THE RELATIONSHIP BETWEEN SELF-EFFICACY AND TEACHERS’ ABILITY TO INTEGRATE TECHNOLOGY

by

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Of the Requirements for the Degree

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ABSTRACT

This study sought to evaluate the self-efficacy of teachers with regard to the integration of technology within the curriculum. The purpose of this study was to determine if there is a relationship between teachers’ self-efficacy within the classroom and their ability to integrate the technology available in the classroom. A quantitative, correlational study was performed. The sample was a convenience sample of 64 instructors at the middle grade level of a South Georgia school district. Middle school teachers were surveyed at one point in time, using Media and Technology Usage Attitude Scale (MTUAS) and the Teachers’ Sense of Self-Efficacy Scale. Once the data was attained, the data was analyzed using Pearson’s Product Moment Correlation Coefficient. The study determined that there is not a statistically significant relationship between teacher self-efficacy and the ability to integrate technology within the classroom. There was also no significant relationship between teacher self-efficacy and smartphone usage, internet usage, social media usage, text messaging, and email. It was suggested that a study be conducted with a larger sample.

Keywords: technology, self-efficacy, social media, professional develop
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List of Abbreviations

Department of Education and Early Childhood Development (DEECD)

Media Technology Usage Attitude Scale (MTUAS)

Teachers Sense of Efficacy Scale (TSES)

Technology Acceptance Model (TAM)
CHAPTER ONE: INTRODUCTION

Overview

The classroom has changed in many ways over the past twenty years. Technology has become commonplace within the 21st century classroom. These technologies were provided for teachers in an attempt to reach the many different students that could be in the classroom. Unfortunately, many teachers have expressed concern that they do not know how to integrate the technology within the classroom.

Background

A survey by the National Center for Educational Statistics found fewer than half of the 3,000 K-12 teachers that were surveyed reported using technology during instruction (Snyder & Dillow, 2012). If this study is indicative of the general population of educators within the United States, then the use of instructional technology in the classroom is in a precarious situation. Instructional technology includes educational tools that are used to improve the delivery of curriculum standards within the classroom. These technologies include, but are not limited to, computers, cell phones, interactive white boards, and document cameras. These instructional technologies are available in most classrooms, and some are used on a daily basis by students. It should be noted that because of the availability of these technologies, these technologies provide the most familiar format for many students. However, if the findings above are correct, many teachers are not using the best available format to reach students. It suggests that teacher use of technology in education is actually regressing. Today the American public has integrated technology into daily life to a degree that has never been attained in history: “Electronic communications and digital networks are transforming the way we work and are reshaping personal communication and entertainment” (Garrison, Anderson, & Archer, 1999, p. 88).
Despite the growing reliance on technology in public life, teachers in the K-12 arena are failing to integrate technology in a manner that benefits both students and teachers to its fullest potential.

When teachers are using technology, often their use of this tool is not in a manner that was originally intended. For example, interactive whiteboards offer educators many tools to involve the students. However, most teachers use interactive whiteboards as they once used their chalk boards. Many teachers admit that they are not familiar with the best practices with regard to integrating technology in their classrooms. According to a study conducted by Butler and Sellborn (2002), knowing how to use a technology is the second most important factor in determining faculty adoption. This is an important factor with regard to technology integration, however it is not the only factor. Two other factors were also rated as important in terms of adoption: difficulty in using the technology and difficulty in learning to use technology. School systems seek an answer to this issue through the many professional development opportunities afforded educators. Despite the budget that has been devoted to both technology and training, teachers are still concerned about their ability to understand how to use the technology that is being made available to them. Shoepp (2005) introduced a study that sought to define the barriers to technology integration. In this study, he observed, “Faculty or teachers in all of the studies did not feel as they were being provided with enough support to become effective technology integrators” (Shoepp, 2005, p. 16). In fact, another study found that, “… even faculty with high levels of proficiency generally identified the same barriers as faculty with low levels of proficiency” (Butler & Selbourn, 2002, p. 23). The issue remains: how can teachers better equip themselves to be more confident with the integration of technology in the classroom?
Technology affords teachers and students different types of learning opportunities. Nontraditional students have seized the opportunity to return to school. In fact, a study conducted by Allen and Seaman (2010) verified that one of greatest gains in higher education trends over the last decade has been a strong growth in distance education through online coursework. Outside of the education field, many have turned to the availability of information on the internet to learn new skills or crafts. YouTube has become a great source for the do-it-yourselfers, providing short informative how-to videos for a plethora of different situations once reserved for highly trained individuals. Pinterest is yet another social media that has experienced a pronounced growth in the previous two years. In 2011, this social media experienced a 4000% growth (Gilbert, Bakhshi, Chang, & Terveen, 2013). These social media provide individuals with the opportunity to learn specific skills using a brief list of directions or a video. The previous study suggests that perhaps this individualized, constructivist approach may better equip teachers for use of the technology within their classrooms.

While technology enhances the learning environment, the technological advancements of the late twentieth and early twenty-first centuries have created an environment in which technology has become increasingly intertwined with curriculum and pedagogy. Today’s teachers are in the midst of a pedagogical revolution: “Teachers need to be explicitly [taught] how the unique affordances of technology can be used to enrich subject domains for specific learners and … about interactions among pedagogy, content, and technology to develop their technological pedagogical content knowledge” (Clark, 2013, p. 43). Professional development is made available to teachers in an attempt to address these new concerns. Again, some communities have been very successful with regard to professional development, while others have struggled. It is essential that each community succeed in preparing teachers, as educational
reform is continually placing higher demands on the teachers. In a prior study, it was determined that many of the new expectations in education have had a large impact on both teacher and student expectations. “The central elements of systemic reform - high standards, curriculum frameworks, and new approaches to assessment aligned to those standards-generate new expectations for teachers’ classroom behaviors, as well as for student performance” (Garet, Porter, Desimore, Birman, & Yoon, 2001, p. 916). Despite the perceived successes or failures, technology integration is only as successful as the day-to-day use of technology. Many teachers leave professional learning for technology within the classroom feeling empowered to use the technology that they have been trained on, only to become frustrated when confronted with the daunting task of creating interactive, relevant lessons using the technology. It is essential that training be provided for educators that allows them to reach students. In 2012, Cooke concluded, “Education for the contemporary professional no longer ends with diploma, if it ever did. It has been recognized that continuing education strengthens not only knowledge and skills necessary for competent performance but also values and attitudes necessary for the service orientation of a profession” (Cooke, 2012, p.2). Successful professional development should equip the teachers for future success as well as provide tools that will allow them to address future obstacles. It is the belief of the author that a constructivist approach to professional development would best equip learners with the necessary tools to address these future obstacles. This approach would allow the user to construct their own understanding. A person can attain his/her own understanding of the technologies that he/she uses through actually using the technology he/she will gain knowledge and familiarity at the same time.

Constructivism is an approach to learning that is based on the belief that learning is an active process of meaning making gained through a person’s interaction with the world. Previous
studies have found that Constructivism is very conducive with technology integration. “There is a close relationship between technology and constructivism, the implementation of each one benefiting the other” (Gilakjani, Leong, & Ismail, 2013, p. 49). Those who espouse Constructivism believe that learning occurs best when people experience and address conflict. They also believe that an essential component of learning comes from reflection and feedback. A constructivist approach to technology integration requires that the learner be allowed to practice and fail or succeed based on their own experiences. Other approaches do not offer this opportunity to learners. “Constructivist teaching is often contrasted with ‘the lecture approach’ (less charitably referred to as “knowledge dumping”), which involves students “passively receiving content presented in lectures and textbooks” (Wilson, 2012, p. 46). Most professional learning opportunities involve one expert and passive learners. A true constructivist approach to professional development would allow the learner to experiment and learn as he or she goes. However, while this approach makes sense, few professional learning opportunities offer anything similar, as evidenced in the study by Nanjappa and Grant (2003) in which they determined that, “many teachers do not use constructivist practices, and those who do are not judicious in their selection of technology use” (p. 53). One of the barriers may have to deal with the amount of time that it takes to incorporate constructivism. However, despite the amount of time that Constructivism requires, many studies have concluded that education should be remodeled to allow the time for students to invest in their education. “There is a greater sense that, with learner access to the burgeoning resources on the web, and with their increasing digital skills, we should remodel education so that learners can take control of their own learning” (Beetham & Sharpe, 2013, p. xvi). The abundance of sources available to the learner today via
the internet and applications fosters an environment that encourages exploration. This exploration is the foundation of the Constructivist theory.

While there have been various approaches studied with regards to assisting teachers with better understanding technology and its effects, most training is provided in the teacher-training courses at college and teacher education institutions. These trainings usually fail to offer guidance in which there is faculty who are modeling various instructional methods that allows for the integration of the technology (Chuang, Thompson, & Schmidt, 2003; Smith, 2000). Prior studies have shown that one-shot workshops usually fail to provide the modeling and guidance that is needed to effectively integrate technology within the curriculum (Barron, Kemker, Harmes, & Kalaydjian, 2002; Bradshaw, 2002; Mouza, 2002). Teachers need more than an introduction and a few great ideas. Technologies offered today are too complex to incorporate without some advanced training. Other studies have sought to research the effectiveness of pairing teachers with others who have technology backgrounds. These studies provide expert training in the form of a mentor or trainer (Margerum-Leys & Marx, 2002). In some of these studies, graduate students were used to mentor faculty members for a period of one hour a week on the use of technology. Another study used graduate students as mentors while also providing faculty with group training (Leh, 2005). Still other mentoring programs have used undergraduate students as technology mentors. At North Texas, undergraduate students were paired with faculty so that they might mentor them in technology, while learning classroom management and curriculum (Henson, 2001). While these studies did show signs of promise, programs like these are not conducive within the school system. Teachers need a means of training that provides more flexible and convenient opportunities to share ideas and express
concerns regarding technology integration. Despite the type of training offered, many teachers still have difficulty assimilating their new-found tools into their curriculum.

Studies involving staff training for technology have also been performed in the K-12 environment. The University of Maryland performed a study in which teachers experienced in technology mentored other teachers in their school (Davis & Roblyer, 2005). This program did allow more flexibility, but seeking proficient teachers in education could provide some barriers. The university/K-6 partnership pairs technology graduate students with elementary teachers, which would assist with the understanding of what the technology does, but there are issues regarding convenience and communication that would have to be resolved such as: availability of both the teachers and the technology students and how they can communicate when issues occur during the day. In Washington, Generation seeks to train 8th through 12th grade students to mentor teachers in technology use (Chaung, Thompson, & Schmidt, 2003). This use of student mentors assists teachers with regards to better understanding technology, but it could provide for some issues regarding teacher-student relationships, as well as communication issues. Each of these studies, as well as a handful of others, has sought to better equip teachers with the skills necessary to successfully implement technology in the classroom.

There is still one other model which must be considered with regards to training faculty in implementation of technology and collaborative training: the peer mentoring model. Glazer, Hannifan, and Song (2005) suggest,

Teachers often learn technology skills and integration strategies in intensive seminars, ineffective means for professional learning because experiences are seldom transferred to instructional practices. Thus, effective technology integration requires teachers to obtain
learning experiences within the context of their teaching so they can practice, reflect, and modify their practices. (p.57)

Even earlier than Glazer’s study, Windschitl and Sahl (2002) determined that while classroom technology use is affected by teachers’ beliefs on learning, much of the learning takes place in the context of social interactions with their peers. Teachers relate to one another. They speak the same language. They understand one another’s concerns and fears with regards to student issues and technology integration. Teachers would be most suited to communicate the best means of implementing technology. Teachers who teach the same subject better understand the rigors and requirements that peers are required to attain in the classroom. They have a better ability to communicate the relevance or lack thereof with regards to different types of learning activities or technologies.

Another possible means of better equipping teachers to handle the rigors of implementing technology in their classroom has been introduced with the proliferation of social media during the past five years. Web-sites such as You-Tube, Pinterest, and Teacher Tube offer teachers ideas and training for implementing new planning and curricular ideas into their classrooms. These media provide short and concise directions regarding how to better prepare lessons, as well as implement those same lessons. The simplicity associated with many of these sites has offered a new possibility associated with training and curricular planning for teachers.

**Problem Statement**

Schools are faced with federally mandated levels of proficiency that students must attain. Failure to meet these standards could result in minimized funding, as well as the loss of accreditation. In an attempt to attain these heightened standards, educators are constantly seeking new approaches to reach students that are historically low-achieving. For the majority of
teachers, this answer comes in the form of new technology. Using technology makes sense, because today’s students are digital natives (Margaran, Littlejohn, & Vojt, 2011), and the majority of these students are well adept at using technology. However, technology is only as effective as the implementation of said technology. A teacher’s effective use of technology that has been made available to him or her in the classroom has a substantial impact on the effectiveness of the curriculum. Despite their growing dependence on technology, many teachers still report that they lack the necessary confidence to integrate the available technology into their curriculum (Bingimlas, 2009). Schools have responded by providing teachers with additional professional development. However, “any professional development program needs to be multi-faceted in order to meet the needs of the very diverse population,” (Shoep, 2005, p. 19). Previous studies have determined that most teachers felt that the professional development they receive is fragmented and not directly related to the issues that they are facing in the classroom (Liberman & Mace, 2010). In a study conducted in 2006, Zhao and Bryant concluded that while technology integration training can be effective, it is only effective at the most basic levels, and it must be supplemented if higher technology integration is to occur. Therefore, it is imperative for schools to determine an approach that offers teachers more relevant and useful training, so that they might improve their self-efficacy with regard to the technology within their classrooms.

As a general construct, self-efficacy is a perception about one’s abilities within a given domain. “With regard to technology in teaching and learning, multiple domains of self-efficacy beliefs may play a role in a teacher’s thoughts and actions regarding technology in the classroom” (Abbitt, 2011, p. 134). Despite studies regarding technology and teacher self-efficacy, few studies address any relationship between the two variables. In order to better
prepare teachers to successfully integrate technology within the classroom, there needs to be a better understanding of the relationship between self-efficacy and integration of technology in the classroom. The problem is that teachers are struggling to integrate the technology they have available to them within the classroom.

**Purpose Statement**

The purpose of this quantitative correlational study was to determine if there is a relationship between teachers’ self-efficacy within the classroom and their ability to integrate the technology for the purpose of enhancing the curriculum. Two surveys were used in this study. One survey assessed the teachers’ levels of self-efficacy within the classroom and the other survey addressed teachers’ aptitude for using technology within the classroom. Participants in the study included middle grades teachers in a South Georgia school district. For the purposes of this study, a convenience sample was used that comprised 64 middle-school teachers.

The predictor variables were generally defined as teacher self-efficacy and knowledge and consistency of the subject taught. The criterion variable were generally defined as teacher self-efficacy with regard to technology, as evidenced by a survey relating to self-efficacy with regards to the technology available within the classroom. Self-efficacy is the beliefs in one’s own capabilities of succeeding in specific situations (Ashton & Webb, 1986).

**Significance of the Study**

Georgia’s governor, Governor Deal, proposed an education budget that totals 8.49 billion dollars for 2016 (Suggs, 2015). This is a great investment into the futures of the students of Georgia. A portion of this budget is invested in technology for the classrooms. Despite this level of commitment to technology, teachers are not integrating technology to its fullest potential in the classroom. “Even institutions that are eager to adopt new technologies may be critically
constrained by the lack of necessary human resources and the financial wherewithal to realize their ideas” (Johnson, Adams, & Cummings, 2012, p. 9). There have been many studies that have suggested the need for better staff development and training with technology. “If teachers do not have sufficient equipment, time, training, or support, meaningful integration will be difficult, if not impossible, to achieve” (Schoepp, 2005, p. 3). This discovery was further supported by a later study that concluded that there is a link between faculty proficiency, regard for technology, and increasing the likelihood of participating in distance education. This link emphasizes the need for providing faculty with opportunities for training and development (Tabata & Johnson, 2008). Based on the preceding studies, it can be ascertained that success is dependent on all of these elements being met. A training program that provides insufficient access to equipment will be no more successful than a training program that has all of the essential equipment but lacks support. It is imperative that teachers have both access to the equipment, as well as available support for implementing the equipment if technology is to be integrated effectively within the classroom.

