors that influence teachers' confidence with using technology in the classroom, then I can help local school and district leaders design staff development that will build teachers' confidence with using technology in their classrooms.

Procedures

If you agree to be in this study, I would ask you to do the following things:

- Complete a 21 item Likert-type survey.
- If, upon completion of the survey, you are identified as a teacher for the case study and you agree to volunteer, you will be asked to participate in one one-hour interview and one one-hour focus group with eight other teachers. Interviews and the focus group will be audio taped and transcribed for analysis. Interviews and the focus group will be scheduled at a time convenient for participants.

Risks and Benefits of being in the Study

The risks of participating in the study are minimal and are no more than the participant would encounter in everyday life.

The benefits to participation are that teachers will have the opportunity to share both their successes and struggles with using technology in the classroom in a safe and

confidential environment as well as provide input that may help local and district leaders plan meaningful professional development opportunities that have the potential to build teachers' confidence with using technology.

Confidentiality

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. Participants who agree to be interviewed via Skype should be aware that privacy cannot be guaranteed using this medium of communication. Participants who opt to have their interview conducted via Skype should be aware that Skyping in a public place places limits on confidentiality because someone may overhear the interview. In order to protect participants' confidentiality, participants should Skype in a private place. Additionally, as the interviewer, I will conduct any Skype interviews in the privacy of my own home by myself.

I will store all data in a file cabinet that will stay locked in my own home, and only I will have a key to this cabinet. Research related data will be maintained for three years. Once the recordings have been used to prepare an analysis of results and each of the nine participants have completed their member check, the recordings will be destroyed. Only members of the dissertation committee and a Liberty University research consultant will have access if it is requested. For the focus group, although I cannot assure other participants will maintain a subject's confidentiality, it will be explained in person to all participants that they are asked to respect others' privacy and refrain from discussing any of the content of the focus group as well as mentioning any names of those involved in the focus group to anyone outside of the focus group.

By signing your name below, the participant agrees to uphold the confidentiality of this study, including the content discussed in interviews and the focus group as well as any identifying information of any of the other participants.

The following people will have access to the data throughout the study:

Myself as the researcher

The Dissertation Committee

Transcriptionist

One colleague who will provide outside feedback of identified themes/coding

Voluntary Nature of the Study
Participation in this study is voluntary. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions
The researcher conducting this study is Amy Farah. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact me at the Instructional Support Center or at home, (W#) 678-301-7369 or (H#) 404-408-6991, amy_farah@gwinnett.k12.ga.us or acfarah@liberty.edu. You may also direct questions or concerns to the chair of the research committee, Dr. Gary Kuhne, gwkuhne@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, Dr. Fernando Garzon, Chair, 1971 University Blvd, Suite 1582, Lynchburg, VA 24502 or email at fgarzon@liberty.edu or irb@liberty.edu.

You will be given a copy of this information to keep for your records.

Statement of Consent:
I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

☐ Yes, I agree to be recorded in the interview and focus group.

☐ No, I do not agree to be recorded in the interview and focus group.

Signature:_____ Date: _____

SIGNATURE OF INVESTIGATOR:_____ DATE: _____

Appendix I

SAMPLE INTERVIEW TRANSCRIPT

Personal Interview 1 of 9; 1 of 3 @ high school level. 1 of 3 for low-to-medium self-efficacy.

SPEAKER 1: All right. This is Wednesday, September 21. How long and in what capacity have you been in education?

PARTICIPANT 1: I have been a high school language arts teacher four full years. I'm beginning my fifth year.

SPEAKER 1: OK. And that answered what subject area. What grade levels do you teach?

PARTICIPANT 1: I did one year of 10th grade, but mainly I focus on 9th grade. The past four years.

SPEAKER 1: What types of technology do you have access to at home?

PARTICIPANT 1: At home I guess I mainly use the computer. We have our own laptop and sometimes I bring my school laptop home because it's faster, and then cell phone. I guess that's about it, besides the TV and PlayStation 3.

SPEAKER 1: What do you use the computer for, mostly?

PARTICIPANT 1: Checking email and then now I'm getting my master's online. So grad school. That's why I bring home the nicer one sometimes, because it goes faster than our old one.

SPEAKER 1: So you're getting your master's online. Is it completely online?

PARTICIPANT 1: Mm-hm.

SPEAKER 1: OK. So you have to like go through like modules and do discussion boards and things like that?

PARTICIPANT 1: Yep. Posting and everything.

SPEAKER 1: And submitting assignments, all online.

PARTICIPANT 1: Everything is online.

SPEAKER 1: OK.

PARTICIPANT 1: So the computers have to work so I can make sure things are turned in on time.

SPEAKER 1: OK. How far along are you in your master's program?

PARTICIPANT 1: We are finishing two classes this fall, two in the spring and four next summer.

SPEAKER 1: OK.

PARTICIPANT 1: We're done by August.

SPEAKER 1: And where are you getting it?

PARTICIPANT 1: Georgia Southern.

SPEAKER 1: Oh, OK. I spent some time there.

PARTICIPANT 1: Matt is, too.

SPEAKER 1: Oh, that's cool. What are you getting it in?

PARTICIPANT 1: Kinesiology.

SPEAKER 1: So is that for like PE?

PARTICIPANT 1: Coaching. It's for coaching.

SPEAKER 1: Or coaching. It's for coaching.

PARTICIPANT 1: Yeah.

SPEAKER 1: Oh, OK.

PARTICIPANT 1: But there's a lot of data and like we're in a bunch of research classes right now, so I feel like I'm actually learning a lot, but this class has been hard.

SPEAKER 1: Are you having to do… so a lot of the research, is it done via the Internet?

PARTICIPANT 1: It's all e-journals, like the project I had last night was an e-journal having to research and looking for quantitative and qualitative articles and reading through. So yeah, that's all, all online.

SPEAKER 1: I'm collecting qualitative data.

PARTICIPANT 1: Yes.

SPEAKER 1: As we do this, of course.

PARTICIPANT 1: Yes.

SPEAKER 1: OK. All right. So what types of technology do you have access to at work?

PARTICIPANT 1: Pretty much the same. I guess laptop, and we have nice LCD projectors that I use a lot. I'm always putting stuff on the nice overhead. I guess that's the main thing that I use.

SPEAKER 1: OK. Do you use DVDs or...?

PARTICIPANT 1: Yeah. The DVD goes straight to the LCD projector, like there's no TV or anything so it's all hooked up. So yeah.

SPEAKER 1: So no need to use TV anymore really?

PARTICIPANT 1: Nope. It all goes through the projector.

SPEAKER 1: OK.

PARTICIPANT 1: It all hooks up right to my laptop. So yep. It all goes to the same place.

SPEAKER 1: Do you utilize the Internet? Like YouTube or any of those types of things?

PARTICIPANT 1: Yeah. I actually did on Friday. We had the School Reads thing where the kids picked a book, and for my book we actually Skyped with the author. So I set up the Skype and he met us online. At 8:30 he called us and so the kids got to come to the desk and ask him questions or whatever. So then we watched the YouTube for the trailer… we used YouTube for the trailer for the video that goes with the movie that was made. That was just one instance. Yeah. I use YouTube all the time.

SPEAKER 1: OK.

PARTICIPANT 1: It's nice because we have access to it. Now I don't have to change it over.

SPEAKER 1: Right. Because that used to not be the case?

PARTICIPANT 1: Mm-hm. Teachers now can use it.

SPEAKER 1: OK. Describe the role technology has played in your life outside of education, and by that I mean like outside of teaching.

PARTICIPANT 1: Cell phones.

SPEAKER 1: So for purposes of like communication**,** you would think?

PARTICIPANT 1: Communication with friends. Cell phones using text messaging. When people are in different states. All my friends live in other states so I have free long distance so I can talk to them easier.

SPEAKER 1: Do you Skype?

PARTICIPANT 1: That was the first time I had Skyped, on Friday.

SPEAKER 1: OK.

PARTICIPANT 1: He actually offered and I said, OK, I'll figure it out. Sounds good. Let's Skype. But now that I know how and how simple it is, I absolutely want to use it because I have lots of friends in different places. I guess cell phones and laptops, you know, Facebook and your email.

SPEAKER 1: OK. Facebook, email.

PARTICIPANT 1: Something we all use.

SPEAKER 1: Mm-hm.

PARTICIPANT 1: And so I can do that outside school, obviously.

SPEAKER 1: And then you're now… I mean, you're depending on...

PARTICIPANT 1: We don't have a landline. So like my cell phone is… we tried to get a landline here at the new house and we never used it and it was only telemarketers. So just cell phones, that's our communication.

SPEAKER 1: Right. It's the same for us. And then now you're depending on the Internet for your master's degree as well?

PARTICIPANT 1: Oh yeah. I'm on the computer all the time typing up stuff. Everything has to be posted to the website or to Google, the documents. Everything is...

SPEAKER 1: Do you all use Google Docs?

PARTICIPANT 1: Mm-hm.

SPEAKER 1: OK.

PARTICIPANT 1: Our research class.

SPEAKER 1: For what purposes do you use technology on a regular basis outside of work, and it sounds like we kind of already answered that—the cell phones, the Facebook, master's degree. So all of those things. Would you add anything else to that?

PARTICIPANT 1: iPod.

SPEAKER 1: OK.

PARTICIPANT 1: I don't use it as often as some people, but iPod to listen to music, download stuff.

SPEAKER 1: OK.

PARTICIPANT 1: In the car especially.

SPEAKER 1: All right. Do you… would you say that you enjoy using technology outside of work?

PARTICIPANT 1: Yes. For the most part, until I started my master's I didn't bring my computer home as often. I tried to leave all the work at school but now I need it, so yeah.

SPEAKER 1: So, when you say… OK, so let me ask you this question. Do you enjoy using technology outside of work for non-work related things?

PARTICIPANT 1: Yeah. Yeah. Cell phone. iPod. Again Facebook. Yes.

SPEAKER 1: Right. OK. All right. So now we're going to move into some questions that are very… are more specific to like the survey that you filled out. So you might hear some similarities to the survey. And my goal is to kind of understand where your… depending on, like based on your confidence level, what factors developed your confidence level with technology?

PARTICIPANT 1: OK.

SPEAKER 1: So how would you describe your attitude toward instructional technology in regards to its role in education as an instructional tool?

PARTICIPANT 1: Well, kind of like I was talking about. I've been able to be more relevant to the kids by using YouTube and Skype. You know, most of them had never used it. They were blown away that we could actually talk to an author and do things like that, and so being able to make things more relevant because kids do use their cell phones and are on YouTube and Facebook all the time, so oh yeah. I think relevance is probably…

SPEAKER1: And so you would say you have like a positive attitude toward…?

PARTICIPANT 1: Mm-hm.

SPEAKER 1: OK. And so you believe that instructional technology can be used as an instructional tool?

PARTICIPANT 1: Yes.

SPEAKER 1: OK. So, to be more relevant. Would you say there are any other, I guess, ways that it can be an instructional tool other than helping to make learning relevant?

PARTICIPANT 1: Well, like we have to take certain data for different classes. We're making tests online using different programs so it can be graded faster or, you know, statewide tests are online. So they're having to use the computer so we practice that, to typing essays. Yeah.

SPEAKER 1: OK. How or in what ways have you participated in training that targets the use of instructional technology?

PARTICIPANT 1: Well, Amy **(unintelligible - 0:08:41.8)** has led several different instructional technology lessons. Teachers at school, to professional development, mainly.

SPEAKER 1: OK.

PARTICIPANT 1: Using like Movie Maker and learning how to use Elluminate so you can use it in a classroom. It's basically professional development, I

guess. I mean, I know how to use a computer and Word and the basics just from college, but I'd never done as much until I got to our school.

SPEAKER 1: OK. So you would say there's a strong focus on technology for… like in terms of professional development offerings?

PARTICIPANT 1: Yes.

SPEAKER 1: And like last year we were allowed to choose which ones we wanted to focus on, so now I know how to use Movie Maker; I didn't need to go to another Movie Maker session. So it was nice to be able to choose but I didn't know how to use Elluminate so I could go learn how to do that.

SPEAKER 1: OK. Beyond those offerings at Our school, have you participated in any type of training that targets instructional technology?

PARTICIPANT 1: No, other than my master's. I'd never used Google Docs and basic stuff like that.

SPEAKER 1: OK.

PARTICIPANT 1: But no.

SPEAKER 1: And with your master's were you trained on how to use Google Docs?

PARTICIPANT 1: Mm-hm.

SPEAKER 1: Oh you did? You were trained. OK.

PARTICIPANT 1: This summer I think we sort of had the prequel classes before we got into like the… we had a pre-research class before we actually got into this class. So we learned how to do some on the basic technology things she would want us to do.

SPEAKER 1: OK. How often do you use technology during the regular workday for housekeeping tasks? Yes, that's the first part of the question. So for housekeeping.

PARTICIPANT 1: Taking roll. Checking basic email kind of thing.

SPEAKER 1: Taking roll. Checking email. Yeah. Those things versus instructional purposes. Or instructional tasks.

PARTICIPANT 1: I mean, I'm trying to do it like per hour. Taking roll takes one minute. Going through your email to see if anything's needed what, maybe couple of minutes, maybe five, at the tops I guess. Just for...

SPEAKER 1: A day?

PARTICIPANT 1: No. Per period.

SPEAKER 1: Oh, per period. So you would say...

PARTICIPANT 1: Half an hour.

SPEAKER 1: At least once or twice an hour?

PARTICIPANT 1: Yeah.

SPEAKER 1: OK.

PARTICIPANT 1: Checking to make sure there's nothing important I need to send a kid or, you know, looking for somebody or… I don't know.

SPEAKER 1: OK.

PARTICIPANT 1: Then taking roll.

SPEAKER 1: OK. And then, during the regular workday how often would you say you use technology for instructional purposes like, for example, do you, is that a part of your everyday?

PARTICIPANT 1: Pretty much. My projector is up at least, because I have different levels of classes so I might be doing something different. But like today it was up for only 20 minutes for three class periods, but they were taking some notes.

SPEAKER 1: So you use it like for PowerPoint, for notes?

PARTICIPANT 1: Mm hm. Anything that I can quickly put up there to show them, whether it's a video or to show them like a funny email went around about using the one word ‘alot.’ The ‘alot’ monster. So I just showed them that quickly today just to see how silly it is. They think it's one word so yeah, anything I can put up to show them.

SPEAKER 1: Connected to the content?

PARTICIPANT 1: Mm-hm.

SPEAKER 1: OK. What, if anything, challenges you or scares you about using technology in the classroom?

PARTICIPANT 1: I guess anything I've never used. The lack of knowledge. Like if I'd never used like Movie Maker, because until I've done it and feel comfortable teaching kids how to do it, of course I'm going to be nervous about it. So I'm not going assign a huge project when I don't feel comfortable because I can't help them. I can't talk them through it, I guess, if they do get stuck. Just making sure that I understand it first before I assign it to them.

SPEAKER 1: So the not knowing how to troubleshoot?

PARTICIPANT 1: Right.

SPEAKER 1: Or provide them with like support when they're going through it?

PARTICIPANT 1: So like even this year we got new computers, so now when everybody was sending their emails home after we worked on their lab, nobody's would open because they were all saving as in the new format and most people at home don't have it. But I know how to troubleshoot that so I could say, OK, we're going to go in and save in the old way and you should be able to open it.

SPEAKER 1: OK.

PARTICIPANT 1: Just things like that I wouldn't have known what to do unless I… but I've used it so I knew how to work it.

SPEAKER 1: So as long as you feel like you've had a chance to experience it or practice it, you feel comfortable with it.

PARTICIPANT 1: Mm hm. I think it's just like teaching anything. If I'm going to have the kids do it, I want to make sure I can answer all their questions and I know. I mean, if a kid is more, if they… if I've never used a program and they know how to use it and they're comfortable doing it for a project and know how to troubleshoot then I would let them use it, but...

SPEAKER 1: But you wouldn't assign that as like a software that all students would use.

PARTICIPANT 1: Right.

SPEAKER 1: Mm hm. How often do you experiment with or take the time to learn new technology like of your own accord, would you say?

PARTICIPANT 1: Not that often.

SPEAKER 1: OK.

PARTICIPANT 1: Professional development. I'll go to some and if I'm interested in it but I guess on my own. But Skype, I guess, was on my own on Friday.

SPEAKER 1: Yes, it was. That's very true. And it's so easy. It was easy, wasn't it?

PARTICIPANT 1: It was so easy. The computer guy, helped me like kind of get set up but once I actually got the… it was so easy; I couldn't believe how easy it was.

SPEAKER 1: I know it's not… and the picture… Or did you have a webcam?

PARTICIPANT 1: Yes. I went and bought one because the school doesn't have an updated one because, all of the new computers I said I'm willing to buy it. If this guy is going to Skype with me I will go pay the money and so I went and bought one and it was perfect. It was fun.

SPEAKER 1: That's awesome. I know it was neat for the kids, too. How important do you think technology is to education today and why? Like why do you… like if you think it's very important, why, if you think it's not important, why.

PARTICIPANT 1: Very important. I mean, it goes back to what I was saying in that other question. Just the relevance that we're now in this generation where kids are on Facebook. They're on Twitter. They're communicating using the Internet and texting, so using technology in the classroom just makes them more comfortable because they probably know more about it half the time than we do. So again, it makes it more relevant.