Despite the consensus that training is needed, there is little evidence of what is effective. There have been studies that suggest specific approaches, and many studies have suggested further research regarding specific strategies; however, little research has sought to actually quantify what approaches actually influence teacher efficacy. Unless researchers can identify what works, school systems will continue to waste funds in an attempt to fix the problem. “Funding that is inappropriately allocated (e.g., that is used only for hardware purchases and not for personnel or training) is wasted. Such waste contributes to negative attitudes toward technology, which ultimately is represented as the first major barrier to technology adoption” (Rogers, 2000, p. 470). These negative attitudes towards the use of technology within the
classroom make it very difficult for well-intentioned teachers to proactively create lessons that engage the student with relevant technology activities. “In addition to the lack of technology knowledge and skills, some teachers are unfamiliar with the pedagogy of using technology,” (Hew & Brush, 2007, p. 227). However, in today’s society the internet is determined by students as being, “the first realistic means for students to connect with civilization-wide knowledge building and to make their classroom work a part of it” (Scardamaila & Bereiter, 2006, p. 98).

This is evidenced in the students’ reliance on the internet for research assignments, as opposed to traditional means of using media and media center resources.

The goal of this study was to provide evidence for educators as to what the formula may be for success with implementation of technology within the classroom. Teachers are well intentioned, and it is very frustrating to not provide students with what they need. Students’ lives would also benefit greatly from this study, as they might have an opportunity to implement those technologies that they have used for the majority of their lives.

**Research Questions**

The research questions for this study were as follows:

**RQ1:** What is the relationship between teacher self-efficacy and a teacher’s ability to integrate instructional technology available within the classroom?

**RQ2:** What is the relationship between teacher self-efficacy and a teacher’s ability to use smartphones?

**RQ3:** What is the relationship between teacher self-efficacy and a teacher’s ability to use the internet?

**RQ4:** What is the relationship between teacher self-efficacy and a teacher’s ability to use text messaging?
**RQ5:** What is the relationship between teacher self-efficacy and a teacher’s ability to use general social media?

**RQ6:** What is the relationship between teacher self-efficacy and a teacher’s ability to use email?

**Null Hypotheses**

The null hypotheses for this study were:

**H₀₁:** There is no relationship between teachers’ sense of self-efficacy and technology integration within the classroom.

**H₀₂:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use smartphones.

**H₀₃** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use the internet.

**H₀₄:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use text messaging.

**H₀₅:** There is no relationship between a teacher’s sense of self-efficacy and a teacher’s ability to use social media.

**H₀₆:** There is no relationship between a teacher’s sense of self-efficacy and a teacher’s ability to use email.

**Definitions**

1. *Collaborative training* – a system of training in which a group of people learn together as a group (Dias, 1999).
2. *Constructivism* – an approach to learning that is based on the assumption that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences (Schulte, 1996).


4. *Laptop* – a computer that is portable (Bayless, 2013).


8. *Social media* – virtual communities in which people exchange ideas, such as Pinterest and You Tube (Dabbagh & Kitsantas, 2012).


10. *Teacher self-efficacy* – the teacher’s belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context” (Tschannen-Moran, Woolfork, Hoy, & Hoy, 1998).

11. *Technology* – computers, handheld devices, and multimedia equipment such as cameras, video projectors, graphic calculators, and voice recorders (Plair, 2008).
CHAPTER TWO: REVIEW OF THE LITERATURE

Overview

Albert Bandura stated that one of the major ways in which self-efficacy contributes to academic development is through a teacher’s belief in their “personal efficacy to motivate and promote learning” (Bandura, 1993, p. 117). This perceived sense of self-efficacy influences a teacher’s effectiveness in many ways. However, there are few studies that investigate the relationship between this self-efficacy and a teacher’s ability to integrate technology in the classroom. Teachers have so many different instructional technologies available to them, and yet they still have to master their curriculum standards as well. After reviewing studies centered on technology integration and teacher self-efficacy, the literature connecting these two elements is unclear on whether they affect one another. Chapter two is organized as follows (a) types of technology available in the classroom, (b) integration of technology in the classroom, and (c) constructivism.

Types of Technology Available in the Classroom

Interactive whiteboards. As the technology becomes more integral in society, the world continues to shrink as a result. “Students and teachers both are finding it necessary to be technologically adept, to be able to collaborate on a global scale and to understand content and media design” (Johnson, Levine, & Smyth, 2009, p. 10). Interactive whiteboards have become an integral tool in both teachers’ and students’ aspirations to achieve the necessary understandings. Interactive whiteboard technology refers to twenty-first century technology created to replace the traditional white boards of flip charts. The basic functions of these whiteboards include moving, showing, hiding, highlighting, animating, and retrieving objects or
text. These whiteboards allow teachers to present anything that they can save on their desktop to their class as well as record and present or post their materials for review by students.

The number of interactive whiteboards purchased in a year increased from 22,463 in 2001 to 267,136 in 2008 (Levy, 2002). During that same time span, over 757,000 whiteboards were purchased for use in America’s public schools (Alsopp, Colucci, Doone, Perez, Bryant, & Hohlfield, 2012). Whiteboards have become an integral part of most classrooms. “Most IWB (Interactive White Board) studies in school settings highlight the potential of this tool for stimulating interaction among learners” (Schmid & Whyte, 2012, p. 69). Many of those who have integrated the interactive whiteboard into their curriculum have, as a result, shifted form a teacher-centered approach towards a more student-centered approach. In one study with interactive whiteboards it was determined that, as teachers gained more confidence implementing the affordances of the technology, they better understood the potential for broader technology use, in which are part of a seamless learning environment (Schmid & Whyte, 2012, p. 81). However, not all studies support the interactive whiteboard as a great influence on student success. A recent study conducted in Egypt concluded, although early literature is enthusiastic about the potential of interactive whiteboards, and attitudes towards the use of interactive whiteboards have improved, the technology is still not receiving the enthusiasm that was originally thought, based on the data (Albaaly & Higgins, 2012). Therefore, the interactive whiteboard does present some obstacles to the learning environment. Many of these obstacles could be overcome with a firm, productive basis of professional learning.

**Student Response Systems.** Student response systems refer to the technology that allows educators to assess students, by providing immediate feedback. They promise to provide a voice for each child.
Prior research suggests that when combined with effective questioning, discussion, and feedback, classroom network technology constitutes a powerful catalyst for conceptual change, heightened student engagement in class, and because involvement and feedback for all students is equal, greater equity in science instruction. (Penuel, Boscardin, Masyn, & Crawford, 2007, p. 316)

These systems, often referred to as clickers, provide a means for educators to assess student knowledge throughout a lesson. In fact, Kaleta and Joosten (2007) determined, “Faculty enjoy the opportunity to assess student mastery of course content and concepts during class, and students appreciate being able to determine their level of comprehension” (p. 341). Not only does evidence suggest that the student response systems provide an excellent source of assessment, but studies also show that these systems provide an incentive for student participation; “overall, the data showed that both faculty and students liked using clickers and perceived the clickers as having a strong impact upon class engagement and learning. The assessment data showed that clickers had an impact upon student grades” (Kaleta & Joosten, 2007, p. 4). In fact, in the same study, faculty:

- Agreed or strongly agreed that there was greater student engagement (94%).
- Agreed or strongly agreed that there was greater student participation (87%).
- Agreed or strongly agreed that there was greater student interaction (68%).

(Kaleta & Joosten, 2007, p. 5)

One of the keys to successful integration of the student response systems coincides with the teacher’s preparation prior to the actual lesson. A common principle as a result of findings across varying disciplines is that teachers need a broad array of questions mapped to their curriculum to make effective use of response systems (Penuel et al., 2006). Kaleta and Joosten’s
study supported this finding as they found that faculty appreciated that clickers help to identify times when it was necessary to re-teach concepts and material. As one faculty member mentioned, “By getting immediate feedback, I could judge whether students understood the basic concepts. If a vast majority answered the multiple-choice questions correctly, then I could confidently proceed onto the next topic of lecture” (Kaleta & Joosten, 2007, p. 5). Immediate feedback allows teachers to better address those areas in which the students have struggled. This, in return, allows for a better understanding by the students. This is a positive effect that clickers have offered the education field.

The majority of the research on student response systems is positive, although there are some concerns. Heaslip, Donovan, and Cullen (2014) suggested that the student response systems provided some difficulty, as there was a steep learning curve with the technology. The time required to prepare for a lesson was also provided as a means of concern. Kaleta and Joosten (2008) were concerned with “integration of clickers into the design of the class required a greater amount of time than many instructors had anticipated. Also, clicker activities consumed a considerable amount of class time, especially if discussions were linked to questions posed” (Kaleta & Joosten, 2007, p. 8). Other studies reiterate that the use of student response systems alone cannot be looked to as means for improving student learning.

Researchers who have studied student response systems in higher education share a belief that the technology alone cannot bring about improvements to student participation in class and achievement; rather the technology must be used in conjunction with particular kinds of teaching strategies. (Penuel et al., 2006, p. 318)

Based on the research, despite the many perceived advantages allotted through the use of student response systems, there are still some causes for concern.
Type of Technology

**Laptops and tablets.** Laptops have become increasingly popular over the past two decades. In fact, a recent survey indicated that 90 percent of the college students that were polled reported to own a laptop (Baker, 2012). “As educators, we should be modeling technology in the classroom and occasionally have our students use their technology” (Bayless, 2013, p. 132). The availability of technology has provided many opportunities for the classroom teacher that was not available in years past. However, the technology also provides new challenges for the teacher as well. According to a study conducted by Bayless (2013), several law professors have, “banned laptops in the classroom based on three general arguments 1) note-taking is not improved with laptops, 2) students are less engaged in class and less interested in participating when laptops are allowed, and 3) students using laptops and those sitting near them are easily distracted by the laptops (Bayless, 2013, p. 124). Regardless of whether or not the effects are positive or negative, the availability of this technology has definitely changed the landscape of education in a way that is unparalleled in recent history.

One of the areas teachers must address is the effective integration of technology. The widespread use of laptops could lead to potential problems in the classroom if teachers are not properly trained in their use. These problems could affect teacher effectiveness. “Teacher effectiveness contributes to an array of areas that are essential to maintaining a professional environment to facilitate teaching and learning,” (Battle, 2008, p. 105). “There are many influences that affect the effectiveness of a curriculum, one of which is the ability of the educator to effectively use the resources that are made available to him” (Carlson & Reidy, 2004, p. 65). When teachers effectively integrate tablets and laptops into the classroom, the possibilities increase exponentially. “Once seen as an isolating influence, technology is now recognized as a
primary way to stay in touch and take control of one’s own learning” (Johnson et al., 2009, p. 9). In fact, many school systems now view laptops and tablets as an integral piece of the curriculum: “Local, state, and federal funding sources have demonstrated a strong commitment to computer technology use in the classroom by increased investment in hardware and software in schools” (Bayless, 2013, p. 51). Some studies have suggested that these technologies have had a tremendous effect on student learning. Bayless (2013) suggested, “Laptops increased student engagement in wireless classrooms as students participated in more diverse writing activities, analysis of reading, and use of media-production software” (p. 51). Tablets have also received some very favorable reviews in recent studies. Tablets provide the benefits of a laptop in addition to the many apps that are available.

Even without extending their functionality via the full range of mobile apps, tablets serve as nicely sized video players with instant access to an enormous library of content; digital readers for books, magazines, and newspapers; real-time two-way video phones; easily sharable photo viewers and even cameras; fast, easy email and web browsers; and rich, full-featured game platforms — all in a slim, lightweight, portable package that fits in a purse or briefcase — but which significantly omits a traditional keyboard. (Johnson et al., 2012, p. 18)

Laptops and tablets have become so prevalent in today’s society that students have integrated these technologies into their everyday lives. In fact, as people tend to use tablets to supplement and not replace smartphones, they are viewed as less disruptive tools (no phone ringing and no incoming text messages), suggesting they are better compatible for the learning environment (Johnson et al., 2012). With this prevalence and integration of laptops and tablets into the daily lives of students, it would be wise for teacher candidates to be adequately trained for
implementing these technologies within their classroom instruction. However, “Research on learning to teach consistently documents the disjuncture between the practices that beginning teachers encounter in their university teacher preparation courses and those they reencounter in the K-12 classrooms in which they learn to teach” (Anagnostopoulos, Smith, & Basmdjian, 2007, p. 138). Clearly, there is a disparity between what is being taught in the college classroom and what today’s teacher is encountering in the field. Failure to properly prepare pre-service teachers unfairly places even more stress and frustration on the job at hand.

Technology integration is a subject area that many teachers find difficult to transfer from the classroom to actual practice. This is evidenced in the findings of Clark (2013) in which it was concluded that although students’ grades were high, indicating competence in using technologies, students ‘confidence to do initially use the technology was unusually low. Also, when student teaching portfolios were investigated, there was very little evidence of technology integration. The various distractions that technology offers in the classroom often creates a barrier to its integration. It is very difficult to address all of the distractions that these technologies create for the classroom. Some of the barriers that leads to this disconnect between learning and implementing the use of laptops and tablets are associated with the many distractions to the learning environment that these technologies create. According to the study by Bayless (2013), “checking and sending email, checking and posting on Facebook, checking sports scores, shopping, playing games, and reading the news. All of these uses may occur while the instructor is trying to conduct a class at the front of the room” (p. 121). Technology upkeep and repair is another impediment to the successful integration of laptops into the classroom. “In some cases, public schools have invested more time on repairing laptops than on training teachers to teach with them. On the contrary, there is need for schools to invest more on their
faculty rather than on existing computer resources,” (Bayless, 2013, p. 52). Properly working technology is only as effective as the operator.

Mobile devices. Smartphones have become a personal mobile computer, camera, game system, etc. all rolled into one product. “Multi-touch interfaces, GPS capability, and the ability to run third-party applications make today’s mobile device an increasingly flexible tool that is readily adapted to a wide range of tasks for social networking, learning, and productivity” (Windshitl & Sahl, 2002, p. 166). These devices have become an integral piece of daily life. Society depends upon this ever changing technology to supplement their transportation, communication, research, as well as entertainment needs. “The rapid pace of innovation in this arena continues to increase the potential of these little devices, challenging our ideas of how they should be used and presenting additional options with each new generation of mobiles” (Johnson et al., 2009, p. 20).

Educational technology, such as tablets and smartphones offer a great deal of applications that many professors are beginning to leverage as learning tools in the classroom. This allows students to connect the curriculum with real life issues (Johnson et al., 2012). In 2009, 84% of high school students and 60% of middle school students owned a cell phone (Engel & Green, 2011, p. 39). Since nearly all students in higher learning, as well as the majority of students in K-12 education, have these mobile devices, it only makes sense to integrate these readily available forms of technology into the curriculum. While mobile devices have been adopted for general use in society, mobile devices used to support learning in schools is a fairly new concept (Kissko, 2011). However, mobile devices are being utilized within the classroom more and more often. In one study that observed student mobile device use, “There was an observable rise in class participation when cell phones were used in the class. Students felt they were able to make
a contribution to the class using their phones either to comment on the lesson, to answer questions, or to do research to help the lesson continue” (Engel & Green, 2011, p. 44).

One reason often suggested for the increased classroom participation is the familiarity that students have with smart phones. Students depend on these devices on a daily basis; therefore, they know the ins and outs of this technology and make it a point to understand how this technology works because it interests them. Marzano (2003) suggested that when students find activities interesting, they are more likely to participate for longer periods of time. Therefore, the most motivating activities would be projects that students enjoy and find personally meaningful (Marzano, 2003). Integrating smart phones and other mobile devices within the lessons could indeed make the subject matter more meaningful to the students.

**Document cameras.** For many years, teachers relied upon overhead projectors to share graphs and notes with their students. The document camera is seen by many as a new, improved version of that technology. However, the document camera is much more than a projector. Document cameras can be used as overhead projectors. Also, when used in conjunction with specific software, document cameras can be used as a means to grade and record test results. This technology also has the ability to design and create lessons, as evidenced by a previous study in 2013, “Document cameras can record lessons and then play that lesson to help students who were absent and to enable other students get a deeper understanding of the concept” (William, 2011, p. 3).