SPEAKER 1: OK. How would you—and let me know if you need me to clarify this. How would you describe technology's role in education, meaning like what do you feel is a purpose, or… How would you describe technology's role in education, meaning do I guess like do you feel like technology has a… almost like what service does it have to provide to people in education in terms of like, I guess, preparing them? Does that make sense?

PARTICIPANT 1: Yeah. Well, I guess like I'm having to do… I'm getting my master's degree, I'm furthering my education through an online course and so I'm familiar with using this format online. I'm familiar with doing things and so I guess in education the kids need to be used to that because it is going to be used in the work field or furthering their education. Does that kind of…?

SPEAKER 1: Mm-hm. Yeah. I mean, yeah. That makes sense.

PARTICIPANT 1: So that's one thing.

SPEAKER 1: So and the fact that online programs are more popular now, you would say?

PARTICIPANT 1: Mm-hm. Well, and there's work, too. Like my dad works for a really big company so almost all of his meetings…

SPEAKER 1: Are teleconferenced?

PARTICIPANT 1: Are teleconferenced or, he works for Cisco and they're actually trying to buy Skype because they really believe it's such a great idea and so they do the teleconferencing and so you've got to be able to use that technology.

SPEAKER 1: Oh, wow. Okay. So workforce… it's just needed.

PARTICIPANT 1: Yeah, just the way the world is going, you know, to communicate rather than traveling across the world just –doing it over the phone or a teleconference. Things like that.

SPEAKER 1: So you feel it's necessary for technology to be a part… I guess, to be a part of education as a result of what students are going to be required to do when they leave?

PARTICIPANT 1: Well, that's what we're doing in high school is trying to prepare them for the future, and so technology is being used in the future in the work fields so we need to get them used to using it.

SPEAKER 1: Okay. All right. Do you think using technology is essential to students' future success? Why or why not.

PARTICIPANT 1: Hm. I mean, I guess. That's hard. I guess no because there have got to be jobs out there where you're not actually going to have to be great at typing on Word or you have to… some people do not text and are still, you know, savvy people and they'll do well in life. So I don't, I guess then no. There's got be people out there that don't .

SPEAKER 1: Okay. So a student could… so it's possible that a student could graduate without those technology skills and still survive is what you're saying?

PARTICIPANT 1: Sure, be a mechanic or… well, mechanics use computers a lot. So I don't know. Probably not, I guess.

SPEAKER 1: I mean I'm not… it's not a trick question I'm just making sure I understand.

PARTICIPANT 1: No, I guess I'm trying to think what people, what wouldn't, but even a mechanic they're using computers to figure out what's wrong with the engine. I guess to a certain degree. Not every kid needs to be completely computer savvy or text savvy. But they do need to know, I think, basic skills, I guess.

SPEAKER 1: OK.

PARTICIPANT 1: I cannot think of a profession where you're not having to use some sort of technology.

SPEAKER 1: OK. What interests you about using technology in a classroom? And then… I mean, it sounds like…

PARTICIPANT 1: Just making learning more fun, more interesting, rather than just lecture and notes. Doing anything to be different.

SPEAKER 1: OK. All right. So this is kind of switching gears just a little bit, this question, I think. Do you consider yourself a risk taker?

PARTICIPANT 1: No.

SPEAKER 1: OK. Why?

PARTICIPANT 1: I guess kind of going back to what I was saying. If I'm not as comfortable with something in life, if I don't know how to troubleshoot it, I don't know how to navigate, I'm probably not going to go out on a limb too far.

SPEAKER 1: OK. And that's because that makes you uncomfortable?

PARTICIPANT 1: I'd feel unconfident in what I'm doing. Like the project I was working on last night, I was not confident. I was getting very upset.

SPEAKER 1: OK.

PARTICIPANT 1: I couldn't figure it out and my husband could figure it out faster than I could. I like feeling like I know what's going on.

SPEAKER 1: OK. Do you feel you have adequate time during the regular school day to learn about technology to use in your classroom?

PARTICIPANT 1: No.

SPEAKER 1: OK. I guess…

PARTICIPANT 1: Do I need to elaborate?

SPEAKER 1: Yes. And that's my fault. Yes. The follow-up question.

PARTICIPANT 1: No. I hate to always use coaching, but being in season immediately after school I'm in charge of 30 more kids for two-and-a-half more hours. And then now I'm getting another degree, you know, I might have to go home and do more stuff. And then at school you really only have one planning period where you could go but half that you're

actually planning and grading. Being an English teacher you've got lots of grading and then, you know, you're collecting data for RBS or you're doing data for the school or there's always, you know, you have a conference or there's… I would say it's not high on the list of priorities.

SPEAKER 1: OK. Do you feel you have adequate—and this may kind of cross over into what we just talked about but do you feel you have adequate opportunities and/or time to learn about technology to use in your classroom through other avenues such as professional development seminars, conferences, or summer sessions?

PARTICIPANT 1: Yeah. The opportunities are there. Our school does a good job of providing lots of different opportunities for lots of different professional development. Do I necessarily always go to them or go outside the box to find the time unless it's mandatory? No, Because I do feel like I have a pretty good… I'm young enough still that I… I'm not old, things haven't passed me by.

SPEAKER 1: OK.

PARTICIPANT 1: I know how to use a computer and how to do most things. But yeah, the opportunities are there for us.

SPEAKER 1: OK. Just four more questions. Do you feel instructional technology engages students more so than other methods of instruction?

PARTICIPANT 1: Just like any strategy, as long as you don't do it every single day then yes. If I'm doing PowerPoints every single day and that's all that I do, then no. Switching it up, including instructional technology every other class period or something, I think. But I think PowerPoint is especially is one of those things that's become overused and it's not as different and unique as I think it once was.

SPEAKER 1: OK. So you do say that as long as it's not being used every day and it doesn't become like a rote type thing that you say it does engage

students more so than other methods. Why do you think that is? Or how does it achieve that, do you think?

PARTICIPANT 1: Yes. I guess again because education is usually sitting there with your paper, your pencil and writing so anything that's different… kids like technology, like Facebook, Twitter, so you can do anything on the projector. Anything in the lab that just seems different to them and anything different. Sitting in a circle is different; that's good for them. Anything different. So technology, I don't know; using it in any format is good for attention.

SPEAKER 1: OK. Describe the local support you have with using instructional technology in your classroom. You've talked a little bit about it.

PARTICIPANT 1: **(Unintelligible 0:22:56.0)**

SPEAKER 1: Yeah. About that in terms that local support could include, yes. Like the LSTC, media specialist, anyone who kind of works with technology. And then the PD opportunities would also count as a way that supports.

PARTICIPANT 1: Our school is wonderful at that. LSTCs are wonderful. When I emailed him talking about that Skype session with the author; the author emailed me Wednesday morning finally returning my email and said, well, I cannot just reply to your email, why don't we do a Skype session. I immediately forwarded it. He was down in my room 20 minutes later… actually it was Thursday morning. The day before. He took my computer, figured it out, did whatever I needed. The media specialist searched all day trying to find a webcam. They're always willing to help whenever I'm doing a project. They put all my projects on their website so kids have access to it. They're wonderful. And then again, I've said it before, professional development we have plenty of opportunities at our school. I don't know how other schools

do it, but some of our stuff is required, but again the opportunity's there.

SPEAKER 1: Opportunities are there. OK. So again, more of a general question like the risk taker question a little bit. Do you consider yourself an innovative person? So, someone who's creative or trying to find new ways of doing things?

PARTICIPANT 1: Most of the time I would say no; as far as education goes I try to be. I think I am more in the education world.

SPEAKER 1: OK. So specifically in the context of teaching?

PARTICIPANT 1: Yes. I try to. I never just use the same thing twice. I'm always trying to make it better and change it, see how it can be revised or… the book **(unintelligible 0:24:40.9)** keeps coming to my mind, I said I don't want to sit here and talk in a book circle with these kids. I don't even know if they read the book. What can I do that would possibly be different and so, yes. I try to be.

SPEAKER 1: But in, you would say like aside from teacher you would say you don't necessarily like you don't think that would be one of three words that people would use to describe you?

PARTICIPANT 1: No. Absolutely not. (Laughter)

SPEAKER 1: OK. It's OK. OK. When you do it in teaching… when you try to be innovative for teaching purposes, what do you feel like is the motivation behind that? Like why do you… like if you would say that's not something that describes you outside of education, why do you feel like that's different for education, for your teaching?

PARTICIPANT 1: Because I guess that's my goal as a teacher is trying to make my class evolve with my kids. I have different kids every class period, every semester, different levels of kids, so anything I can do. And I've only been teaching four years. So I'm improving on strategies. I'm learning new things and trying to put them to work in the classroom. If I know

something will work better, why not try it? Why not make it better if it's better for the kids?