**Integration of Technology in the Classroom**

**Teachers’ Self Efficacy – Attitude.** Teachers’ attitudes towards technology plays a significant role in the integration of technology. A study conducted by Jhurree (2005) determined that, teachers must have a positive attitude towards computer based learning
environments, because they are at the forefront when it comes to influencing the teaching-learning process inside the classroom. Among the many variables that determine teacher success, teacher self-efficacy has been determined to be one of the most directly related variables. In studies that date back as far as 1986, it was determined that teacher self-efficacy predicts teachers’ teaching philosophy and practice, as well as student achievement (Ashton & Webb, 1986; Midgley, Feldlauffer, & Eccles, 1989; Moore & Essalman, 1992; Ross, 1992). This perceived self-efficacy, along with the stressors that all teachers face, bears a direct impact on what many refer to as teacher burnout. Teacher burnout refers to the emotional exhaustion and fatigue as well as reduced personal accomplishment achieved by many teachers as a result of day-to-day stressors. Stressors include, “behavior issues, parent teacher conflicts, conflict with colleagues, as well as having to organize in new ways as a consequence of working in teams because of school reforms” (Skaalvik & Skaalvik, 2007, p. 613). Teachers with high sense of self-efficacy “create a dynamic, student-centered learning environment in which students take ownership of their learning” (Swan, Wolf, & Cano, 2011, p. 130). This constructivist approach to teaching allows for more involvement by the students. As the students begin to better understand the relevance of their learning, teachers are able to see them achieve more and this achievement breeds confidence within both the students and the teachers.

   Self-efficacy has been referred to as teachers’ beliefs that they can influence students’ behavior and academic achievement. However, teachers’ roles are much more complex with regard to the success of their classrooms. Efficacy is also related to teachers’ ability to maintain classroom discipline, use resources, and support parents in their quest to teach children (Friedman & Kass, 2001). Therefore, a teacher’s self-efficacy is directly related to each of these elements, and if one element is perceived to be weak, by the teachers or their administrators, then
self-efficacy can be adversely affected. This lower self-efficacy can in turn directly impact both teachers’ satisfaction, as well as student achievement (Skaalvik & Skaalvik, 2014). Many times, lower self-efficacy can be attributed to stressors such as: teacher apprehension and lack of motivation, lack of appropriate software and technical support, and lack of training (Jhurree, 2005).

**Factors Affecting Technology Integration.** It is the goal of educators to ensure that all students learn. The Federal Government created a policy that seeks to assist educators with this goal. No Child Left Behind (NCLB) has created a system in which teachers are constantly looking for new ways to reach their children, as their jobs as well as their school’s funding, depends on the success of the students. Failure to meet nationally mandated levels of proficiency can lead to a loss of federal funding, as well as a school’s autonomy. In response to this heightened sense of accountability, teachers are constantly looking for new ways in which they can differentiate their lessons and reach the students that are historically low-achieving. However, integrating technology is a complex process of educational change, and the use of technology in schools is still extremely varied (Tondeur, Kershaw, Vanderlinde, & Brak, 2013). Programs have abounded promising to help teachers differentiate their lessons. Many have turned to technology as a means of providing the differentiation that is needed to reach their students.

Faculty who perceive that using technology has a positive effect on their work are more likely to use it. Moreover, once faculties start to use technology and become more knowledgeable, they tend to use it more often. Furthermore, faculty who become knowledgeable and skillful in using one technology may then be more willing to try a different technology. (Tabata & Johnson, 2008, p. 638)
This approach makes sense because today’s students are digital natives, and many are comfortable using newer technology. However, history has proven that technology is only as successful as its implementation. There are many influences that impact the effectiveness of a curriculum, one of which is the ability of the educator to effectively use the resources that are made available to him/her (Carlson & Reidy, 2004). A teacher’s successful use of technology in the classroom has a substantial impact on the effectiveness of the curriculum.

Despite the growing dependence on technology, many teachers still report that they lack the necessary confidence to integrate technology into their classrooms (Buabeng-Andoh, 2012). Schools have responded to this dilemma by devoting a large portion of their budget to technology. As new technology is introduced, teachers are provided with a brief training. However, as Schoepp suggested that professional development programs need to be multi-faceted in order to meet the needs of every member in the population (Schoepp, 2005). Many teachers do not feel that the training provided is adequate to prepare them to successfully implement technology with their lesson plans. A recent study showed that most teachers perceive professional development to be fragmented and not related to the issues faced in the classroom (Liberman & Mace, 2010). The problem is that although teachers are receiving some professional development, most still feel unprepared to use the technology that is available to them. Teachers’ own learning experiences are affecting the quality of their practices, and the training received in technology does not appear to be adequate, (Tondeur et al., 2013). It is imperative that professional development be redesigned to address these issues.

Studies have determined that teachers’ effective use of technology is directly related to their pedagogical beliefs. For example, Ertmer, Gopalakrishnan, and Ross (2000) state that teachers who are determined to be exemplary in terms of integrating technology use a
constructivist approach to technology use within the classroom. Constructivist approaches to learning with respect to technology include: designing activities around student interests, having students engage in collaborative group projects, focusing on student understanding of complex issues rather than facts, and having the teacher engage in learning with the students as opposed to being the expert. The learning is usually considered to be both student centered and student directed. It requires that teachers give up some of their perceived control of the classroom and often these changes are very difficult for traditional teachers to make and accept. However, teachers who effectively use technology within their classroom have proven to more easily adapt this style of teaching. The assumption is that, “technology use actually prompts teachers to change their practices in the direction of more student-centered approaches” (Ertmer et al., 2000, p. 7). Therefore, better technology integration actually improves a teacher’s direction and focus. Many researchers attribute the poor use of technology and the internet in the classroom to lack of teacher training, lack of knowledge, and poor practices, (Riasati, Allahyar, & Tan, 2012). Therefore, better training or a better supplement to the current training must be established.

Today students across the United States have access to the internet at a ratio of one computer for every four students (ISTE, 2004). Such access would seem to lead to the proliferation of technology integration in the classroom, and as a result improved teaching. However, access does not always lead to improved teaching within the classroom. There are many variables that have been identified as barriers to successful integration of technology within the classroom. Teachers’ use of technology within the classroom can be divided into three different categories: technology for instructional preparation, technology for instructional delivery, and technology as a learning tool. Technology for instructional preparation refers to the way in which a teacher used technology to plan lessons and communicate with peers and
parents. Technology for instructional delivery defines how a teacher and his students use the technology during instruction. Technology as a learning tool describes how the students use various technologies and software to communicate and solve various problems.

Teachers are at the forefront when it comes to influencing the teaching-learning process inside the classroom. It is therefore important to change their attitude towards a computer-based learning environment (Jhurree, 2005). In order for teachers to have a greater sense of self-efficacy with regard to technology, they must be able to confidently navigate all three categories of technology within the classroom. Studies have been conducted in an attempt to determine just what variables have the greatest effect on teacher self-efficacy with regards to technology. In one such study, it was determined that teacher beliefs, teacher computer proficiency, and teacher readiness greatly influenced the successful integration of technology (Inan & Lowther, 2010). Ertmer and Ottenbreit-Leftwich support this finding in their study (2010) but they add that “teachers’ mindsets must change to include the idea that teaching is not effective without the appropriate use of information and communication technologies” (p. 255). All of these elements must be reinforced through training that will allow teachers to develop their own sense of self-efficacy.

Most teacher education programs have established the goal of training the pre-service teacher to be proficient in the use of technology. The majority of teacher preparation programs require an Introduction to Technology course as a prerequisite for entry in the education program. However, this single, separate course is in no way indicative of the familiarity that is needed by teachers with the technology that they have in their classrooms. Several studies have shown that, although a technology-specific course develops basic computer skills, it does not prepare educators to use technology in a variety of instructional settings (Vannatta & Beyerbach,
In fact, many suggest that having a separate course for technology suggests that computers and technology are a non-integral part of instruction (Tutty, Klein, & Sullivan, 2005). Teachers are coming out of school with an inflated sense of self-efficacy towards technology, and this self-efficacy is being dismantled within the first three years of teaching in a classroom (Lee & Lee, 2014). If this is the case, then it is up to the professional development of the school systems to provide the necessary supports for the teachers. Failure to correct this dilemma leads to a lower self-efficacy for teachers, which has been associated with teacher burnout. In a study conducted in 2006, Zhao and Bryant concluded that while technology integration training can be effective, it is only effective at the most basic levels, and it must be supplemented if higher technology integration is to occur. Based on a community of practice approach, collaborative apprenticeships have become an option when addressing the needed technology training. Collaborative apprenticeships are defined as, “a professional development model designed to support teacher learning in their professional teaching community during the school day” (Glazer et al., 2005, p. 59). This model uses interactions between peer teachers and teacher leaders. It has four progressive phases that are intended to move the peer teachers to teacher leaders. In this model, teachers are able to learn from each other and respond to the needs of one another through opportunities that include shared planning. This relationship requires that teachers commit time towards developing a shared set of goals in both instruction and technology integration. These goals can then be communicated and implemented in the shared planning sessions.

Another study (Plair, 2008) suggested mentoring teachers using a knowledge-brokering approach. In this professional development approach, schools train a member of the staff to be a knowledge broker of technology. Essentially, this person would have the sole responsibility of
training others within the building with regards to technology. This specialist would receive training so that they could perform all of the following duties: provide the latest information for teachers on current technologies, prepare and fine tune technology experiences, assist others with assimilating technology within the classroom, provide on-the-spot problem solving, and coordinate learning opportunities for teachers with regards to technology (Plair, 2008). The major weakness this model presents is that the knowledge broker is just one person. It is very difficult for one person to meet the needs of large faculties and staff.

**Technology Integration by Subject.** For some time, the argument has existed that students have different learning styles, and teachers, like their students, have different methods of teaching (Entwhistle, 2013). Some use the lecture method, a demonstration, or discussion method. There are teachers who focus on principles, and others who focus on application of the principles. There are also teachers who emphasize understanding, and others encourage memorization (Felder & Silverman, 1988). Many believe that different teaching styles are more effective in certain content areas. For example, mathematics seeks to use technology by creating a visual representation in place of words and symbols as descriptions (Rubin, 1999). The technology is viewed as offering tools for exploring complexity and is a hands-on approach to learning. Within socials studies classes, many teachers tend to lean towards the lecture or story-telling method. There is a movement towards providing active learning strategies such as role playing and debating to better help students understand the information being taught (McCarthy & Anderson, 2000). This method encourages the student to engage with the material in an interactive role, and thereby spend more time studying the material. Technology is essential for this type of learning to occur, but unlike math, the technology is more for research rather than practical applications. In science, studies suggest that an inquiry approach is best (Friedl &
Koontz, 2004; Mintzes, Wandersee, & Novak, 2005). Again, technology offers many different approaches and interactive sites that allow the student to develop a deeper understanding through activities and experiments. Lastly, English and language arts are subjects that have embraced technology for teaching. There have been studies that have determined that ELA is a subject that can infuse technology in a way that supports pedagogy and involves students in a learning-centered classroom (Pope & Golub, 2000). Still other studies have observed what effects subject matter have on the use of technology. The results reveal that the type of technology used was related to the grade level, the specific subject content, and the school context, such as the availability of whiteboards (Tondeur et al., 2013). It makes sense that availability determines what type of technology is used, but how does the subject taught affect use?

**Professional development.** Faculty must ensure that students not only understand how to use these technologies (those technologies available in the classroom) to their fullest but also recognize the value of technology as a vehicle for enhancing learning” (McCabe & Meuter, 2011, p. 157). In order for teachers to convey this message to students, they must also learn this lesson. An important characteristic of a technologically-progressive educator is a dynamic, constructivist vision of technology integration (Vannatta & Beyerbach, 2000). Teachers must have enough confidence in the technology, as well as the students to allow the students to exert some independence in their studies. However, even among teachers that do feel that they have are proficient in the use of technology, most use technology for preparation and communication, as opposed to delivering instruction or assigning inquiry-based learning activities (Russell & Bradley, 1997). Teachers need to feel the same comfort level when they are planning lessons that incorporate technology as they feel when using technology for communication. User satisfaction, comfort, and perceived usability of technologies are essential to the successful
diffusion of these technologies within the curriculum. Some studies have suggested that professional development that supported collaboration could have enhanced effects on the integration of technology. “Little’s seminal work showed that teachers who planned and worked together over time not only built commitment to each other, but to further learning” (Lieberman & Mace, 2010, p. 1). This collaboration needs to be across the board and encompass both teachers and administrators. “Principals, together with teachers must create ongoing professional development. This will support the technology integration initiatives” (Mancieri, 2008, p. 111).

**Technology training models.** As school systems become more dependent upon technology to communicate and differentiate learning to the student population, there is a growing need to develop training models that effectively assist the teacher with creating and implementing relevant lessons. A previous study looked at programs that incorporate technology students as mentors for education students (Kopcha, 2010). These have their advantages, such as having a mentor with a grasp of the intricacies of today’s technology, however, there are some barriers to their success. Technology majors and education majors may have a difficult time communicating and understanding the goals of one another. Other programs look at the benefits of training a teacher to be an expert in the field of technology and allowing him/her to train and assist the other members of the staff with technology needs. This model requires that one person fill many different roles for many different people.

A few models that do offer some promise for teachers wary of remaining inefficient in technology use involve teacher mentoring and/or collaborative planning. These models seem to offer better communication with regards to vision, support, and mutually benefitting the participants (Tondeur et al., 2013). These two models each seek to integrate strategies such as
faculty modeling and computer skills instruction. These strategies have been successfully used to foster teachers’ attitudes and abilities for technology integration (Koh & Divaharan, 2011).

**Social media and training.** In the twenty-first century, social media sites are a growing influence within our society. Whether it is for entertainment, training, or networking, people today are turning to social media to meet their needs. Studies have shown that college students are integrating social media into their academic experience, both formally and informally (Dabbagh, & Kitsantas, 2012). Integration of social media is not only affecting a specific demographic, it has also increased among students at all age levels. This trend has impacted students and instructors, as well, and “virtually all higher education teaching faculty are aware of the major social media sites; more than three-quarters visited a social media site within the past month for their personal use; and nearly one-half posted content” (Moran, Seaman, & Tinti-Kane, 2011, p. 3). This trend has also impacted instruction. Of the members of faculty that have used social media, a significant portion has used this medium to enhance instruction. Despite some concerns regarding privacy, the majority of faculty believes that the use of social media offers great benefits to teaching.

This trend to turn to social media is not just an educational focus. People of all ages are relying on the internet to meet many of their needs that were traditionally addressed in more interpersonal ways. In fact, dependency on the internet has grown in all age groups. All age groups interviewed (teens, young adults, adults 30-49, adults 50-64, and adults 65 and older) have a significant portion of their demographic using these social media sites (Lenhart, Purcell, Smith, & Zickuhr, 2010). In fact, in each group under the age of 65, over 90 % of those interviewed have experience with social media (Lenhart et al., 2010).
In order for one to benefit from social media in an educational setting, the individual must possess an ability to self-regulate his learning. For example, one must be able to set goals, manage time, and monitor and evaluate progress (Dabbagh & Kisantas, 2011). YouTube is currently the most popular internet video distribution site. Pinterest is also a growing social media site that enables people to pin photos into collections called boards, which serve as large catalogs of objects with the World Wide Web. These sites allow anyone with an internet connection to share ideas and videos with friends, family, and the world for free. Each of these sites is user friendly, and they offer a wide array of instruction. It has been estimated that YouTube offers over 45,000,000 videos, and that number grows at a rate of 7 hours’ worth of videos per hour (Baluja, Sivakumar, Jing, Yagnik, Kumar, & Aly, 2008). The sheer volume of videos available is mind boggling, and these videos offer training in a plethora of different areas. More than 65,000 videos are uploaded daily, while 100,000,000 are downloaded daily (Szabo & Huberman, 2010). Pinterest has not been around as long as YouTube, and as a result, there have been no studies to seek how it has affected the growth of the “do it yourself” revolution, however, there is evidence that this site has created quite a stir. In its short existence, Pinterest has already grown to over 12 million viewers daily (No, 2012).

**Teacher Self-efficacy – Use of Technology.** Levels of self-efficacy are thought to be determined by previous experiences, verbal persuasion, and anxiety levels (Bandura, 1993). It is essentially based on one’s self perceptions, regarding how proficient he/she is with regard to technology. A person’s computer self-efficacy has a distinct impact on whether a person uses computers. This perception will also have an effect on a person’s ability or willingness to attempt to use different technologies associated with computer use. As a result of the necessity for computer self-efficacy in many professional fields, many scales have been created to measure
a person’s self-efficacy with regards to computers. Each of these scales has received criticism for limitations such as: validity in reference to general nature of the questions, the difficulty of understanding the necessary detail associated with the questions, and the difficulty to determine whether the scales were measuring learning self-efficacy or computer self-efficacy (Cassidy & Eachus, 2002).

There is the assumption with regards to technology that usability is a prerequisite of acceptance. Therefore, if a technology is deemed to be usable by teachers, then that technology will be accepted by the people in that field. In attempting to quantify the relationship between the core technological and psychological variables in relation to usage behavior, researchers have developed the Technology Acceptance Model (TAM). The TAM suggests that perceived usefulness and perceived ease of use represent users’ cognitive responses to technology, and these responses then in turn affect the users’ behavioral response towards technology (Holden & Rada, 2011). Griffen (2006) furthered this study by measuring the subjects’ intention to implement technology using a probability dimension between the subjects and integrating technology. This relationship between intention to use and technology use was actually shown to diminish over the course of multiple training sessions, perhaps as a result of the complexity of the software being used (Griffin, 2006). Therefore, if the technology is perceived by the subjects to be too complex, then their interest in using the technology diminishes despite multiple training opportunities. Teachers need to have an opportunity to better understand the technology that they have available to them through relevant activities and opportunities to work out the “kinks” through collaboration.

**Technology in the classroom.** There is no question that technology is becoming more integrated into society. It is difficult to find an activity that has not been affected by today’s
technology. Smart phones provide GPS navigation for travel by car, bike, or foot. There is a common saying among young people, “There is an app for that,” that communicates just how adapted society has become to using technology. There are countless apps and downloads that are available for everything from weight loss to entertainment. Families can access the utilities of their homes from their smart phones while business men and women can have face-to-face meetings via Skype and video conferencing apps. Loved ones can reminisce via social media sites, post pictures and videos, and are able to bridge the gaps created by miles of distance between them. Technology has made the world a smaller place with everything from shopping to learning available at one’s fingertips. One can access the daily news in foreign countries or purchase a priceless work of art in one click. Technology has invaded the majority of Americans’ lives.

The success of technology in every walk of life has afforded the question for academia, “why not in education?” If technology has made other ventures so successful, shouldn’t it do the same for the students who have grown up using it? After all Students who are actively involved in the learning process remember more of what they are learning (Vannatta & Beyerbach, 2000) and technology provides students the opportunity to become more actively involved in their education. Studies have been conducted to seek the benefits of technology integration within the classroom. In short, a large amount of resources has been invested into integrating technology in education, and many research studies have concluded that there are great benefits to be gained by students, teachers, and administrators (Jhurree, 2005).

Technology in education offers many benefits to a community and society including, but not limited to: an enhanced learning environment, a powerful tool to supplement instruction time in the classroom, an administrative tool for teachers, increased access to inclusive education in
the classroom, a communication platform, and a pathway to gaining a competitive edge in today’s global economy (Jhurree, 2005). Any advantage in the learning environment is welcomed in the school of the 21st century.

Educators are looking to technology to enhance learning. “The novelty of the new technologies or learners’ experience of those technologies in the classroom can enhance learners’ engagement and motivation in fulfilling tasks” (see Department of Education and Early Childhood Development (DEECD), 2010, para. 4). Having technology in the classroom offers learners an opportunity to access their own work “in a more meaningful way, become better aware of the quality of their work, and accept feedback more willingly” (Riasati et al., 2012, p. 26). Technology in the classroom can also lower the anxiety for many learners (Riasati et al., 2012).

Technology allows teachers a means of performing the many administrative duties that they have such as: student record keeping, lesson planning, creating assessments, and disseminating data. Microsoft Office offers a variety of programs that seek to make teacher’s lives easier. From spreadsheets to word processing and templates for presenting, the programs available to teachers make what was once a tedious aspect of the job much more manageable.

Aside from administrative duties, technology affords teachers assistance in other areas, as well. Technology offers increased access to education for students with disabilities (Behrmann, 2002). This goal is at the heart of all schools and educational programs. It has been the desire of schools to integrate all students within the classroom, despite the presence of disabilities and technology has made this possible. The use of laptops and tablets are just two technologies that have made integration more attainable in the typical classrooms (Ertmer et al., 2012). The vast majority of schools have computer labs, as well as mobile laptop labs that the teacher can check
out to use in the classroom. Another means of integrating technology in the classroom involves allowing students to bring their own technologies from home. Today, there are also several different types of software that seek to provide assistive technology for students with disabilities.

The internet and email have made it possible to communicate with anyone in the world. Having access to such a great number of people despite distance provides a distinct advantage for today’s teachers and students over previous generations. Today’s teachers and classrooms are able to chat in real time with other classrooms around the world. Parents can be contacted whether they are home or elsewhere.

Lastly, the global economy requires a working knowledge of technology available today for the simplest of employment opportunities. Having access to technology in the classroom offers students a competitive advantage in the workforce. There is no better lesson on how to use technology than to have it available for “hands-on” learning opportunities. Using technology on a day-to-day basis allows students to adopt a self-monitoring role “which leads to a higher chance of fulfilling tasks successfully” (Riasati et al., 2012, p. 26).

**Smartphone use in the classroom.** When polled, 67% of students believed that mobile devices are important to academic success, and they use their devices for academic activities, (Gikas & Grant, 2013). Another study surveyed 975 faculty and students in universities in New York, North Carolina, and Texas, and the results showed that 90% of the respondents owned a lap top and 99% had smartphones, (Cochrane & Bateman, 2010). These studies enforce the general belief that smart phones are a tool, or distraction, that is relevant, and they are not going away. Therefore, it is imperative that teachers determine the best policies to address the best usage of smartphones.
There are many advantages to implementing the use of smartphones in the classroom. For example, Gikas and Grant (2013) determined that smartphones are capable of customizing “the transfer of information in order to build on their skills and knowledge to meet educational goals” (p. 26). These tools can easily improve the transfer of information as it allows the student to control how they interact with the data being presented. Greenhow (2011) summarizes that using social media tools in learning promotes a more student-centered course. Smartphones also have been proven to excel in engaging learners with constant connectivity, fostering collaborative learning, and enabling authentic learning on the move (Gikas & Grant, 2011). The mobility provided by the smartphones provides students with a constant sense of connectivity with the information they need. Students are able to remain connected with classmates and instructors, no matter where they are. Connectivity like this allows better access to the necessary information, which in return, improves student self-efficacy. In addition, mobile technologies “enable learners to find, identify, manipulate and evaluate existing knowledge and successfully integrate and communicate this new knowledge into their work” (Brown, 2005, p. 300).

It is the goal of Constructivism to create a student-centered learning environment. Greenhow (2011) determined that using social media tools, which are available on smartphones, in learning promotes a more student-centered course. The student has more control of the content and communication. Mobile devices allow him the ability to have better access with their peers. These devices offer students the opportunity to collaborate, discuss content with classmates and instructors, and create new meaning and understanding, (Gikas, & Grant, 2013). This enables the learner to create a personalized, authentic learning experience.

While access to information is important, smartphones offer the advantage of mobility. This mobility allows learners to communicate more frequently and in an informal way. Mobility
allows for small group, on-the-go collaboration. The immediate access to each other impacts how students interact (Gikas & Grant, 2011). The students have access to course material regardless of where they are which reinforces learning. Students also have access, wherever they are, to course discussion and required videos.

Smartphones have many benefits in the classroom; however, they also offer some frustrations. These included (a) anti-technology instructors in other classes, (b) device challenges and (c) devices as a distraction (Gikas & Grant, 2011). Despite the advantages associated with technology, many professors ban laptops and smartphones. Their rationale for this include: these devices do not improve note taking, students are less engaged when allowed to use these devices, and students are easily distracted by these devices (Murray, 2011). The distractions have led many teachers to refuse to allow their students access to these devices. Many times when they are allowed to use their own technology, students encounter more obstacles due to device errors and distracts the students from learning.

Despite the challenges, personal technology appears to be here to stay. It would seem that the best way to integrate this technology within education is to devote studies to find ways to incorporate it into teaching, (Bayless, Clipson, & Wilson, 2013). Integrating technology within the lesson may provide more productive ways of using the smartphones, as opposed to providing more distractions.

**Internet searching in education.** The introduction and growth of the internet has had a major impact on the way research is implemented in society. The amount of data available is enormous, and it is growing at a staggering rate. “The volume of data on the internet and the Web has already been overwhelming and is still growing at stunning pace: everyday 2.5 quintillion bytes of data is created and it is estimated that 90% of the data was generated in the
past two years” (Barnaghi, Wang, Henson, & Taylor, 2012, p. 2). This amount of data has had a direct effect on research in the classroom. Teachers and students are using the internet as a primary source for both research and lesson planning because it provides instant access to vast amounts of information.

The access that the internet offers has led to great advantages to teachers and researchers; however, it has also created some new challenges. One of the challenges that educators face as a result of the internet and its many resources is the means by which educators must approach teaching. For many teachers, education is a transformative process; a one-size-fits-all approach. This approach allows the teacher to disseminate information to all learners despite their learning styles. The internet has created a new type of student: digital natives. They are familiar with the use of computers, phones, and other technologies. In fact, in some cases they are more familiar with these technologies than the teachers. This familiarity has transformed the way in which they will learn. The approach that better affects these students tends to be student centered, rather than teacher centered. Today’s students seem to need a more customized approach, rather than the generalized instruction of yesterday. The teacher’s role has moved from that of a transmitter to that of a facilitator, (Thomas, 2011). Therefore, teachers of today’s digital natives may find it best to use a more constructivist approach.

The internet is considered to be one of the most powerful machines that the world has ever known. However; what makes the internet so powerful is not the machinery that incorporates this massive tool, but the “end users who create, share, collaborate and act collectively” (Waks, 2014, p. 216). This tool has revolutionized education, and yet not all of the opportunities that the internet has brought us is beneficial for educators. Laptops in the classroom have been linked to poorer learning outcomes and self-perception of education
(Bayless, Clipson, & Wilson, 2013). Access to so much information and social media offers many challenges for educators and students, as they try to multi-task and focus on both the message from the teacher and the information that they are concentrating on via the internet.

**Text messaging in education.** For many, text messaging offers a convenient and expedient means of communicating with his/her peers. This technology offers a convenience that should be beneficial to the classroom. For many educators, the opposite seems true. Text messaging has gained notoriety as a major distraction in the classroom. In fact, 73.7% of professors polled list students reading text messages in class as the major distraction to the educational environment, while 66.7% percent listed students sending text messages as a major distraction (Bayless et al., 2013). Students are allowing the easy access to their peers to inhibit their ability to focus on the message from the teacher. Another major complaint by educators regarding text messaging is the effect that this technology has had on students’ ability to write. Text messaging allows students to use shorthand and symbols in the communication process, and this type of communication does not transfer to academic writing. This is unfortunate, because text messaging could and should have a place in the classroom.

Although text messaging has received a lot of notoriety for causing distractions to the classroom environment, there is a place in which this technology can add to learning process. Text messaging offers activities that are supplemental and interactive to the traditional methods used by most educators. These activities are capable of improving student engagement. Activities such as polling, posting questions, short-answer writing, and others used to involve each student in the class are activities that use text messaging to involve each student in the class, as opposed to the few who might participate in a typical discussion (Ravizza, Hambrick, & Fenn,
Today, teachers are able to use the technology afforded them through texting to involve many more students in the learning process.

**Social media in the classroom.** Social media use has grown exponentially. One of the many reasons for this growth is that social media provides many to one learning opportunities. This means that thought, actions, and judgments of many can be aggregated, transformed, and represented to a single person (Poor, 2012). An individual can access a variety of videos, opinions, as well as a plethora of other information. This means of communicating has become more acceptable in the education realm over the years. In fact, in a recent study of over 1,000 college and university faculty members throughout the nation, over 80 percent of those polled stated that they use social media in some capacity (Blankenship, 2011). Many of those polled use social media within the classroom, as well as in their personal lives. Thirty percent of faculty used social media to communicate with students, while 52% use social media to do such activities as: share videos, blogs, podcasts, and wikis (Blankenship, 2011).

There is evidence that social media is very beneficial in education. It offers greater student engagement and greater student interest (Blankenship, 2011). Students tend to participate more when they are familiar with the apparatus being used. As evidenced with the statistics, the majority of students are very familiar with social media. Also, social media provides a different platform that is more interactive than the typical blackboard used in classes. Another advantage associated with the use of social media is that it allows the students to take more control of their learning, as well as more responsibility for their education (Blankenship, 2011).

**YouTube and Pinterest as training modules.** The growing fascination of the public with YouTube and Pinterest has led to a growth in the use of instructional videos posted to these
sites. Many people are turning to these sites for educational tutorials in anything from simple home repairs to major renovation projects. Sites such as YouTube are now making new demands on learning, while also providing new supports for learning as well (Duffy, 2008). YouTube is a video sharing website that allows users to upload, view, and share video clips. This site receives over 65,000 uploads, and over 100 million videos are viewed each day (Godwin–Jones, 2007). Since its inception in 2005, it has been constantly growing. If the population is seeking instruction from the likes of YouTube, they must be properly trained in how to use these sites, but more importantly they will receive a benefit that is offered through the availability of videos and instruction in countless different areas. Many of the videos provide easy to follow, step-by-step instructions with video and pictures. However, despite the growing popularity of such videos, the question still remains as to whether or not these web-sites would benefit those in education.

Recently, multiple studies have been performed in an attempt to test the usefulness of these video based web-sites in the realm of education. There was a doubt as to whether students would be able to transfer their technological “real world” skills to a context within academia. However, these websites seem to offer opportunities to create student-centered learning opportunities, which allows them to use their different learning styles to better understand the instruction (Duffy, 2008). This phenomenon allows for differentiation of learning at the instructional level. While these sites are often used in informal academic settings, studies have also suggested that YouTube videos are increasingly being referred to in published academic research (Kousha, Thelwall, & Abdoli, 2012). A study conducted by Jones and Cuthrell (2011) observed the potential uses of YouTube in academic research. These uses were primarily focused on the learner’s interaction with YouTube.
Many professors are now using YouTube as a medium to provide lectures for students who were unable to attend class (Kousha et al., 2012). These videos provide a learning opportunity that is very close to actually being in the class. The YouTube channel of University of California at Berkley has over 3,000 lectures on video. Several subjects have studied the use of YouTube videos in instruction. These subjects include: women’s studies, language learning and teaching, musicology, history, agriculture, engineering, computer science, chemistry, sport sciences, dentistry, and nursing education, (Kousha et al., 2012). The prevalence of use across so many different fields suggests that YouTube offers yet another opportunity for educators to communicate their expertise with their students.

YouTube seems to be changing the ways in which many college lecturers reach their students. It appears that using YouTube offers students a more engaging means of receiving the information from lectures. However, studies have sought to determine what motivates lecturers to use social media as an educational tool, and it is still not clear what drives them to do so. Whatever the reason may be, it is apparent that there is a need for increased awareness of how YouTube and other social networking sites might be applied as academic tools to supplement traditional teaching (Roodt, Villiers, Johnston, Ophoff, & Peier, 2014). YouTube has been proclaimed to be an innovative and cost effective means by which to bridge the communication gap between technology savvy students and their teachers (Abell, 2011). Personal use of the web-site allows the student to have a tool with which they are already familiar with to benefit them in their academic endeavors.

YouTube now has a section that is devoted to academic content. YoutubeEDU features lectures and other materials from colleges and universities. It offers the opportunity for any qualified teacher to contribute. In fact, YouTube has become so successful in its academic
endeavors that other web-sites are also seeking to get involved in the action. One such web site is called Big Think, which offers lectures by award-winning speakers, politicians, and business leaders speaking on a variety of topics (Gilroy, 2009). Other sites include Education for All and Academic Earth. Each of these sites is seeking to provide lectures, as well as other learning resources to students through the medium of an online file sharing service. This service is catching on quickly in colleges across the world, as colleges recognize the potential to use these sites as both marketing and learning tools (Gillroy, 2009). Colleges need to provide online communities where students are, and using online social media and file sharing web-sites acknowledges to students that learning can occur anywhere and at any time. According to the Pew Internet and American Life Project conducted in 2009, 52% of Americans have watched or downloaded online videos, and almost 20% of online viewers watch online videos on a typical day (Little, 2011).