SPEAKER 1: Mm-hm. OK. And then just as a final question, kind of leaving it open ended a little bit. What more can you tell me about your experiences with instructional technology in relation to your teaching practice? So I mean just anything you would want to offer as additional information in terms of technology in your teaching, if there's like an experience… I know the Skype thing sounds like it was a very positive experience. Are there other experiences that you've had that are not positive or that are also positive that have made you feel like this is something, or has something happened where you're like, oh, that was a disaster or like I don't feel comfortable doing that again because it didn't go well, that you can recall?

PARTICIPANT 1: I'm trying… two other parts, I guess, that all teachers use at our school, our Parent Portal has been wonderful because now teachers can see the grades, that keeps me on task, on taps with grading, make sure your grades are going in on the website. Having to maintain a website, I know other schools are finally starting that, again that helps with cleaning and the kids can always go there. So, those are two good things, Parent Portal is good, maintaining our website. I think one year I gave a Movie Maker project where they all had to do it and some of them were not computer, you know…

SPEAKER 1: Literate.

PARTICIPANT 1: …people and really struggled with it and it required a lot of, a lot a lot of extra work. And so now, on projects I'll provide it as an option. If you know how to use it or you want to try it, I'm willing to work with you.

SPEAKER 1: So when that happened…?

PARTICIPANT 1: Some kids are not good at that. They struggled and made it way more complicated than it needed to be.

SPEAKER 1: So when some kids struggled with it, how did that make you feel as the teacher? Did you feel like you had the tools to help them? Did you feel like at times you…?

PARTICIPANT 1: Initially I didn't know. I didn't know why things weren't saving the right way or why they weren't showing up, and then once I figured it out, I could explain it. But again I'd never really done the project before so I just learned I'll give it as an option. Some kids are way more comfortable with that stuff. They love doing it. Some kids would rather write an essay. So why not provide them with the option if they can do pretty much the same type of work? So what I want to say it wasn't completely negative but I just learned I can't force… I guess I can't force them to use all these technologies.

SPEAKER 1: OK. And you said you did that a couple of years ago?

PARTICIPANT 1: Yeah.

SPEAKER 1: And you have not tried that since?

PARTICIPANT 1: Right. The same… I don't force them to do it. I usually provide it as an option.

SPEAKER 1: So you do do something now that still provides that as an option for them to do?

PARTICIPANT 1: Yes. When they do, say, do a book project and one of them is , is allowed to do Movie Maker. A lot of kids do. I've had kids use other computer programs and…

SPEAKER 1: Create.

PARTICIPANT 1: And create videos and do things and they're more than welcome to do that. But yeah, the one time didn't go so hot.

SPEAKER 1: OK. All right. Is there anything else that you can think of just in terms of like your confidence level, I'll tell you. I'm not sure if you

know or if you're able to figure out your confidence level, but your confidence level was on the lower end.

PARTICIPANT 1: Mm hm. Yeah.

SPEAKER 1: OK. So is that surprising to you?

PARTICIPANT 1: No. I mean just talking about like Skype… it's so easy but I'd never even tried it because it seems like oh you got to get the video or you got to set up all this stuff. That's not for me. I guess that has to do with my personality. I just want to be confident in what I'm doing and so technology, if I've never done it, well then I'm not going to really deal with it because it's not affecting me. But now that I know how to do it I'm almost kicking myself because there's so many ways I could use that, or use it in the classroom in other ways. So no I'm not surprised because I know that if I'm not comfortable doing it, I'm not going to go out on a limb. Like I said, I'm not a risk taker to go out.

SPEAKER 1: Right. So what would you, if you had to… what do you think would help build your confidence with technology? I mean, certainly we know like your personality isn't a factor that can change, but in terms of factors or variables that are in your control?

PARTICIPANT 1: Well, I think in… like an undergrad there was one just a computer class where we had to do the projects. So whether I wanted to use a certain project, Excel, to do whatever… even if I wasn't comfortable with it I had to do it for school. So I don't want to say I don't want to be required to do something, but I had to muddle my way through. I had to learn to troubleshoot. I had to figure it out. But now that I'm an adult, you can just kind of avoid it if you don't need it, which sounds bad but it had never…

SPEAKER 1: If that's what it is, that's what it is.

PARTICIPANT 1: Right. Yeah. We're about to get a new **(unintelligible 0:30:49.5)** Pro and that makes me nervous because, oh goodness. You know, I finally

feel confident after four years. I know how to do all the stuff. I know where everything is. I can do it all. And they say that's going to be coming out in the next year. That's just a whole 'nother headache, it seems like.

SPEAKER 1: But as long as they train you on it, you feel like you'll be OK?

PARTICIPANT 1: Right. But they can't… and as far as training goes most of the time you have one class period, so 55 minutes. They can go over the basics. They can go over, you know, but they cannot go through every possible scenario. So even like my first year teaching, you're sitting there the first week before pre-planning and they're going over, here's how you use Lotus Notes, here's how you print to the Savin and they're giving you the rundown, but I've never done it. So you can give me all the handouts you want, but until I've actually had to do it and produce something and actually print to the printer…

SPEAKER 1: So you feel like it was a lot of, here's the dissemination of information; it's up to you to try it out, practice, learn it at your leisure, basically?

PARTICIPANT 1: Right. And after you print 500 copies the wrong way you learn how to do it. But I'd never done that.

SPEAKER 1: But not without frustration.

PARTICIPANT 1: Right. And that was fine but there was really no way for them to teach us, I guess, until you actually tried, and that's how life goes. But I think until you actually do it…

SPEAKER 1: But if you weren't able… so, OK. So having more time to practice it would be something that would help you build your confidence?

PARTICIPANT 1: And produce something… actually see here's how you use Movie Maker and go through. I think you had us do that. And we had to do like two or three slides, go through, oh, it's the **(unintelligible - 0:32:27.4)** here or press play here's the movie. I actually see that I've

done it. Like again with the Skype on Friday, I was terrified so I said can we do a trial run like Thursday night? And he said absolutely. So we got on. I could see him, it worked and that so the next day I was like, oh, this will be fine. I knew how to do it, it worked, I practiced it and if I hadn't I would have been terrified on Friday morning, but it worked.

SPEAKER 1: OK. All right. Well, I think that's everything. So thank you so much. And this is the end of my first interview./AT/pa/mb/sg/

Appendix J

SAMPLE FOCUS GROUP TRANSCRIPT

Middle School Focus Group

SPEAKER 1: All right, this is the Jones Middle School focus. Thank you all for coming. It's November 9, 2011.
Some kind of background questions: What role would you say technology plays in your everyday life? What role does it play? How do you see it as part of your daily life?

SPEAKER 2: I feel like I'm on technology all the time. Between something, I mean, with the computer or at home, my cell phone, Kindle, or whatever else, I feel it's constantly around me. I'm always connected, I feel like.

SPEAKER 3: In the media center the kids are always on the computer, teachers needing equipment, needing troubleshooting, my own kids needing help.

SPEAKER 1: You're talking about here, right?

SPEAKER 4: At school I feel like I'm fairly well connected; at home, not so much. I don't spend a lot of time on a computer at home, and I don't have a smartphone, and I kind of like it that way because I'm not immediately accessible. So that's kind of a good thing.

SPEAKER 2: That's one thing we didn't do, we haven't done the smartphone thing, just because I feel like I'm already so connected.

SPEAKER 4: Someone did give me a Kindle though. You mentioned the Kindle. I love my Kindle.

SPEAKER 1: I think I would like that.

SPEAKER 2: But my Kindle doesn't…

SPEAKER 3: Did you know you can download now onto Kindles from the public library?

SPEAKER 4: No, I did not.

SPEAKER 3: Angelette told me that.

SPEAKER 1: So that's for free, then?

SPEAKER 3: Yeah.

SPEAKER 2: Yeah, right?

SPEAKER 1: I used mine, you know, I had to buy stuff.

SPEAKER 4: You can download a book for free through the library?

SPEAKER 2: Yeah. And if you're an Amazon Prime member, you can use through Amazon for free as well, a bunch of books.

SPEAKER 3: That's awesome.

SPEAKER 1: And then on the iPad, they have a Kindle app. So you can use it, that's my understanding. Yeah, I experienced the iPad a couple of weeks ago, and I said I absolutely do not need one until this process is done, because this process will not get done if I have an iPad because of all the games that were fun to play.

SPEAKER 2: Yeah, we've done that, and we got rid of texting, too, a year and a half ago.

SPEAKER 1: How's that been?

SPEAKER 2: It's all right. It's kind of funny to see how easily your relationships aren't quite as stable as you thought they were when you get rid of the texting. People won't communicate with you if you don't text. It's been funny how some of my friends…

SPEAKER 1: That's interesting.