**Constructivism in Education**

Constructivism is a framework of education that suggests that learning is obtained by doing. It states that people make sense out of what they encounter in life. This process became a prominent education philosophy in the early 1990s (Wilson, 2012). The basic concepts of Constructivism include the following concepts:

- Learning is an active process of meaning making gained through our interaction with the world.
- Learning opportunities occur as people experience challenge, conflict, or puzzlement.
- Learning is a social activity involving authentic practices of community.
- Reflection, assessment, and feedback should be embedded within learning activities.
• Learners should take primary responsibility for their learning. (Wilson, 2012, p. 47).

The philosophy of constructivism has greatly influenced learning since its inception, and many feel that this approach is ideal for today’s classroom due to readily available technology. The majority of recent efforts to integrate technology in the classroom have been within the constructivist framework (Gilakjani et al., 2013). The question arises, “why do educators tend to use this approach to integrating technology within their lessons?” The answer appears to be simple enough. Studies have found that the best methods used for integrating technology within the classroom-require the learner to generate parts of the subject matter, and the least effective approaches involve the subject matter being presented to the students (Gilakjani et al., 2013). In the traditional method of instructional design, the learner is not actively involved in the learning process. He essentially receives the information from the instructor. Constructivism requires the learner to participate and technology offered in the classroom provides a greater opportunity for students to participate in their learning.

If Constructivism is more conducive to learning using technology in the classroom, it is probable that it would be more effective at teaching the learner how to use technology as well. In order to learn technology, the learner must actively participate in the process. The computer’s versatility and accessibility has led to “shift the foci from knowledge-as-possession to knowledge-as-construction, and from learning as outside-guided to learning as self-guided” (Tam, 2000, p. 56). Therefore, if people need to construct their own knowledge through the use of technology, then this same approach may have a greater effect on them as they learn how to use technology. While a teacher’s role changes in a constructivist classroom, his expertise is still
needed. Rather than the expert, he now is the guide in the learning process. His role now requires that he provide guidance when needed.

**Summary**

Researchers have concluded that teacher self-efficacy has impacted many different areas of education (Bandura, 1993), and they have also concluded that there are several barriers to technology integration in education (Kopcha, 2012). A gap in the literature was found when no study determined if a relationship existed between teacher self-efficacy and technology integration. A need still existed to fill in the research gaps between teachers’ perceived self-efficacy and technology integration.
CHAPTER THREE: METHODS

Overview

This study sought to determine if there was a significant statistical relationship between teacher self-efficacy and the ability to integrate technology. This quantitative correlational design study was conducted using a sample of certified teachers within a South Georgia district. The teachers were asked to participate in two separate surveys in an attempt to determine if there was any statistically significant relationship between teacher self-efficacy and the ability to integrate technology.

Design

The research design selected for this quantitative study were correlational. Correlational research designs are used to describe the degree of relationship between two or more variables (Creswell, 2008). Pearson correlations were used in this study with teacher self-efficacy as the predictor variable and technology integration as the criterion variable. The sub variables that were studied were: smartphones, internet, text messaging, social media, and emails. The correlational design was appropriate for this study since its purpose is to measure to what degree and direction there are between two or more variables (Gall, Gall, & Borg, 2007). For the purposes of this study, teacher self-efficacy was the predictor variable. The quantitative value of teacher self-efficacy was determined using the Teacher Sense of Self-Efficacy Scale. Teachers’ proficiency with technology was the criterion variable. The corresponding value for teachers’ proficiency with technology integration including smartphones, internet, text messaging, social media, and emails was determined using Media and Technology Usage and Attitudes Scale.
Research Questions

The research questions for this study were as follows:

**RQ1:** What is the relationship between teacher self-efficacy and a teacher’s ability to integrate technology available within the classroom?

**RQ2:** What is the relationship between teacher self-efficacy and a teacher’s ability to use smartphones?

**RQ3:** What is the relationship between teacher self-efficacy and a teacher’s ability to use the internet?

**RQ4:** What is the relationship between teacher self-efficacy and a teacher’s ability to use text messaging?

**RQ5:** What is the relationship between teacher self-efficacy and a teacher’s ability to use general social media?

**RQ6:** What is the relationship between teacher self-efficacy and a teacher’s ability to use email?

Null Hypotheses

The null hypotheses for this study were:

**H₀1:** There is no relationship between teachers’ sense of self-efficacy and technology integration within the classroom.

**H₀2:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use smartphones.

**H₀3:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use the internet.
**H04:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use text messaging.

**H05:** There is no relationship between a teacher’s sense of self-efficacy and a teacher’s ability to use social media.

**H06:** There is no relationship between a teacher’s sense of self-efficacy and a teacher’s ability to use email.

**Participants and Setting**

The participants in this study were drawn from a convenience sample of middle-school educators located in southeast Georgia during the spring semester of the 2015-2016 school year. All middle-school educators were invited to participate. The school district was composed of a student population that is 63% free and reduced lunch. There were four middle schools within the district, which comprises 120 teachers. The total number of surveys delivered to schools was 120. The total number of surveys returned was 66. For the purposes of this study, it should be noted that middle schools consist of grades 6-8. The participating district houses 21 schools, ranging in setting from residential to traditional public high schools. The four middle schools in the system were chosen to participate in the study. The county in which the study took place was home to 80,386 people. The demographics of the county reported as white (69.5%), African American (26.6%), Asian (1.5%), American Indian (.5%), and multi-racial (1.5%) (Williams, 2012). The teachers were asked to self-report their grade taught and ethnic origin for statistical purposes.

The sample was 64, which was 2 short of the minimum required sample size of 66 for a medium effect size at the .05 alpha level with statistical power of .7. The sample was derived from four different middle schools in the southeast Georgia school district. The sample group
was a convenience sample. The sample population was anonymous, so there were no identifying measures to determine race, sex, or years of service.

Within each school the faculty was asked to complete a survey detailing their self-efficacy within their classroom, as well as a survey assessing attitudes towards technology in the classroom. The faculty members were given the opportunity to participate in the study during a faculty meeting after school. Every school within the district was required to hold a school wide faculty meeting once a month. These meetings were held after school and lasted between one and two hours. The faculty were informed of the goals of the study and asked to participate in the study during these faculty meetings. After receiving the information, the faculty had the opportunity to fill out the necessary paperwork and answer both surveys. Each survey took approximately ten minutes to perform.

**Instrumentation**

For the purposes of this study, two surveys, the Teacher Sense of Self-Efficacy Survey and the Media Technology Usage and Attitudes Scale, were completed.

**Teachers’ Sense of Self Efficacy Scale (TSES)**

For several decades, teacher self-efficacy has consistently been related to many instructional variables and student and teacher outcomes (Dufin, Rench, & Patrick, 2012). However, over the years, teacher self-efficacy has been the subject of debate. In particular, there have been concerns over the validity of the scores for teacher self-efficacy (Kopocha & Alger, 2011). There has been debate as to whether teacher self-efficacy is a single construct or comprised of many different factors. The Teachers’ Sense of Efficacy Scale (TSES) has brought some agreement regarding these concerns, and TSES has become the dominant measure for measuring teacher self-efficacy throughout the world (Klassen, Bong, Usher, Chong, Huan,
Wong, & Georgiou, 2010). The survey comprises three distinct factors: efficacy for managing the classroom, efficacy for engaging the students, and efficacy for using different instructional strategies. TSES measures people’s evaluations of their own possible success in teaching. The TSES is a 24-item long survey, grouped into three subscales: efficacy for engagement, efficacy for instructional strategies, and efficacy for classroom management. The rating scale ranges from 1 (nothing) to 9 (a great deal). The TSES scores have been found to be internally consistent in previous studies (Duffin et al., 2012). The TSES is considered to be one of the leading assessments of teacher self-efficacy today.

**Media Technology Usage Attitude Scale (MTUAS)**

Teachers’ attitudes towards technology have a great impact on how technology is being used in the classroom. The Media Technology Usage Attitude Scale (MTUAS) was created to assess the attitudes of teachers towards technology as a general tool in the classroom (McFarlane, Green, & Hoffman, 1997). This survey focuses on numerous technologies that are found to be useful in the classroom. The survey is a 68 item measurement tool that assesses the frequency of 50 items involving technology. The frequencies range from 1 (Never) to 10 (all of the time). Five additional questions refer to the number of friends on Facebook, and they are answered on a 9-point numerical scale that ranges from 0 to 751 or more. Eighteen items assess attitudes towards technology on a five point Likert scale (strongly agree to strongly disagree).

**Procedures**

Prior to initiating the study, the researcher prepared the consent forms (Appendix A), instructing the participants of the intent of the study. The researcher then researched and chose the instruments to be used in the study (Appendices B and C). After determining the appropriate instruments, the researcher sought permission to use the surveys (Appendices D and E).
The researcher initiated the study by obtaining permission from the superintendent of the school district in which the study took place (See Appendix F). This approval was obtained through both email and written permission. Once written approval was obtained, the researcher then contacted the principals of the participating schools. All participating schools taught middle grades (6-8). IRB approval was then obtained (See Appendix G). To ensure the confidentiality of the participants, no identifying information was reported on the survey. The completed surveys were coded by school and a number to identify the participants from each location. No identifying information from the participants was included on the survey. The researcher was the only person with access to both the consent forms and the surveys. At the end of the archival period, three years from the date of the test administration, all surveys and consent forms will be destroyed by the researcher.

Two weeks prior to the designated date for the study, the researcher sent a reminder to the principals of the participating schools. No pilot study was administered, as the validity and reliability of each of the surveys are available.

Prior to administering the survey, via hard copy distribution during staff meeting at each participating school, all certified middle school teachers currently employed in the selected school system received written and verbal explanation of the purpose and the method of the research (See Appendix A). The teachers were informed of the voluntary nature of the study and the right to withdraw from the study at any time, without penalty or loss of benefit. Participants were informed that the results of the study may be published; however, the identifying information would not be included. Those teachers who agreed to volunteer were asked to read the informed consent form (See Appendix A). No signatures were required since the study was anonymous. Once informed consent was reviewed by the participants, the researcher
administered the survey. The subjects were asked to complete both the Teacher Sense of Self-Efficacy Scale and the Media and Technology Attitudes and Usage Scale. The completed surveys were then analyzed and the information disseminated. After the study, the completed surveys were collected and placed in a sealed envelope. After all data was collected, the surveys were stored in a locked file cabinet for no less than three years.

**Analysis**

Pearson correlations were utilized to test the six null hypotheses to describe the strength and direction of the relationship between the two quantitative variables: teacher self-efficacy and technology integration for each domain. The Pearson Product Coefficient measured the relationship between two variables (Laerd, 2013). Data screening was conducted to check for any missing variables. Assumption of Bivariate Outliers were examined using a scatter plot between the predictor variables and criterion variable. Preliminary analysis was run to check for violations of the assumption of linearity and bivariate normal distribution using scatterplots. Due to a Bonferroni correction and the testing of six null hypotheses, the researcher used an alpha level of .008 (two-tailed) (Warner, 2013).
CHAPTER FOUR: FINDINGS

The purpose of this study was to see if there was a correlation between teacher self-efficacy and the integration of technology. The study also sought to see if specific technologies, such as: smartphones, the internet, text messaging, social media, and email had any correlation with teacher self-efficacy. Pearson’s Coefficient was used to determine if the answers submitted on the Teacher Self-Efficacy Survey and the Media Usage and Attitudes Survey had any statistically significant relationship. Each research question will be discussed separately.

Research Questions

The following research questions guided the researcher throughout the study:

RQ1: What is the relationship between teacher self-efficacy and a teacher’s ability to integrate technology available within the classroom?

RQ2: What is the relationship between teacher self-efficacy and a teacher’s ability to use smartphones?

RQ3: What is the relationship between teacher self-efficacy and a teacher’s ability to use the internet?

RQ4: What is the relationship between teacher self-efficacy and a teacher’s ability to use text messaging?

RQ5: What is the relationship between teacher self-efficacy and a teacher’s ability to use general social media?

RQ6: What is the relationship between teacher self-efficacy and a teacher’s ability to use email?

Null Hypotheses

The following Null hypotheses were used as a guide by the researcher throughout the study:
**H₀1:** There is no relationship between teachers’ sense of self-efficacy and technology integration within the classroom.

**H₀2:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use smartphones.

**H₀3:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use the internet.

**H₀4:** There is no relationship between a teacher’s sense of self-efficacy and the teacher’s ability to use text messaging.

**H₀5:** There is no relationship between a teacher’s sense of self-efficacy and a teacher’s ability to use social media.

**H₀6:** There is no relationship between a teacher’s sense of self-efficacy and a teacher’s ability to use email.

**Descriptive Statistics**

The participants in this study consisted of 64 middle school level teachers. These participants varied in race, experience, subjects taught, as well as gender. It was the goal of this study to determine if there were a statistical relationship between the predictor variable and the criterion variables. The sample was anonymous, so there were no identifying measures to determine race, sex, or years of service; therefore, demographic information of the participants was not collected. Mean and standard deviation obtained for the predictor variable (teacher self-efficacy) can be found in Table 1. The 64 participants’ scores ranged between 105 and 215. The average of \((M = 159.57, SD = 2.83)\) suggested that on average teachers have a good sense of self-efficacy within the classroom.
Table 1

*Teacher Self-Efficacy*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher self-efficacy</td>
<td>64</td>
<td>159.57</td>
<td>2.83</td>
</tr>
</tbody>
</table>

The average means and standard deviations for the criterion variables (Teachers ability to integrate technology, ability to use smartphones, ability to use the internet, ability to use text messaging, ability to use general social media, and the ability to use email) can be found in Table 2. These average scores also tallied familiarity with each of the technologies.

Table 2

*Teachers Ability to Integrate Technology: Use Smartphones, Use the Internet, Use Text, Use General Social Media, Use Email*

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to integrate technology</td>
<td>64</td>
<td>174.72</td>
<td>31.82</td>
</tr>
<tr>
<td>Ability to use smartphones</td>
<td>64</td>
<td>48.19</td>
<td>42.03</td>
</tr>
<tr>
<td>Ability to use internet</td>
<td>64</td>
<td>23.83</td>
<td>18.03</td>
</tr>
<tr>
<td>Ability to use text messaging</td>
<td>64</td>
<td>18.14</td>
<td>13.53</td>
</tr>
<tr>
<td>Ability to use social media</td>
<td>64</td>
<td>31.48</td>
<td>36.84</td>
</tr>
<tr>
<td>Ability to use email</td>
<td>64</td>
<td>28.22</td>
<td>13.02</td>
</tr>
</tbody>
</table>

The descriptive statistics were then broken down based on how the subjects answered the Media and Technology Usage and Attitudes Scale (MTUAS) in an attempt to better understand the results of the survey. The descriptive statistics illustrating how each participant voted are available below in Table 3. Fifty-eight percent of the subjects surveyed stated that they use
smartphones several times per week or more, while 39% of those surveyed stated that they use smartphones several times per day or more. Eighty-one percent of the subjects surveyed stated that they use the internet at least several times per week, while 39% stated that they use the internet several times per day or more. Eighty-nine percent of those surveyed stated that they texted at least several times a week. Meanwhile, 95% of the subjects surveyed stated that they use email at least several times a week, and 92% stated that they use email at least once per day. The only variable that subjects did not overwhelmingly report that they had experience with was social media. Sixty-nine percent of the participants in the survey reported that they use social no more than once a week.

Table 3

*Descriptive Statistics*

<table>
<thead>
<tr>
<th>City or Town</th>
<th>Smartphones</th>
<th>Internet</th>
<th>Text</th>
<th>Social Media</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Once a Month</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Sev. Times a Month</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Once a Week</td>
<td>14</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Sev. Times a Week</td>
<td>16</td>
<td>11</td>
<td>20</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Once a Day</td>
<td>12</td>
<td>16</td>
<td>8</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Sev. Times a Day</td>
<td>3</td>
<td>14</td>
<td>19</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Once an Hour</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Sev. Times an Hour</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>All the Time</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62</strong></td>
<td><strong>62</strong></td>
<td><strong>62</strong></td>
<td><strong>62</strong></td>
<td><strong>62</strong></td>
</tr>
</tbody>
</table>
Results

Data Screening

Screening was conducted to check for inconsistencies and outliers among the predictor and criterion variables. One participant completed the surveys, but did not read the questions, assigning answers in a consistent 4, 3, 2, and 1 pattern throughout each survey. The information for the participant was deleted. Scatter plots were used to detect bivariate outliers for the predictor variable and each criterion variable. It was determined that one subject answered one for every question, so this participant’s information was thrown out.

Statistical Analysis

The Pearson correlation is used as a measure of the linear correlation between two variables. Pearson correlations were used to test the six null hypotheses at the .05 alpha level. Scientists have found that .05 offers a good balance between preventing both type 1 and type 2 errors (Laerd, 2013). Due to a Bonferroni correction and the testing of six null hypotheses, the researcher used an alpha level of .008 (two-tailed) (Warner, 2013).

Null Hypothesis One

Assumption tests. Pearson’s $r$ was used to test the null hypothesis one. The assumptions of linearity, bivariate normal distribution, and bivariate outliers were examined using a scatter plot. See Figure 1 for scatter plot. The assumptions were all met.
Null Hypothesis One statistical analysis. Hypothesis one examined if there was a relationship between teacher self-efficacy and the ability to integrate technology within the classroom. A Pearson correlation coefficient was conducted to evaluate the null hypothesis. The researcher did not find a statistically significant relationship between teacher self-efficacy and technology integration within the classroom. See Figure 1 for scatter plot for teacher self-efficacy and media usage. According to Table 4 there have been 64 observations for each of the two variables. The test did not show a statistical correlation due to the fact that $p > .05$. The $p$ value for the first research question was .826 which means there was no statistically significant relationship between teacher self-efficacy and the integration of technology. The r value was .028 which suggested very little strength of the relationship. Therefore, the researcher failed to reject the null $r (62) = .028, p = .826$. The effect size, $r = .028$, was small.

Figure 1. Scatter Plot for Teacher Efficacy and Media Usage
Table 4

*Teachers’ Self-efficacy and Technology Integration*

<table>
<thead>
<tr>
<th>Teacher Self-Efficacy and Technology Integration</th>
<th>Number(N)</th>
<th>Significance (p)</th>
<th>Effect Size (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>.826</td>
<td>.028</td>
<td></td>
</tr>
</tbody>
</table>

**Null Hypothesis Two**

**Assumption Tests.** Pearson’s $r$ was used to test the null hypothesis two. The assumptions of linearity, bivariate normal distribution, and bivariate outliers were examined using a scatter plot. See Figure 2 for scatter plot. The assumptions were all met.

![Figure 2. Scatter Plot for Efficacy and Smartphone Usage](image)

**Null Hypothesis Two statistical analysis.** Hypothesis two examined if there was a relationship between teacher self-efficacy and the ability to use smartphones. A Pearson correlation coefficient was conducted to evaluate the null hypothesis. The researcher did not find a statistically significant relationship between the teacher self-efficacy and the ability to use...
smartphones. The scatter plot in Figure 2 shows no linear relationship between the two variables. The researcher did not find a statistically significant relationship between teacher self-efficacy and the use of smartphones. See Figure 2 for a scatter plot for teacher self-efficacy and the use of smartphones. According to Table 5 there have been 64 observations for each of the two variables. The test did not show a statistical correlation due to the fact that $p > .05$. The $p$ value for the second research question is .962 which means there was no statistically significant relationship between teacher self-efficacy and the use of smartphones. The $r$ value was .006 which suggested very little strength of the relationship. Therefore, the researcher failed to reject the null $r (62) = .006, p = .962$. The effect size, $r = .006$, was small.

Table 5

*Teachers’ Self-efficacy and Use of Smart Phones*

<table>
<thead>
<tr>
<th>Teacher Self-Efficacy and Use of Smart Phones</th>
<th>Number(N)</th>
<th>Significance($p$)</th>
<th>Effect Size ($r$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>64</td>
<td>.962</td>
<td>.006</td>
</tr>
</tbody>
</table>

**Null Hypothesis Three**

**Assumption Tests.** Pearson’s $r$ was used to test the null hypothesis three. The assumptions of linearity, bivariate normal distribution, and bivariate outliers were examined using a scatter plot. See Figure 3 for scatter plot. The assumptions were all met.
Null Hypothesis Three Statistical Analysis. Hypothesis three examined if there was a relationship between teacher self-efficacy and the ability to use the internet. A Pearson correlation coefficient was conducted to evaluate the null hypothesis. The researcher did not find a statistically significant relationship between the teacher self-efficacy and the ability to use the internet. The scatter plot in Figure 3 shows no linear relationship between the two variables. The researcher did not find a statistically significant relationship between teacher self-efficacy and the use of the internet. See Figure 3 for a scatter plot for teacher self-efficacy and the use of the internet. According to Table 6 there have been 64 observations for each of the two variables. The test did not show a statistical correlation due to the fact that $p > .05$. The $p$ value for the third research question is .987 which means there was no statistically significant relationship between teacher self-efficacy and the use of the internet. The $r$ value was .002 which suggested very little strength of the relationship. Therefore, the researcher failed to reject the null $r (62) = .002$, $p = .987$. The effect size, $r = .002$, was small.
Table 6

*Teachers’ Self-efficacy and Use of the Internet*

<table>
<thead>
<tr>
<th></th>
<th>Number(N)</th>
<th>Significance(p)</th>
<th>Effect Size (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Self-Efficacy and Use of the Internet</td>
<td>64</td>
<td>.987</td>
<td>.002</td>
</tr>
</tbody>
</table>

**Null Hypothesis Four**

**Assumption Tests.** Pearson’s $r$ was used to test the null hypothesis four. The assumptions of linearity, bivariate normal distribution, and bivariate outliers were examined using a scatter plot. See Figure 4 for scatter plot. The assumptions were all met.

![Figure 4. Scatter Plot for Efficacy and Text Messaging](image)

**Null Hypothesis Four Statistical Analysis.** Hypothesis four examined if there was a relationship between teacher self-efficacy and the ability to use text messaging. A Pearson correlation coefficient was conducted to evaluate the null hypothesis. The researcher did not find a statistically significant relationship between the teacher self-efficacy and the ability to text.
The scatter plot in Figure 4 shows no linear relationship between the two variables. The researcher did not find a statistically significant relationship between teacher self-efficacy and the use of text. See Figure 4 for a scatter plot for teacher self-efficacy and the use of text messaging. According to Table 7 there have been 64 observations for each of the two variables. The test did not show a statistical correlation due to the fact that $p > .05$. The $p$ value for the fourth research question is .475 which means there was no statistically significant relationship between teacher self-efficacy and the use of text messaging. The $r$ value was .091 which suggested very little strength of the relationship. Therefore, the researcher failed to reject the null hypothesis.

$$r(62) = .091, p = .475.$$ The effect size, $r = .091$, was small.

Table 7

*Teachers’ Self-efficacy and Texting*

<table>
<thead>
<tr>
<th>Teacher Self-Efficacy and Use of text Messaging</th>
<th>Number(N)</th>
<th>Significance ($p$)</th>
<th>Effect Size ($r$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>64</td>
<td>.475</td>
<td>.091</td>
</tr>
</tbody>
</table>

**Null Hypothesis Five**

**Assumption Tests.** Pearson’s $r$ was used to test the null hypothesis five. The assumptions of linearity, bivariate normal distribution, and bivariate outliers were examined using a scatter plot. See Figure 5 for scatter plot. The assumptions were all met.
Null Hypothesis Five statistical analysis. Hypothesis five examined if there was a relationship between teacher self-efficacy and the ability to use social media. A Pearson correlation coefficient was conducted to evaluate the null hypothesis. The researcher did not find a statistically significant relationship between the teacher self-efficacy and the ability to use social media. The scatter plot in Figure 5 shows no linear relationship between the two variables. The researcher did not find a statistically significant relationship between teacher self-efficacy and the use of social media. See Figure 5 for a scatter plot for teacher self-efficacy and the use of social media. According to Table 8 there have been 64 observations for each of the two variables. The test did not show a statistical correlation due to the fact that $p > .05$. The $p$ value for the fourth research question was .987 which means there is no statistically significant relationship between teacher self-efficacy and the use of social media. The $r$ value was .007 which suggested very little strength of the relationship. Therefore, the researcher failed to reject the null $r (62) = .007, p = .987$. The effect size, $r = .007$, was small.
Table 8

*Teachers’ Self-efficacy and Social Media*

<table>
<thead>
<tr>
<th>Teacher Self-Efficacy and Use of Social Media</th>
<th>Number(N)</th>
<th>Significance(p)</th>
<th>Effect Size (r)</th>
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<tbody>
<tr>
<td>64</td>
<td>.987</td>
<td>.007</td>
<td>0.007</td>
</tr>
</tbody>
</table>

**Null Hypothesis Six**

Assumption Tests. Pearson’s $r$ was used to test the null hypothesis six. The assumptions of linearity, bivariate normal distribution, and bivariate outliers were examined using a scatter plot. See Figure 6 for scatter plot. The assumptions were all met.

![Figure 6. Scatter Plot for Efficacy and Email Usage](image)

Null Hypothesis Six statistical analysis. Hypothesis six examined if there was a relationship between teacher self-efficacy and the ability to use email. A Pearson correlation coefficient was conducted to evaluate the null hypothesis. The researcher did not find a statistically significant relationship between the teacher self-efficacy and the ability to use email. The scatter plot in Figure 6 shows no linear relationship between the two variables. The
researcher did not find a statistically significant relationship between teacher self-efficacy and the use of email. See Figure 6 for a scatter plot for teacher self-efficacy and the use of email. According to Table 9 there have been 64 observations for each of the two variables. The test did not show a statistical correlation due to the fact that $p > .05$. The p value for the fourth research question is .925 which means there was no statistically significant relationship between teacher self-efficacy and the use of email. The $r$ value was .012 which suggested very little strength of the relationship. Therefore, the researcher failed to reject the null $r (62) = .012, p = .925$. The effect size, $r = .012$, was small.

Table 9

*Teachers’ Self-efficacy and Email*

<table>
<thead>
<tr>
<th>Teacher Self-Efficacy and Use of Email</th>
<th>Number(N)</th>
<th>Significance($p$)</th>
<th>Effect Size (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Summary**

Sixty-six middle school teachers in a South Georgia region agreed to answer two separate surveys in an effort to attain some statistically valid information regarding whether there was a correlation between teacher self-efficacy and the integration of technology; the sample was 64 after two returned surveys were deemed insufficient. This chapter looked at six research questions and assessed those research questions against the Pearson product correlation coefficient to see if there was a significant relationship between teacher self-efficacy and the integration of technology, as well as the use of smartphones, the internet, text messaging, social media, and email. Each of the six research questions was found to not be significant.
CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Overview

The findings in this study indicated that there was no significant statistically significant relationship between teacher self-efficacy and the criterion variables within the study. Therefore, it was concluded that there is no correlation between teacher self-efficacy and the ability to integrate technology. The specific technologies that were included in the study also showed no statistically significant relationship with teacher self-efficacy. Therefore; it was concluded that teacher self-efficacy had no correlation to the ability to integrate smartphones, the internet, text messaging, social media, and email. However, the findings of the study do offer some insight into how districts can prepare professional learning to better equip teachers to integrate technology.

Discussion

The purpose of this study was to determine if a relationship exists between the predictor variable, teacher self-efficacy, and the criterion variables, the ability to integrate technology, the ability to use smartphones, the ability to use the internet, the ability to use text messaging, the ability to use general social media, and the ability to use email. The study determined that there was not a statistically significant relationship between the predictor and criterion variables for each of the null hypotheses.

This study utilized two surveys, The Teacher Self-Efficacy Scale and Media Usage and Attitudes Scale, to quantitatively examine teachers’ personal beliefs and attitudes towards technology and their own self-efficacy. The data gathering instrument was used to answer the following research questions:
**RQ1:** What is the relationship between teacher self-efficacy and a teacher’s ability to integrate technology available within the classroom?

**RQ2:** What is the relationship between teacher self-efficacy and a teacher’s ability to use smartphones?

**RQ3:** What is the relationship between teacher self-efficacy and a teacher’s ability to use the internet?

**RQ4:** What is the relationship between teacher self-efficacy and a teacher’s ability to use text messaging?

**RQ5:** What is the relationship between teacher self-efficacy and a teacher’s ability to use general social media?

**RQ6:** What is the relationship between teacher self-efficacy and a teacher’s ability to use email?

Pearson correlations were used in this study with teacher self-efficacy as the predictor variable and the following criterion variables: teacher’s ability to integrate technology, teacher’s ability to use smartphones, teacher’s ability to use the internet, teachers’ ability to use text messaging, teacher’s ability to use general social media, and teacher’s ability to use email. This correlational design was appropriate for this study since the purpose of the study was to measure the degree and direction of the relationship between two or more variables (Gall, Gall, & Borg, 2007).

**Null Hypothesis One**

The purpose of the study was to determine if there was a statistically significant relationship between the use of technology within the classroom and teachers’ perceived sense of self-efficacy. Null hypothesis one showed there was no significant relationship between teacher
self-efficacy and the ability to integrate technology. The teachers surveyed scored an average of 174 (Usage) and 53 (Attitudes) out of a possible 350 and 90 on the Media Usage and Attitudes Scale. The high score in the Usage scale was a 211 and the low score was a 105. These scores indicated that even those teachers that use technology regularly do not rely solely on technology as a medium for communicating the lessons in the classroom. There was also a great divide in the amount of dependence on technology within the education community. This relationship is the basis for the present study. The present study found there was no significant relationship between teacher self-efficacy and ability to integrate technology. There was no linear correlation between the two variables. The findings suggested teachers’ success with regards to integrating technology within the classroom was not affected by their perceived confidence in their ability to perform the functions that are essential to teaching. Despite perceived teacher self-efficacy, the majority of teachers scored very high on the Media Usage and Attitudes Survey.

Although this study was the first to determine that there was no relationship between technology integration and teacher self-efficacy, previous studies intimated that this may be the case. In 2012, a study was conducted to determine why many teacher’s pedagogical beliefs did not align with their classroom technology practices. It was concluded that teacher’s own beliefs and attitudes about the relevance of technology to student learning had the greatest impact on their success in implementing technology (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). This study suggested that despite perceived teacher self-efficacy, the majority of teachers are very comfortable using technology.

The findings suggested teachers’ sense of self-efficacy had no effect on their ability to integrate technology within their lives. There was no correlation between teacher self-efficacy and their comfort with using technology, and this lack of a statistically significant relationship
should be considered when seeking to understand how to better acclimate teachers to successfully integrate technology within the classroom. As technology becomes more and more relied upon in education, teachers’ confidence in their abilities to use the technology in a manner that it was intended is essential. The study suggests that teachers’ confidence in their ability to manage their classroom had no linear correlation to their ability to integrate technology. Therefore, administrators may want to start a dialogue with teachers prior to performing professional development classes focused on specific technologies. Rather than focusing on teachers’ attitudes towards technology or their ability to manage their classrooms, the study suggests that the focus of professional development may need to focus on helping teachers better understand how to use the technologies that they are comfortable in their personal life in the classroom. A study performed in 2013 determined that teacher beliefs influenced their technology practices, and that providing proper supports could improve technology integration (Kim, Kim, Chiajung, Spector, & DeMeester, 2013). Teacher’s belief systems are influenced by many factors. While teachers’ sense of self-efficacy does affect their overall performance, there are many other factors that could affect their ability to integrate technology successfully. It is imperative that those tasked with providing professional development opportunities better understand how to assist teachers with applying the skills that they use in their own personal lives with regards to technology. With this knowledge, administrators may seek to provide professional learning opportunities for technology integration that offers focus on applying that knowledge within the curriculum. The study suggested that teachers’ confidence in their own self-efficacy has little or no effect on their ability to integrate technology.