SPEAKER 3: We got texting just to keep up with the kids. I mean really, like if they're in the, meetings and I'm outside. I'm here I can pick you up, you know, that kind of thing.

SPEAKER 2: Yeah I definitely would, and with our having a foreign exchange student, now I wish I had texting again, but just for me and my husband, really.

SPEAKER 1: I don't text a whole lot with my husband either.

SPEAKER 2: I'm sure if I had kids, I would.

SPEAKER 4: No, we have texting, and we got it during the whole hospital thing. Because one of us would be at the hospital, and one of us would be working. And we'd be back and forth, and it would be through that way. And we'd text occasionally, but not certainly all day long.

SPEAKER 1: Like my own children, they do the Facebook thing a little bit. But the texting is constant. They never talk on the phone at all.

SPEAKER 2: That's what I'm saying, that's how I was. Like in college, I mean when I had texting, almost all of my conversations were through texting. I would rarely actually call somebody. That's why I was saying that when I got rid of texting, I had twelve bridesmaids. I have always had a lot of friends, and then when you get rid of texting, it's like I may talk to these people every few months now because they don't call on the phone. Like if I don't have texting…

SPEAKER 1: People do Facebook but they don't do email.

SPEAKER 2: Right, exactly. Yeah. On Facebook sometimes, or it's just like they are really bad at communicating if we don't use technology for it. It's really irritating at first when I got rid of the texting. Like okay, I'm still your friend. You just have to communicate with me a little bit better, like we used to do in the old days.

SPEAKER 1: Right. That's interesting though. What role does technology play in education today in your opinion?

SPEAKER 3: Well, I think it's used -- what I've seen in the media center, it's used a bit more for presentation of learning, as proof of learning.

SPEAKER 1: Used for presentations rather than proof of learning? Is that what you're saying?

SPEAKER 3: Well, they're product. It's used to present their product of learning a little bit more so than actually used to learn, is what I see. A lot of PowerPoints, videos, things like that.

SPEAKER 2: It's like once they've learned it they create a technological project or some kind.

SPEAKER 3: Right, but it's not necessarily used as much, I think. It's probably more like 60/40 or something.

SPEAKER 1: It's not really part of the process of learning.

SPEAKER 3: Not always, but sometimes it is. Or at least in terms of the time, the product will take more in terms of time than actually researching the information.

SPEAKER 4: I see it as kind of an accessibility issue so the kids -- you know back in the day, you know it would be a textbook and a worksheet. And if you didn't have your textbook and you didn't have your worksheet, then you didn't have what you needed. But today you can go on an interactive textbook site. It doesn't matter if you have your book or not, and you can access all the handouts and all the lectures and all the information you need. Even if you don't have whatever physical piece of paper that was passed out. So it allows the kids to stay organized and keep up with what they need even if the middle school backpack is not working out for them, if the papers are not there.

SPEAKER 3: They're all crumpled.

SPEAKER 4: Right.

SPEAKER 2: Yet at the same time, I feel like it's definitely more accessible for many, but it's hard for us to kind of go completely paperless because you can't rely on every student having Internet access at home or knowing how to use it. So I mean it's kind of a double-edged sword there for me. Sometimes I'll want to do something where I'm like, just go home and check the website, or do this activity at home

tonight. And they're like we'll I don't have Internet access, so what do I do for you now?

SPEAKER 4: On NPR this morning they said there are still a 100 million people in the country that don't have Internet access. That's a third of the country.

SPEAKER 2: Wow.

SPEAKER 3: It would be interesting if they did it by age. I mean my parents don't have a computer, don't have Internet, I bet a lot of those are the elderly.

SPEAKER 4: Right.

SPEAKER 1: Oh yeah, my grandma has a hard time working a VCR, you know, so…

SPEAKER 3: My dad goes to the public library if he needs something on the Internet. Or he calls us and asks us, and he types things, like he's got his will and his stuff. So if he needs that revised, then he goes to the public library and does it there.

SPEAKER 1: And I'm sure he thinks that's fairly innovative, like to be able to go somewhere and do that.

SPEAKER 3: He came from corporate America, and they had computers every day. And he did all his work on computers **[unintelligible - 00:06:49].**

SPEAKER 1: They don't own a computer? Wow. So it's more of a tool, just to kind of clarify for that last question. So you see it as more of a tool to demonstrate what they know. It's a medium to help demonstrate what they know versus a tool to help them get to know something.

SPEAKER 3: Yes. And they look at a lot of the [web2S] stuff, it's more presentation stuff like Animoto, Globster, its presentation more so than just traditional stuff for how do you research, but still you have to read.

SPEAKER 1: Whether it's in a book or online, it's still reading.

SPEAKER 2: I mean there's teaching who are using YouTube, so that's more of a learning thing.

SPEAKER 4: In Math I see it kind of the other way, because I use technology during the lessons and during the assignments. But then the learning product, it's still a traditional test. That's just the way I still do it. They might have access to websites or interactive stuff during the couple-week unit, but then at the end, it's a paper and pencil test.

SPEAKER 2: I would say that at least for my class, I think I do a lot of independent research on the Web.

SPEAKER 1: So that's one of the main uses you use technology for, for research?

SPEAKER 2: I think so. We're doing an etiquette thing right now, and they are completely doing it themselves by researching it. I'm not telling like what to do, they just find out stuff about etiquette that they like. I think I try to use it to actually learn.

SPEAKER 1: To use it in a processing and as part of the product.

SPEAKER 3: Yes, but not always.

SPEAKER 1: Okay. What factors do you attribute to your comfort level with using technology in instruction? So, you know, you're either… not very confident, somewhat confident, or very confident with your technology, or with using technology in instruction. So what do you feel like has helped you gain confidence or kept you from being able to build your skills?

SPEAKER 3: Well, it has to be used, right, because now you're an expert on the camera. I mean it has to be the accessibility of the equipment to practice and actually use it with the kids, and that's an issue because we don't -- like, it's limited.

SPEAKER 4: I think that was the main thing with the Smart Board is I'd never used one before. And I, for whatever reason, I was given one and

then you got to decide what you're going to do with it. And so it was trial and error and playing with it, find out new things and talking to people, just figuring it out. You've got to invest the time to do it, and then you've got a room full of kids, and you have to be willing to be up there and make a mistake and try something different.

SPEAKER 3: Like I say, in media, if you get a piece of equipment, what good is it to check it out to a teacher for two weeks? Because they can't learn it in two weeks; they've got to have it all year to get good at it.

SPEAKER 1: So just needing the time. Would you say needing enough time to practice and troubleshoot and figure it out is something that helps build your confidence and when you have that, and something that hinders it is when you don't have that time or the accessibility to it?

SPEAKER 2: I'd have to say that time is the biggest thing.

SPEAKER 4: And like I said before, it's taking a risk in front of the kids. I think some teachers are very nervous about trying something new in front of a group and running into problems, and then the whole thing kind of falls apart. You have to be willing to try, because when you're doing it in your room by yourself is one thing, but doing it in front of on an audience is totally different.

SPEAKER 2: I think it's kind even if you can play with it a little bit on your own. You still aren't going to know all of the issues that you're going run into. Like you said, you know, I think a lot of the time -- we did a project and you were in there, and you were like, did you not convert it the right way? And I was like no. So what are we going to do today? Nothing, I have nothing for them to do.

SPEAKER 1: You have a backup right?

SPEAKER 2: Yeah, having a backup. So I think…

SPEAKER 1: Be able to shoot from the hip if something does go wrong. Or even like having connectivity when you practice it earlier that day, and then you go to actually do it during the lesson, and for whatever reason, wireless isn't working or something like that.

SPEAKER 2: Or we don't have enough computers in the lab, or the laptop cards don't work or something.

SPEAKER 1: Do you feel like there is anything -- like do you feel like any type of schooling that you did or your personal interests or any of those types of things play into why you are either more or less confident with technology? Like possibly, the content that you teach? Do you feel like your mind is in such a way that -- you know, because you've got, like, the artistic brain, and the logical-methodical brain, and you know, the verbal brain. Do you feel like any of those type of factors play into your confidence level, or do you think that you don't really see that playing a part?

SPEAKER 4: In my Math specialist program -- and this was back in '03, so it's been quite a while -- but the whole course, the whole program sequence was this Web-based philosophy, so -- it wasn't online, but it was you go and meet in class. But all the projects and the papers and everything that you turned in would be uploaded to a website. See you create a website which is kind of like a portfolio, and all your stuff gets added to it, and there are different links and stuff. So I learned kind of the ins and outs on how websites are built, and that allowed me to do some projects with the kids that were website-based.

SPEAKER 1: Just through others, all of you experiencing it yourself?