The result of the study regarding teacher self-efficacy and the use of technology suggested that teachers need to receive training that prepares them to be successful with the
intrinsicacies of implementing the technologies that they are already familiar with outside of the classroom. While teacher self-efficacy is very important, it did not relate to successful integration of technology. The data suggested that most teachers, despite what their perceived sense of self-efficacy, were comfortable using technology. The data also showed that some teachers did not use technology regularly despite the fact that they had a very high sense of self-efficacy. Prior to presenting professional development with regards to technology, administrators should seek to better understand what technologies teachers use in their own personal life. Understanding what teachers already know with regards to technology, will allow professional development opportunities to address the real reasons why technology is not being used within the classroom.

**Null Hypothesis Two**

Null hypothesis two found there was not a significant relationship between teacher self-efficacy and teacher’s ability to use smartphones. The teachers surveyed scored an average of 47.73 out of a possible 100 on the Usage Scale. The number indicated that the participants in the study relied on their smartphones several times a week. The high score was a 93, which indicated that the participants depended on their cell phone several times an hour. The lowest score was a 9 which indicated that the participants never used a cell phone. The numbers also indicated that the participants in the study varied a great deal on the amount in which they depended on their smartphones. The study indicated that the use of smart phones was not attributed to teachers’ sense of self-efficacy. Teachers’ self-efficacy did not affect their ability to integrate the use of smartphones within their lives.

The findings with regards to smartphones is significant as school systems continue to attempt to integrate technology into a curriculum that has traditionally centered on textbooks.
Proficiency with the use of smartphones should allow teachers to provide a more student-centered learning center. As indicated earlier, the majority of students own a smartphone. This technology allows the student to access information at any time and any place. Teachers who are proficient with the use of smartphones have access to a tool that allows their students to research topics without having to seek out the assistance of the media center or the use of laptops for everyone. The added convenience gained from using smartphones allows a great deal of flexibility within the curriculum, as opposed to a curriculum based solely on the use of textbooks.

A recent study in 2013 stated that, “teachers are given pencil-and-paper curriculum but asked to also teach with computing devices” (Norris, Soloway, Tan, & Looi, 2013, p. 7). Smartphones are a technology that is available to most students, as well as educators. It has been assumed that a teacher’s self-perceived self-efficacy within his/her craft would influence his/her success in implementing new technologies, such as smartphones. However, as the present study determined, teachers need more than just subject knowledge and an imperative. Smartphones technology affords the luxury of accessing the internet and an array of apps that are beneficial for educational purposes. Given the availability and the ease of access to the internet, it would seem that educators would want to take advantage of the advantages afforded through using smartphones.

The teachers surveyed scored an average of 47.73 out of a possible 100 on the Usage Scale. The number indicates that the participants in the study rely on their smartphones several times a week. The high score was a 93, which indicated that the participant depends on his/her cell phone several times an hour. The lowest score was a 9 which indicated that the participant never uses a cell phone. The numbers also indicate that the participants in the study varied a
great deal on the amount in which they depended on their smartphones. A significant relationship was not found for teacher self-efficacy and the ability to use smartphones. There was no statistically significant relationship between teacher self-efficacy and the integration of smartphones.

The findings in this study suggested that there was no linear correlation between teachers’ perceived self-efficacy and their ability to use smartphones. The accessibility of smartphones would make smartphones an invaluable tool with regards to reaching students with a medium that they feel comfortable using. This evidence was supported by Norris, Hossain, and Soloway (2011) when they determined that, unlike laptop computers, smartphones are a sustainable and cost-effective alternative to using laptops. Therefore, when determining the best means of preparing faculty to successfully integrate the use of smartphones within the classroom, this study suggested that administrators should invest some of that training into better understanding how teachers use smartphones daily, rather than seeking to improve teachers’ sense of self-efficacy. Despite perceived sense of self-efficacy, many teachers are already successfully integrating this technology in their daily lives. Administrators would benefit from assisting teachers in learning how to use those skills that they are already familiar with within the confines of their classroom.

Null Hypothesis Three

Null hypothesis three found there was no significant relationship between teacher self-efficacy and the ability to use the internet. People are required to learn throughout their lives, and it is imperative that they have access to means in which to locate information they need. The internet offers learning environments that are available at all times, and there are no limits to where the internet is available. People are becoming more dependent on the internet. The growth
of mobile devices has led to a massive increase in internet use both inside and outside the
classroom (Saevanee, Clarke, Furnell, & Biscione, 2014).

The Media Usage Scale offered a possible score of 40 for internet usage. The average
score of the participants was a 23.76. The high score(s) were a 40, which indicated that the
participants depended on the internet several times an hour. The lowest score for the study was a
4, which indicated that the participant did not use the internet. Again, there was a great
discrepancy in the amount of time that the participants used the internet. The present study
sought to determine if there was a relationship between teacher self-efficacy and the use of the
internet. A significant relationship was not found for teacher self-efficacy and the ability to use
the internet. Based on the information provided, teachers have varied experiences with the
internet, and these experiences do not correlate to the teachers’ sense of self-efficacy.

The internet can affect teachers’ effectiveness in many areas including the planning and
delivery stages of the lesson. In order for a teacher to effectively communicate the lessons to
students today, they must understand how to use the internet (Scheffler & Logan, 1999). The
present study suggested that teachers’ ability to integrate the use of the internet was not related to
their own perceived sense of self-efficacy. As school administrators seek to enhance teachers’
ability to use the internet, it is imperative that they understand what influences teachers’
integration of technology within the classroom. The present study indicated that teacher self-
efficacy does not have a statistically significant relationship with the ability to use the internet.

Teacher self-efficacy is important for teachers when dealing with many aspects of
teaching. However, teacher self-efficacy does not seem to affect integrating the internet within
the classroom. The foundation of Constructivism is student centered learning. The internet
offers the opportunity for students to control the focus of their learning, thereby making them the
focus of learning. While the internet offers so many opportunities for student centered learning, it also offers many distractions. Teachers’ attitudes towards using the internet, based on these perceived distractions, may be a large influence on their integration of technology. This study would suggest that providing teachers with professional learning opportunities that aid with implementing the skills that they presently use in daily life would benefit teachers. As a result, teachers will receive the training that they need to be more proficient in their craft while better integrating one of the most accessible and available tools they have, the internet.

Null Hypothesis Four

Null hypothesis four found no significant relationship between teacher self-efficacy and the ability to use text messaging. The participants in the present study differed on the use of texting in class, with scores ranging from a 3 to 30. The highest possible score for texting was a 30. The average of the scores for texting was 17.8, which indicates that, on average the participants used text messaging several times per week. The present study sought to determine if there was a relationship between teacher self-efficacy and text messaging. A significant relationship was not found for teacher self-efficacy and the ability to text.

The results of this study suggest that there was no relationship between teachers’ perceived self-efficacy and their ability to use text messaging. Therefore, when determining the best approach to prepare teachers to use text messaging successfully in the classroom, administrators must take a different approach than focusing on skills that affect teacher self-efficacy. If the findings of this study are valid, administrators must seek other elements that may affect the use of text messaging, as teacher self-efficacy has no statistically significant relationship with text messaging.
O’Bannon and Thomas (2014) determined that teachers’ perceptions on mobile phone use, particularly text messaging and apps that use similar formats to texting, varied significantly based on the age of the teacher. Perhaps, the age of teachers does affect their views on the effectiveness of text messaging. Texting is a newer communication phenomenon.

Text messaging is still an essential mode of communication in the 21st century, and the implementation of this widely accepted mode of communication into the curriculum will improve teachers’ ability to communicate and reach the digital natives in the classroom today. The study showed that most teachers do text on a regular basis, as the mean score was a 17.8. This score indicates that the participant communicated via text several times a day.

In order to better develop teachers’ ability to integrate text messaging into the curriculum, administrators have to determine what correlates with successful implementation of this technology. Perhaps the best means of training would be to provide additional informational training for older teachers who are less familiar with the advantages of texting. There are many apps available today that assist the teacher with encouraging students to become more involved in the lessons. Many of these apps center on texting as the predominant means of communication. Administrators may improve the use of this technology in the classroom by just aiding teachers in understanding how essential texting is in communication today. The results of the study showed that many of the teachers were already very familiar with texting. For those teachers that are proficient in using this technology in the classroom, training may need to focus on providing information on the many opportunities that are available to use these skills in the classroom.
Null Hypothesis Five

Null hypothesis five found there was not a significant relationship between teacher self-efficacy and the participants’ use of general social media. Social media use has grown exponentially, and sites such as Facebook and Pinterest are utilized for both personal and professional communications. The participants in the present study scored a 31.53 out of a possible 90 for social media usage. The score would indicate that, on average, participants used social media several times a month. The scores for the participants varied tremendously from a 9 to an 81. The low score of nine indicated that the participants never use social media, while the high score of 81 indicated that the participant used social media several times an hour. The present study sought to determine if there was a relationship between teacher self-efficacy and the use of social media. A significant relationship was not found for teacher self-efficacy and the use of social media.

The present study showed that there is no correlation between teacher self-efficacy and the use of social media. According to a study in 2013, social media for teaching purposes has lagged behind the use of social media for general purposes, but it has increased each year (Seaman & Tinti-Kane, 2013). The present study indicated that the majority of teachers have a working knowledge of social media, as the average teacher scored 31.53. The score indicated that average usage of social media was several times a month for teachers. Understanding that the teacher self-efficacy has no statistically significant relation with the use of technology should provide some guidance for administrators as they seek to better equip teachers to integrate this technology into the classroom.

The integration of social media into the classroom promotes a greater sense of student involvement, as this technology is a means of communication that the vast majority of students
use on a daily basis. A study in 2012 indicated that educators seek to utilize social media as an instructional medium to link informal and formal learning environments (Chen & Bryer, 2012). This reliance on social media indicates the growing need teachers to be equipped to successfully integrate the use of social media within the classroom. Future professional development with regards to social media may need to provide the majority of the teachers that are already using social media in their daily lives with a better knowledge of how social media can assist them in the classroom. It might also benefit administrators to provide a list of social media that is available for teachers.

**Null Hypothesis Six**

Null hypothesis six found there was not a significant relationship between teacher self-efficacy and the participants’ use of email. Email has become a viable means of communicating in both personal and professional realms. The participants in the present study scored an average of 28.42 out of a possible score of 40. The average score indicate that the participants use their email several times a day. The amount of time varied from a low (14) of several times a month to (40) all the time. Despite the discrepancy, all participants used email significantly. The present study sought to determine if there was a relationship between teacher self-efficacy and the ability to use email. A significant relationship was not found for teacher self-efficacy and the use of email. Teacher self-efficacy does not appear to affect the use of email by teachers. The participants in the study all used email a great deal; therefore, they had a knowledge of how to use email. Understanding that teachers’ use email a great deal provides leaders with another means of training teachers to better equip them to integrate their knowledge of email into their lessons, as well as for communication needs with their students.
In education, email has become so accepted that many educators accept assignments through this technology. The data collected from this study suggested that all teachers in the study (n = 64) had a working knowledge of email. This information is important when preparing teachers to learn how to integrate email, because email is so prevalent in the workplace today. In fact, email is used so much that studies have been conducted to determine the proper language to use while emailing professors. For example, Lewin-Jones and Mason (2014) determined that staff often become frustrated and make judgments of students based on their email communication. Future professional learning focused on integrating email into the curriculum may need to focus on the many ways in which email benefits the classroom, as opposed to how to use email.

**Conclusions**

At the start of this study, the researcher sought to understand whether there would be a significant relationship between teacher self-efficacy and the ability to integrate technology. The researcher also sought to understand whether this relationship would be evident in the different technologies that the participants used every day in class such as: smartphones, internet, text messaging, social media, and email. After analyzing the data using a conservative approach in an effort to control the risk of a Type I error, it was determined that there was not a significant relationship between teacher self-efficacy and the ability to integrate technology. It was further discovered that teacher self-efficacy had no significant relationship with the ability to integrate all of the sub-groups: smartphones, internet, social media, texting, and email. While the present study showed there was no correlation between the predictor variable and the criterion variables, this does not mean that the study was not a success.
Whether or not a statistical relationship exists between teacher self-efficacy and the ability to integrate technology in the current study, the research suggested that teachers need support to better integrate the technologies that are available to them. One of the areas in which teachers could benefit with regard to technology integration is in relation to the teachers’ belief systems. Ertmer et al. (2012) suggests that administrators assess teachers’ espoused beliefs and work with them individually to provide resources specific to their belief system. Teachers’ belief systems impact their success or failure with regards to technology integration. The current study suggested that many teachers have integrated the technologies that are available to them in the classroom within their daily life.

Future professional learning opportunities must focus on what teachers believe would help benefit them within the classroom prior to addressing the technological needs. The findings from this study suggested that training for technology related components may not need to focus on how to use the technologies, as many teachers already use these technologies on a daily basis. When focusing on specific technologies, professional learning opportunities, might benefit by focusing more on how the technologies can benefit the classroom. As a result, administrators may need to seek out the different tools that each technology provides that would assist the teacher in communicating the curriculum. During training opportunities, administrators may want to communicate with teachers how the use of the technology assists them with those areas that affect their actual curriculum, as opposed to focusing solely on the technology itself.

Numerous studies have shown positive relationships between teachers’ self-efficacy and various outcomes that are considered to be indicators of teacher performance (Zee & Kooman, 2016). These outcomes vary from teacher well-being to student performance to classroom management. As a result of teacher self-efficacy’s high relevance for teaching and learning,
many international surveys for education, such as the Teaching and Learning International Survey and the Teacher Education and Development in Mathematics Study, have included teacher self-efficacy (Vieluf, Kunter, & Van de Vijver, 2013). As a result, teacher self-efficacy has been determined to have a significant impact on teaching strategies and curriculum implementation. Based on the findings of the current study, a relationship did not exist between teacher self-efficacy and technology integration.

Based on the results of the present study, technology training may be better served to focus on providing information as to how the technologies might impact the classroom, as opposed to teaching basic use of the technologies. This simple addition to professional development would allow teachers to have more confidence in their abilities to integrate these technologies that they already use in their daily lives. As a result, the proper use of technology within the classrooms would increase, and student achievement would increase as well.

Constructivists believe that students learn better when they are given the opportunity to construct their own beliefs based on what they observe. Technology provides teachers and students a great opportunity to explore learning and create their own learning experiences. Previous studies determined that perceived self-efficacy affected fostered constructivist internet-based learning environments (Liang & Tsai, 2008). Therefore, teachers with higher perceived self-efficacy are more confident in fostering a constructivist approach to learning and using technology. The current study suggested that teachers have a working knowledge of the technology that they have available, and they use the technology on a regular basis in their daily lives. Teachers would benefit from training in the ways in which they can take their current knowledge of the technologies and implement these technologies within the classroom to create a more constructivist approach to learning.
Implications

In reference to the technology integration problem that exists in education today, Ertmer et al. (2012) suggested, “It is time for our education workforce to engage in learning the way other professionals do - continually, collaboratively, and on the job - to address common problems and crucial challenges where they work” (p. 12). The present study sought to determine if teacher self-efficacy had a statistically significant relationship with technology integration. If the research determined that there was a statistically significant relationship, then perhaps this would help educators understand how to prepare and equip teachers to better integrate technology in the classroom. Since the present study did not find a statistically significant relationship between teacher self-efficacy and technology integration, the implication did not support previous studies that suggested self-efficacy may be a predictor of behavior and technology integration (Anderson & Maninger, 2007; Anderson, Groulx, & Maninger, 2011; Neiderhauser & Perkmen, 2008; and Teo, 2009).

The present study sought to better define any perceived relationships between teacher self-efficacy and technology integration by seeking whether or not there was a relationship between teacher self-efficacy and specific technologies that teachers have available. All of the technologies that were researched - smartphones, internet usage, text messaging, and email usage - were proven to have a no statistically significant relationship with teacher self-efficacy.

Previous studies suggested that teachers’ views and beliefs significantly impacted their ability to integrate technology (Albion, & Ertmer, 2002; Levin & Wadmany, 2008). It has been determined that while these views affect technology integration, they are a result of numerous non-internal causations. In order for teachers to be better equipped, and thus have a better view of technology, these studies determined that teachers must have diverse teaching experiences so
that they have a wide range of abilities and, as a result, a positive attitude (Levin & Wadmany, 2008). Positive experiences lead to more confidence, which is also associated with a greater success level. The present study determined teacher self-efficacy does not significantly impact teachers’ ability to integrate technology. However, the study also determined that the majority of the teachers did have a working knowledge of the technologies within the classroom, and most of them used these technologies on a regular basis in their daily lives.