SPEAKER 2: Yeah, I'd say the same thing. 'Cause I, I mean in college everything, I turned in, except for maybe a Math class -- and even that you had

to type stuff out -- so I feel like we did everything where you would turn it in on the computer through email.

So to me, when I came here, I'm like, "Oh my gosh, I have all these papers." And I just want to get to a point where they can just send it to me. That's why I have been looking into Gmail a lot, because I know that you can do a lot with the document thing there. I think it's the same thing when you are taught that way or you do a lot of things on the computer, it seems almost natural to make them do it, too.

SPEAKER 1: I think Julie, I don't know if you've talked to her, but I know she uses GoogleDocs because she sent some stuff to me on GoogleDocs, so she'd be a good resource.

SPEAKER 2: Yeah, I've got it figured out. I'm just now to the point of what to do next. This semester I'm actually starting it and getting the permission from parents to do it, stuff like that, so…

SPEAKER 1: Right. They have to have a Gmail account to be able to do it? Yeah, that would be tough.

SPEAKER 2: They have to be able to sign up for an email address. So we'll see.

SPEAKER 1: Okay. Now here's a question, you teach Math, and a lot of it, I mean the context of Math is kind of problem solving. That's what you're doing every day. Do you feel like that the context of what you teach plays a factor in your ability, I guess, to troubleshoot technology? Do you feel like that skill carries over, like outside of Math to other areas like technology? Or do you feel like you can't make that claim?

SPEAKER 4: Um… not really.

SPEAKER 1: Okay. I'm just looking for ways…

SPEAKER 4: I never, well I never thought about it that way. I guess maybe, but…

SPEAKER 2: But we have math teachers who are not using the AirLiners. They prefer to do the overhead.

SPEAKER 4: We have teachers that are still -- their tests are handwritten. They write it out on a legal pad and they take it to a copy machine. That is still Math. It's still problem solving, so.

SPEAKER 1: And then with media specialists, like -- you came from a Language Arts background, but now media specialist. Would you say your confidence level has certainly increased since this new phase?

SPEAKER 3: In terms of equipment, like the equipment, like cameras and things like that. But as a Language Arts teacher, I think you use all the -- you do research for non-fiction, and you can do blogging. I do blogging for reading responses. I have a website, you know, so all of that. You can do digital links to websites. So I did all that as a Language Arts teacher, so I don't think just because it was Language Arts, it was less technical.

SPEAKER 1: Okay.

SPEAKER 2: I think it has more to do with the mindset of the teacher. I'm teaching Public Speaking and Student Leadership that would not necessarily translate to using a lot of technology. So I feel like it would have to do more with the teacher no matter what. Because I'm a certified Math and Language Arts, and when I was teaching both of those, I used technology.

And so it just came naturally no matter what I teach, I'm going to probably find a way to insert technology, just because I was raised with that and went to school with that, and it's kind of my mindset. So I'm constantly trying to think of how I can go more paperless or how I can do different assignments on the computer.

I think the base thing is the accessibility of not -- even if I want to do a bunch of Web-based research, I can't do that every day. I can't rent out a lab every single day, so I think, even though I do…

SPEAKER 1: But the reason why you try to do those things or incorporate blogs or whatever is because -- and you say it's a mindset, would you all agree with what she was saying about that?

SPEAKER 4: Yeah, I think she's dead on.

SPEAKER 3: I think it has to do with self-learning, you know, and as a teacher, does the teacher take the time to self-learn? In the old days that might have just been reading a book, and then kind of researching your content area. But now it's a lot of technology. You have the time to self-learn, and that's kind of a new thing. It's just a matter of do you have the time and do you have the inclination to…

SPEAKER 1: The will to, or the desire to want to seek out new ideas and learning experiences.

SPEAKER 3: Because it takes more time. I mean if you want to convert your overheads to PowerPoint, it's just going to take some time. Or you can do the easy thing and just keep going with your old stuff, you know? You try and you have one project last year, and it was just a poster. And you want to try [Glocs] or something. It takes time to reinvent the wheel, so.

SPEAKER 4: Yeah.

SPEAKER 1: And when you talk about mindset, do you -- I guess I'm trying to come up with a concrete idea of what you mean when you say mindset. Are you saying tech-minded? Or are you saying a belief, that the mindset is a belief in the value of using technology? How would you all describe that mindset that she's talking about?

SPEAKER 4: I guess it's the openness of trying new ideas.

SPEAKER 1: Openness?

SPEAKER 4: And I don't know if it's necessarily limited to technology. But there's teachers who want to learn new things and want to grow as a teacher and in the profession, and there's others that have been doing

the same lessons every year for X number of years. And they just pull the same notebook off the shelf. So it's an openness to grow. And I think if you're growing, going from a poster to technology, it's just the way the world is these days. That's the direction you're going to go.

SPEAKER 2: I see it a little bit differently, I guess, because I am new the profession. I haven't seen it really change, because this is just what I've come in to. I think for me, kind of my mindset is just I was raised with a lot of technology, and so it kind of comes naturally to me.

You were talking about some teachers would sit down and read a book about their profession. It's like I would never probably do that. You know, I would be the one to more go on the Internet and look up something or… so I feel like it may have to do with how I was raised to use technology even before going to the book. And so that translates into my teaching. I also think that for me, I see so much how students are going to have to use technology in the future. And there's this dualism of they're really great at Facebook and texting, but when you actually ask them to think critically and figure out technology, they're kind of helpless. So I feel like the more that I can expose them to different things, they can learn to figure it out.

SPEAKER 1: Ways to harness that new skill.

SPEAKER 2: So I think that has to do with my mindset. It's kind of like knowing that it's going to be really pertinent for them as they get older, so.

SPEAKER 4: I was actually laughing today because I had a graphing calculator when I was in high school. They've been around forever. And we were doing a graphic calculator thing today, and the kids were still struggling with knowing the keystrokes and having to put the data in, and how to get the graph to pop up. And they thought once the line

finally went through the points, they were all like, "Oh, that's cool!" I was like, "I have been doing that. I mean, it was twenty years ago. We were doing that." I mean, that's not new, you know?

SPEAKER 2: With our etiquette thing that we're doing, I've even given them two different websites that they can look at to find the etiquette information. But I haven't told them, "Okay, you have to find information about these topics." It's like, I just want you to explore. Find out about different types of etiquette, and they would literally go to the home page of EmilyPost.com, and they say, "Where is the information? Where do I go?" I'm like, "You have to look. Explore."

SPEAKER 3: See that's where they're saying, people don't read the Internet, they skim the Internet. And it's really hurting reading comprehension because that whole skimming thing. They cannot sit for any length of time.

SPEAKER 1: They're looking for bold-faced words to pop out at them. I've even seen a lot of kids, when they're doing research, like they type in the question to Answer.com. And I'm like, "That's probably not the best way to find what you're looking for." [Laughter]

SPEAKER 2: I told them, I was like, "You log on to Facebook. Would you just stay at the homepage and expect to find everything?" I was like, "No, you -- In Facebook you're going to go and explore and look at people's pictures and not just expect everything to pop, like -- just what's on your newsfeed is not all that you see on Facebook. You explore it."

SPEAKER 1: Right. And that's the main connection to make with them.

SPEAKER 2: And I was like, "You have to look at things," you know? You read people's notes or you read people's statuses that they update. You

don't expect it all to just pop out at you. It's kind of crazy to me. It's just like, okay, I'm here. Now download it. Where is it?

SPEAKER 1: Just jump off the page at you.

SPEAKER 2: Right.

SPEAKER 3: They say a lot that they don't have the background, because it's a new experience with etiquette. And they don't even know where to begin because they've got no background knowledge.

SPEAKER 2: Right. You're right.

SPEAKER 4: Your comment about reading. I was reading a *TIME* magazine article during SSR. You know, like I try to read so that I can pretend like everyone must be reading. So I had a kid comment the fact that I was actually reading. It was like a four-page article about China and the economy or whatever, and I was actually reading the text, and the kid said, "No one ever reads. You're just supposed to flip through the magazine, like one page every three seconds."

SPEAKER 1: And when they are reading, they're not reading non-fiction text. They're not reading stuff in textbooks, so that's why they have such hard time reading like a Social Studies book or Science book.

SPEAKER 3: The majority, I don't know what it is, like research here – like our non-fiction section does not hardly get used. We'll pull the books, but they don't use them. They pretty much go to the Internet. Which is really not -- I mean, it's okay; that's a good thing. But they're skimming when they're doing research, for sure.

SPEAKER 1: Mm-hmm. Okay. The next question is what anxieties do you face with using technology in instruction? I think one of the ones was already hit on was the fear of it not working when you need it to work, that's fair to say?

SPEAKER 3: I feel like when you are trying out a new technology, it is almost more work. Not only to learn a new technology, but because

generally, you do try to have some sort of backup until you become comfortable with that technology. I think that it's hard sometimes to take that and make a plan B lesson. Yeah, it just not working, that's always frustrating.

SPEAKER 2: I wonder if like, are we just already behind because other schools all have, like -- like I'll go to conferences, and everybody at their school has a whiteboard.

SPEAKER 3: Has a whiteboard?

SPEAKER 4: An interactive whiteboard, a Smart Board.

SPEAKER 1: So what other anxieties, what other fears do you face with using technology in instruction other than it just not working?

SPEAKER 4: I think in the beginning it slows down the process because -- like, the graphing calculators. When you pull out the graphing calculators, you know, there's 20 hands in the air every time you press a button, you know. "I'm stuck, I'm lost," you know, whatever. "The menu's not right." So to get through that, it just takes forever. And so, it's a lot easier to either not do it, or you use graph paper, or just demonstrate it and put it up on the screen but not have the kids do it. You know, I can fly through it in ten minutes. But they wouldn't get the experience, so it's just the beginning of exposing kids to something new just gets so slow.

SPEAKER 2: Yeah, 'cause you're almost having to then teach two lessons. You're not just teaching the math, you're teaching the graphing calculators. I'm not just teaching about etiquette, I'm teaching them how to research, or I'm teaching them how to use PowerPoint or make a website. So for as long as it takes us outside of school time to figure out the technology, you know, it's -- you even have to plan enough time to let them figure out the technology, and usually it's even a little slower for them, so it's…

SPEAKER 1: Like you said they're used to using Facebook. They can probably navigate through Facebook and teach a lesson on how to do that, but using graphic calculator, you know, is a totally different story.

SPEAKER 4: And the thing is, the graphing calculator -- like on Smart View, the calculator is on the Smart Board. I mean the calculator is interactive, so it's a big calculator, and you're actually pressing the buttons like you would on a regular calculator. It's like, "Press this button right here."

SPEAKER 1: Right.

SPEAKER 4: Then 20 hands in the air, "What button did you press?"

SPEAKER 1: Right, right, right. [Laughter] Well the next question is a little different, and again, I want to make sure I clarify the difference. But this question asks what barriers currently exist that keep you from using technology in your instruction.

So it's not fear of not working, but what actual factors are in the way of you doing it? One, it sounds like it's accessibility. Sometimes you don't have access to the things that you need? Is that a fair statement? Okay. What other barriers do you see? And it couldn't be just in your classroom but…

SPEAKER 3: I think training.

SPEAKER 2: And time.

SPEAKER 4: I think time, like you said, has two facets. It's teacher training, and then it's student training.

SPEAKER 3: I mean there's some equipment that you've got to have an expert to show you. Like the AirLiners, you can do basics. But if you wanted to go past it, we've got Student Response, one Student Response. And we've had a couple of teachers trying to use them, but you know, they've only gotten so far, so we've got to have a guy come out and help us with that. So he'll come out for 45 minutes, but then

the teachers are still going to have to put a lot time into becoming experts with it so that they can hopefully train the next set of teachers if we get money to buy some more.

SPEAKER 1: So you mentioned money, so would you say that that's one as well – lack of funding?

SPEAKER 3: Oh, yeah, for sure. I think if we have the money and everybody had a Smart Board, we'd obviously be more advanced in using them. Even if we got the money to use them, it's still going to take teachers over a year to get used to trying to use those. And I actually think Smart Boards, I think the Student Response systems are the way to go, but the majority of the teachers… because that gets all the kids engaged.

SPEAKER 1: Instant feedback, mm-hmm.

SPEAKER 3: Plus they're looking at [me and I'm using with elements for texting.]

SPEAKER 1: Any other barriers that you can think of that keep you from using it, other than the ones that you already named?

SPEAKER 4: I was going to say up to this year, I would have said the county blocks YouTube. There's tons of stuff on YouTube, and now having access to it is a great thing, and I've used videos this year, but up to this year…

SPEAKER 3: And I've used it. I've used YouTube while I was trying to figure out editing software. I was using the tutorials on YouTube to figure out how to do editing.

SPEAKER 1: Which you couldn't have done before.

SPEAKER 3: Exactly.

SPEAKER 4: Or you do it at home, and then you have to convert it to something else, and you bring it into school, and it's just three steps.

SPEAKER 3: And you know they don't pay us, they don't give us the equipment. They want us to do all the stuff here at school, but they don't provide

us -- I mean, you can tote your laptop home every day now, but I still have to pay for my Internet. And 50 percent of the time when I'm on the Internet, it's for school-related stuff, and we get no reimbursement for that. They don't buy us the equipment, that kind of thing. Some teachers are trying to work and do all this stuff with dial-up and, you know, DSL is much more expensive, but you've got to put out of pocket. So it's really nice, and all the training tends to be local school, for the most part, because every school has their own type of equipment that's available.

SPEAKER 4: I would say that it's another -- I don't know if it's a block, but it's a hindrance, because if you're at county training or you're talking to -- you know, I'm one of few 7th accelerated teachers in the county. Each building only has one or two, so you know, you talk to other teachers around the county and you get different ideas. Well, all these schools have all these different things going on, and they're all buying independent technology with local school money. So they might be doing this, but we don't have that, or whatever, whatever the situation is. So it's kind of all over the map. There's not a whole lot of consistency.

SPEAKER 3: Because we've been emailing out about the Student Response systems and the different brands. And the different brand may be three models, and trying to find schools that have different models, who can tell us why that model is the better model. So we're still researching it.

SPEAKER 1: Some schools have, like, a deal with [Promethean] -- was that you who was telling me that? And some have a Smart Board.

SPEAKER 4: Promethean boards, that's another one that people have that don't convert over to **[unintelligible – 00:30:13]**.

SPEAKER 1: Right. So the lack of consistency across the district in terms of, like -- would you say it's fair to say that there is a push to use technology across the district, but in terms of what types of technology or how that is very different?

SPEAKER 3: I think they don't want to dictate that for whatever reason. But on the other hand, it causes us more work, because, you know, whatever we're researching, some other school is researching, and some other school has researched it, you know?

I know they don't want to dictate to us, because you go to the conferences and they have all the different vendors there, and you're allowed to go there and talk to each vendor. But on the other hand, it's like, you know, I'm sure we're all just kind of spinning our wheels doing the same thing, and who knows what we'll come up with at the end, which vendor we go with and whatever. You know, a lot is going to be cost-related, too. Like the Title One schools have tons of money, and they go with the more expensive brands.

SPEAKER 1: Do you feel like that is something that would overall be helpful if the district could, like, almost come together and be more consistent in some of the things that they initiate, or some of the things that they, I guess, encourage in terms of technology?

SPEAKER 4: There's a support issue, too. If we go out and we buy whatever "x" Student Response system that we decide we like the best, the county doesn't necessarily come out and support us on that technology. It only has to be on the list.

SPEAKER 3: It's only if it's on that bid list that they'll support it.

SPEAKER 4: And the other thing…

SPEAKER 3: The other thing is it's not necessarily cheaper when you go through the county, which kind of galls me, even when I order books. I'm like, "Why should I have to go through that vendor?" I can get it on

Amazon $4 cheaper. Why do I have to pay $4 more just because it's the vendor that the county likes? Even the laptops are more expensive and…

SPEAKER 4: And the other side of the coin is that, and I've had other conversations with people, that the county is so heavily invested in IBM that they, where everyone talks that we're all going to get class sets of iPads. I just have a real hard time seeing the county switching over to an Apple model. And there's politics involved, and there's millions and millions of dollars involved.

SPEAKER 3: See and I've heard that the county doesn't like Apple, but like some schools are buying Apple products.

SPEAKER 4: And they're getting zero support.

SPEAKER 3: And they're going to end up being hurt by it.

SPEAKER 4: Exactly.

SPEAKER 3: So we haven't bought anything yet with our technology money, because we're waiting for the retrofit list. If [spots pass] and now it's what in the retrofit, then it may be **[unintelligible – 00:32:48]**.

SPEAKER 4: Kids are coming in with their iPhones, and they're even reading books on their iPhones, and you now, on iPads and all this stuff. And I think that seems to be where the consumer market is headed, at least. But I don't know if the school system can even, you know, have that -- when the contracts are like…

SPEAKER 3: But like, other school districts have iPads.

SPEAKER 4: Yeah, right.

SPEAKER 2: Why is the county against Apple?

SPEAKER 1: It may not be so much that they're against Apple, as they are for IBM in terms of what IBM has been able to work out and negotiate with them. I don't know. But like you said, I think politics are at play, I'm sure.

SPEAKER 4: There's huge contracts involved, massive. Well you know, remember back at the other school, we had Mac labs.

SPEAKER 2: Yeah, I remember Mac labs.

SPEAKER 4: And they all went away, almost overnight. And the PCs all came in. I don't think there's anybody that is thinking that this is going to shift back.

SPEAKER 2: I will say one more barrier is something that kind of – I love the new technology initiative thing that's gonna be, you know… we've heard…

SPEAKER 1: When you say you love it, do you mean you love the idea of it?

SPEAKER 2: The idea of it, yes. You know, of having every student have an iPad and things like that. One thing that I've noticed is, I think we would need more on staff at each school, LSTCs and whatever Dave's official title is.

SPEAKER 3: See, and they're actually decreasing.

SPEAKER 2: Yeah. It's so hard when I'm in the lab and there's not enough computers, so I have to bring in the laptops. And the wireless Internet on four of the laptops go out, and I'm like, okay. I buzz the office, "Can someone find Dave? My students can't move forward with working on this if we can't find someone who can come troubleshoot this." Because that's not even just me learning a website, but I don't know why it doesn't have wireless anymore. So I feel like if every student now has an iPad, either every teacher is going to have to become an expert on an iPad to troubleshoot for students in the middle of class time, or we're going to need a lot more personnel who are in charge of coming in…

SPEAKER 4: And is our wireless network going to support the iPads, which will be no. So then we've got to make sure they're all 3G or whatever and all that, so…

SPEAKER3: Well, I heard that they were looking at a different wireless for the kids. It was in the paper. It was in the paper about SPLOST, and it said that they're looking at putting in new wireless for the kids to bring in their own products.

SPEAKER 2: Yeah, right.

SPEAKER 1: My understanding with a lot of the SPLOST money was going to be for all the technology stuff that they're wanting to – and for the facilities to be able to allow all this new technology to actually be used.

Okay. What do you believe would help you feel more comfortable in using technology in instruction? And it does sound like a couple of things have already been named, just naturally in talking.

SPEAKER 3: Well I think we need to -- because we have been very fortunate, we've won this grant, and it's paid for like two days of summer training in the summer. But if they had money dedicated to where over the summer they could pay for teachers to go through training for an extended period of time, what they make us do is come in early, do 45 minutes before school, give up your planning, and that's not going to be quality. It's got to be outside of instructional times when teachers can really focus on it. And they're going to have to start investing, if they want teachers to become better teachers, they've got to start investing in that and doing more training over the summer. And that means paying the teachers to do that, too.

SPEAKER 2: Because what reality is if you do bring them in before school or during planning, a teacher's constantly thinking, "Oh my gosh, I've got to get these things, I've got to print this stuff for my next class, I have to move my desk around for centers," or whatever.

SPEAKER 4: "I've got three hours of papers to grade. I don't have time for this."

SPEAKER 3: Right, I've got a conference, and I can't – yeah, I mean it's just…

SPEAKER 2: Exactly. It's almost like almost all meetings, no matter what they're for during a school day, I'm almost constantly tapping my fingers thinking I need to be doing something else. Even if it's something that is important that I would like to be paying attention to, it's like I just have a bajillion other things going on in my head.

SPEAKER 1: So in the summer when that's cut -- if it could ever be turned off, it's in the summer, you know? I'm sure we can all agree that it's never really turned off completely, but you certainly can try your best in the summer. So that would be a time where teachers could come in and be focused enough to learn, but it would need to be extensive training, and then be compensated for it.

SPEAKER 2: I've read articles in Japan, and they actually only teach half the day. The other half of the day is a common planning. In America, American teachers teach a larger -- they're on task a larger percentage of the workday than in other countries. So if these other countries, they're given time to meet, to plan, whatever, but we can't do that here during the school day, at least do it during the summer months.

SPEAKER 1: Right.

SPEAKER 2: We've got this huge summer vacation, at least use it wisely. But that means, you know, putting some money up for it, too.

SPEAKER 1: Money into it.

SPEAKER 2: Even if it wasn't during summer, I mean Thanksgiving, Christmas breaks, spring break. If teachers were willing to come in if they were compensated, I would think that if I was going to be here those days, I would come in for training over any of my breaks if I was compensated for it. I would give up…

SPEAKER 1: Certainly, compensation would be an incentive. Okay. What other things might be helpful beyond what you said, the training, things like that? Can you think of anything else?

SPEAKER 2: Well, if a school identified a focus, and the county could assist in pairing kind of a mentor/mentee thing with another school. So if one school gets the funding and it's going to institute a certain type of technology, and the county can pay and help arrange that kind sharing of information just to make it easier. Where you can say this other school has that same type of equipment, share resources, ask people to come over and help train the teachers, show them what they've done with the technology in the class, that kind of thing. That would be really nice.

SPEAKER 1: Almost like a school-to-school mentorship with a focus on technology. That's a good idea.

SPEAKER 4: Another thing we could be using technology for is the idea -- like you were talking about in the Asian countries, they spend half their day either common planning or peer teaching, where they're in each other's classrooms and they're watching the lessons. There would be a group of teachers in the back or who are either watching or assisting the lesson, and so right now we have -- 99 percent of our time we're on our own in our rooms with a group of kids, and there's nobody there, so…

SPEAKER 1: [Other teachers] to go and observe other teachers using the technology?

SPEAKER 4: Well, either use that or what I was thinking was having a way to use technology to either video or to Smart Board, record or do whatever to allow a bank of lessons or some type of access so that the teachers can see other teachers teaching. If we can't do it physically, if we can't be in the room because of the lack of subs or whatever, but we

can watch each other and we can learn from each other. It doesn't even have to be about technology.

SPEAKER 3: The irony is that the state is getting rid of paying people for having a higher degree, you know? Like when I had – did my gifted endorsement, we had to watch videos of teachers teaching lessons. That's the only exposure I've had to that, so the state's not encouraging teachers to go beyond that, so then you're left to gamble it all happening at the local school or at the county level or something.

SPEAKER 4: And there are master teachers in this building who I know are fantastic, who I have never seen teach. So if I can't get into their room, it would be great to see. And it doesn't have to be about technology, it can just be how they manage the class, how they order the steps of the lesson…

SPEAKER 1: So not restricted to technology, but just a chance to see. Mm-hmm, okay. Well, is there just kind of anything -- as we close out, is there anything else you can think of that, you know, we may not have mentioned, that either helps or could hinder something that you feel like if you could come up with an idea to…

SPEAKER 3: Well the technology tab is actually a really cool thing. But it was like, you know, I'm looking at this software, and the first segment was a five-minute video, well it took me an hour to do it because I had to stop the video… yeah, it was something called Net Support where I can spy on all the computers I'm using. But I had to watch the video, I had to stop it, and go back to my software to try to get it fixed up for the media center, so it took me an hour to get through that five-minute video. So I haven't done the next three segments because it just took me forever.

SPEAKER 1: But you think that could be helpful getting into what we need?

SPEAKER 3: But it was very good. It was very good. It has the computer screen, it has the voice **[unintelligible - 00:42:15]** with it, and you can stop and start. It was broken into segments, so you don't have to sit there for five hours. It was very good. If they did more of that, I think it would be more helpful.

SPEAKER 1: Okay, anything else you can think of?

SPEAKER 4: Keep hearing about Elluminate. Sounds like a great thing.

SPEAKER 1: You've got to talk to Michael, have to get him out here.

SPEAKER 4: He's the one that was telling me about it. So I need to investigate how he can come out and pull up…

SPEAKER 1: And with Elluminate, if you've got the webcam over there, that would be an example of a way you could use the video to do what you were just talking about.

SPEAKER 4: Right, so we need to figure that out, other than talking to Michael, I **[unintelligible - 00:42:53]** to think about.

SPEAKER 1: All right.

SPEAKER 2: More personnel.

SPEAKER 1: Just more personnel.

SPEAKER 2: Like you said, pretty soon that they're getting rid people that can be there to help with the technology.

SPEAKER 3: Even there's stuff on the Internet, the Great Lessons, but to find something, it takes hours to find the right lesson.

SPEAKER 4: And then even if you find a good lesson, you still -- at least I still feel the need to personalize it and work your way through it and make it your own and tweak it so that it's kind of your style.

SPEAKER 1: You're speaking almost like a place to go to find a lesson bank, almost? I know you're talking about lessons, lesson bank of ideas that involves technology?

SPEAKER 3: Yeah, I mean there's like all these websites where they've got a PowerPoint already made, and then you can tweak it if you want. But it's like every time you look for something -- I mean I always find there's so many great things on the Internet, but it sure takes a lot of time to find them.

SPEAKER 1: It does, absolutely.

SPEAKER 4: There's a Smart Exchange where there's a Smart Board lesson on everything you can possibly imagine, but most of them come from out of Calgary, Canada, and they're all spelled with Canadian spellings. Like everything is "ou" or whatever. So you have to Americanize it. [Laughter] But the Math is good. [Laughter]

SPEAKER 1: All right, I guess that's it. Thank you so much again./AT