The growing integration of technology within society has changed many views on technology a great deal from what they were several years ago. People today rely on computers and smartphones on a daily basis, and the results of the present study confirm this. For example, in each of the subcategories of technology - smartphones, internet, email, text messages, and social media - the average use of the subjects all averaged between several times a week and daily. Despite a person’s competence levels in his/her profession, technology integration has become necessary for daily life.

While teacher self-efficacy did not have a statistically significant relationship with the integration of technology, the study did provide some meaningful information relevant to successful integration of technology. Results of the study indicated that teachers do integrate these technologies within their daily lives on a regular basis. Some of the participants in the study use these technologies several times an hour. Therefore, teachers have a familiarity with these technologies. Perhaps fewer teachers are using these technologies in the classroom, because they do not understand how the technology that they use in their lives outside of the classroom correlates to learning inside the classroom. Based on the findings in the study, it is suggested that professional learning for technology center on how teachers can use their own
working knowledge of these technologies as a means to communicate the curriculum and produce a more constructivist approach.

Technology is essential in today’s classroom. Teachers are given a variety of technologies to use in an attempt to provide multiple mechanisms to reach students and help them to achieve to the best of their ability. However, the technology is only as successful as the teachers’ ability to integrate that technology. The present study suggested that this technology integration may be further enhanced by focusing on the learning to use the teachers’ skills that they already use in their own daily lives in the classroom. Administrators, when planning professional development for technology integration may seek to discover the areas in which their faculty feel as they need the most assistance with regards to using these technologies to provide a more student centered constructivist approach.

**Limitations**

There were several limitations within this study. First the sample and size ($N = 64$) was a limitation. All middle school teachers within a district in southeast Georgia were invited to participate. However, the sample consisted of only public middle school teachers. Elementary, high school, and other types of schools, including private and technical schools, were not invited to participate. Another limitation for the study may have been the time of year in which the study was conducted. The study was conducted at the end of the school year. During this time, teachers were preoccupied with end of the year planning and disseminating test scores. The researcher believes that more teachers would have participated if the study had not been conducted at the end of the year. Lastly, the results of the tools used in the study may have been a limitation. While both the Teacher Sense of Self-Efficacy Scale (TSES) and the Media Usage and Attitudes Scale (MTUAS) were well respected surveys, they better assessed teacher self-
efficacy and media usage among teachers. A survey was not available that would have better assessed teacher technology integration within the classroom.

The TSES was able to assess a teacher’s self-reported sense of self-efficacy. However, the survey relies on teachers to self-assess, and some are more critical in their assessments than others. The MTUAS provided quality information on the usage and attitudes of teachers towards technology. However, the survey did not address the teachers’ views and attitudes towards the technology in the classroom. As a result, it did not provide an accurate picture of how teachers use the technology that they have within the curriculum. A survey that was more education specific would have provided more accurate results.

**Recommendations for Further Research**

While this study concluded that there is no statistical relationship between teacher self-efficacy and the implementation of technology, the study did offer some recommendations for future research. The first recommendation is that a follow-up study be conducted with a larger, more diverse sample. While the results reported provided no significant relationship among the majority of the variables, it would be interesting to see if the results would differ in a larger more diverse population. For future studies, it would be beneficial to create a tool that more accurately assesses teachers’ attitudes and usage of technology within the curriculum. The tool used for this study focused more on everyday use of technology. Teachers’ perceptions differ. It is recommended that a study be conducted with classroom observations for those teachers that rate themselves high with regard to teacher self-efficacy to determine if teachers’ self-perceptions were aligned with the reality of the classroom environment. Another recommendation would be that future research be conducted to compare the integration of technology practices of pre-service teachers with the practices of veteran teachers. This study could determine what type of
professional development would be best to help veteran teachers remain proficient with the technologies that they have in the classroom, especially text messaging. Text messaging seems to be a technology that results differ based on age. Finally, it is suggested that a follow-up study be conducted to determine how the subject being taught affects the teachers’ use of technology within the classroom. It would be interesting to study whether certain subjects are more conducive with using technology than others.
REFERENCES


APPENDICES

Appendix A: Consent Form

THE EFFECTS OF A PROFESSIONAL DEVELOPMENT MODEL THAT INCORPORATES PEER COLLABRATION OF TEACHERS’ SELF EFFICACY WITH REGARDS TO TECHNOLOGY INTEGRATION
Robert Stephen Hickson
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 middle 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 Robert Hickson, School of Education, and Liberty University.

Background Information

The purpose of this study is to determine the correlational relationship between multiple variables (years of service, subject taught, and use of social media) on the self-efficacy of teachers with regards to technology within their classroom. If I can identify a delivery model of professional development that better equips teachers to implement the technology that they have in their classrooms, then teachers may have a better opportunity to provide more relevant lessons using a mode that middle school students are more familiar with.

Procedures

If you choose to participate in this study, you will be asked to complete the following:

- Complete a 26 item Likert-type survey.

Risks and Benefits of participation in the study

The risks of participating in the study are minimal, and they are no more than the participant would encounter in everyday life.
The benefits to participation are that teachers will have an opportunity to optimize their performance in the classroom, through a better and more relevant understanding of the technology that they have access to within the classroom. The information made available within this study may offer local and district officials better plans for professional development that will improve teachers’ confidence with implementing technology within their lessons.

Confidentiality

The records for this study will be kept private. In any sort of report that 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 said records. Only members of the dissertation committee and a Liberty University research consultant will have access if it is requested.

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

The following is a list of people who will have access to the study:

Myself
The Dissertation Committee
Editor
Voluntary Nature of the Study

Participation in this study is voluntary. If you decide to participate, you are able to withdraw from the study at any time.

Contacts and Questions
The researcher conducting this study is Robert Hickson. You are invited to ask any questions you have concerning the study now. If you should have any questions at a later date, you are encouraged to contact me via email at rshickson@liberty.edu or shickson@glynn.k12.ga.us.

You will be given a copy of this agreement to keep for your records.
Appendix B: Teachers’ Sense of Efficacy Scale1 (long form)

Teacher Beliefs How much can you do?

Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.

(1) Nothing
(3) Very Little
(5) Some
(7) Quite a Bit
(9) A Great bit

1. How much can you do to get through to the most difficult students?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

2. How much can you do to help your students think critically?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

3. How much can you do to control disruptive behavior in the classroom?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

4. How much can you do to motivate students who show low interest in school work?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

5. To what extent can you make your expectations clear about student behavior?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

6. How much can you do to get students to believe they can do well in school work?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)
7. How well can you respond to difficult questions from your students?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

8. How well can you establish routines to keep activities running smoothly?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

9. How much can you do to help your students value learning?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

10. How much can you gauge student comprehension of what you have taught?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

11. To what extent can you craft good questions for your students?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

12. How much can you do to foster student creativity?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

13. How much can you do to get children to follow classroom rules?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

14. How much can you do to improve the understanding of a student who is failing?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

15. How much can you do to calm a student who is disruptive or noisy?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

16. How well can you establish a classroom management system with each group of students?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

17. How much can you do to adjust your lessons to the proper level for individual students?  

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)
18. How much can you use a variety of assessment strategies?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

19. How well can you keep a few problem students from ruining an entire lesson?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

20. To what extent can you provide an alternative explanation or example when students are confused?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

21. How well can you respond to defiant students?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

22. How much can you assist families in helping their children do well in school?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

23. How well can you implement alternative strategies in your classroom?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

24. How well can you provide appropriate challenges for very capable students?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)
Teachers’ Sense of Efficacy Scale1 (short form)

Teacher Beliefs How much can you do?

Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.

Nothing

Very Little

Some

Quite a Bit

A Great Deal

1. How much can you do to control disruptive behavior in the classroom?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

2. How much can you do to motivate students who show low interest in school work?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

3. How much can you do to get students to believe they can do well in school work?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

4. How much can you do to help your students value learning?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

5. To what extent can you craft good questions for your students?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

6. How much can you do to get children to follow classroom rules?

(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

7. How much can you do to calm a student who is disruptive or noisy?
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8. How well can you establish a classroom management system with each group of students?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

9. How much can you use a variety of assessment strategies?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

10. To what extent can you provide an alternative explanation or example when students are confused?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

11. How much can you assist families in helping their children do well in school?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)

12. How well can you implement alternative strategies in your classroom?
(1-Nothing) (2) (3-Very Little) (4) (5-Some) (6) (7-Quite a Bit) (8) (9-A Great bit)
Appendix C: Media and Technology Usage and Attitudes Scale (60 items)

Usage Subscales

This scale includes 44 items which comprise 11 subscales: Smartphone Usage (9 items), General Social Media Usage (9 items), Internet Searching (4 items), E-Mailing (4 items), Media Sharing (4 items), Text Messaging (4 items), Video Gaming (3 items), Online Friendships (2 items), Online Friendships (2 items), Facebook Friendships (2 items), Phone Calling (2 items) and TV Viewing (2 items).

10-point frequency scale for items 1–40 (with scoring in parentheses):

- Never (1)
- Once a month (2)
- Several times a month (3)
- Once a week (4)
- Several times a week (5)
- Once a day (6)
- Several times a day (7)
- Once an hour (8)
- Several times an hour (9)
- All the time (10)

Please indicate how often you do each of the following e-mail activities on any device (mobile phone, laptop, desktop, etc.)

1. (E-mailing subscale) Send, receive and read e-mails (not including spam or junk mail).
2. (E-mailing subscale) Check your personal e-mail.
3. (E-mailing subscale) Check your work or school e-mail.
4. (E-mailing subscale) Send or receive files via e-mail.

Please indicate how often you do each of the following activities on your mobile phone.

5. (Text messaging subscale) Send and receive text messages on a mobile phone.
6. (Phone calling subscale) Make and receive mobile phone calls.
7. (Text messaging subscale) Check for text messages on a mobile phone.
8. (Phone calling subscale) Check for voice calls on a mobile phone.

9. (Smartphone usage subscale) Read e-mail on a mobile phone.

10. (Smartphone usage subscale) Get directions or use GPS on a mobile phone.

11. (Smartphone usage subscale) Browse the web on a mobile phone.

12. (Smartphone usage subscale) Listen to music on a mobile phone.

13. (Smartphone usage subscale) Take pictures using a mobile phone.

14. (Smartphone usage subscale) Check the news on a mobile phone.

15. (Smartphone usage subscale) Record video on a mobile phone.

16. (Smartphone usage subscale) Use apps (for any purpose) on a mobile phone.

17. (Smartphone usage subscale) Search for information with a mobile phone.

18. (Text messaging subscale) Use your mobile phone during class or work time.

**How often do you do each of the following activities?**

19. (TV viewing subscale) Watch TV shows, movies, etc. on a TV set.

20. (TV viewing subscale) Watch video clips on a TV set.

21. (Media sharing subscale) Watch TV shows, movies, etc. on a computer.

22. (Media sharing subscale) Watch video clips on a computer.

23. (Media sharing subscale) Download media files from other people on a computer.

24. (Media sharing subscale) Share your own media files on a computer.

25. (Internet searching subscale) Search the Internet for news on any device.

26. (Internet searching subscale) Search the Internet for information on any device.

27. (Internet Searching Subscale) Search the Internet for videos on any device.
28. (Internet searching subscale) Search the Internet for images or photos on any device.

29. (Video gaming subscale) Play games on a computer, video game console or smartphone BY YOURSELF.

30. (Video Gaming Subscale) Play games on a computer, video game console or smartphone WITH OTHER PEOPLE IN THE SAME ROOM.

31. (Video gaming subscale) Play games on a computer, video game console or smartphone WITH OTHER PEOPLE ONLINE.

Do you have a Facebook account? If the answer is “yes,” continue with item 32; if “no”, skip to the Attitudes subscales below. NOTE: The word “social media” may be substituted for Facebook in the question stem above and in items 32–34.

How often do you do each of the following activities on social networking sites such as Facebook?

32. (General social media usage subscale) Check your Facebook page or other social networks.

33. (General social media usage subscale) Check your Facebook page from your smartphone.

34. (General social media usage subscale) Check Facebook at work or school.

35. (General social media usage subscale) Post status updates.

36. (General social media usage subscale) Post photos.

37. (General social media usage subscale) Browse profiles and photos.

38. (General social media usage subscale) Read postings.

39. (General social media usage subscale) Comment on postings, status updates, photos, etc.

40. (General social media usage subscale) Click “Like” to a posting, photo, etc.

Please answer the following questions about your Facebook and other online friends. NOTE: In items 41 and 42 the words “social media” (or any specific social media site) may be substituted for Facebook.
9-point scale for items 37–40 (with scoring in parentheses:

- 0 (1)
- 1–50 (2)
- 51–100 (3)
- 101–175 (4)
- 176–250 (5)
- 251–375 (6)
- 376–500 (7)
- 501–750 (8)
- 751 or more (9)

41. Facebook friendships subscale) How many friends do you have on Facebook?

42. (Facebook friendships subscale) How many of your Facebook friends do you know in person?

43. (Online friendships subscale) How many people have you met online that you have never met in person?

44. (Online friendships subscale) How many people do you regularly interact with online that you have never met in person?

*Attitudes Subscales*

These subscales include 16 items, which comprise four subscales: Positive Attitudes Toward Technology (6 items), Anxiety About Being Without Technology or Dependence on Technology (3 items), Negative Attitudes Toward Technology (3 items) and Preference for Task Switching (4 items)

5-point Likert scale for all items (with scoring in parentheses)

- Strongly agree (5)
- Agree (4)
- Neither agree nor disagree (3)
- Disagree (2)
- Strongly disagree (1)

1. (Positive attitudes) I feel it is important to be able to find any information whenever I want online.
2. (Positive attitudes) I feel it is important to be able to access the Internet any time I want.
3. (Positive attitudes) I think it is important to keep up with the latest trends in technology.
4. (Anxiety/dependence) I get anxious when I don’t have my cell phone.
5. (Anxiety/dependence) I get anxious when I don’t have the Internet available to me.
6. (Anxiety/dependence) I am dependent on my technology.
7. (Positive attitudes) Technology will provide solutions to many of our problems.
8. (Positive attitudes) With technology anything is possible.
9. (Positive attitudes) I feel that I get more accomplished because of technology.
10. (Negative attitudes) New technology makes people waste too much time.
11. (Negative attitudes) New technology makes life more complicated.
12. (Negative attitudes) New technology makes people more isolated.
13. (Preference for task switching) I prefer to work on several projects in a day, rather than completing one project and then switching to another.
14. (Preference for task switching) When doing a number of assignments, I like to switch back and forth between them rather than do one at a time.
15. (Preference for task switching) I like to finish one task completely before focusing on anything else.
16. (Preference for task switching) When I have a task to complete, I like to break it up by switching to other tasks intermittently.

*Scoring for item 15 is reversed with strongly agree = 1 and strongly disagree = 5.*
Appendix D: Permission to use Survey

Dear Dr. Rosen:

Hello, my name is Stephen Hickson, and I am in the process of studying the relationship between teacher self-efficacy in the classroom with the integration of technology in the classroom. During my research, I have read your studies, and I wanted to request permission to use your survey in my study. I wanted to contact you and inform you of my desire to use your survey prior to sending a formal letter. I believe that your survey is, by far, the most comprehensive survey that I have encountered to date.

Thank you for your time and consideration. I look forward to hearing from you.

Sincerely,

Stephen Hickson
Appendix E: Permission to use Survey

Dear Dr. Tschannen:

Hello, my name is Stephen Hickson, and I am in the process of studying the relationship between teacher self-efficacy in the classroom with the integration of technology in the classroom.

During my research, I have read your studies, and I wanted to request permission to use your survey in my study. I wanted to contact you and inform you of my desire to use your survey prior to sending a formal letter. I believe that your survey is, by far, the most comprehensive survey that I have encountered to date.

Thank you for your time and consideration. I look forward to hearing from you.

Sincerely,

Stephen Hickson
May 6, 2016

Robert Stephen Hickson
Risley Middle School

Re: Research Permission

Dear Mr. Hickson:

Please accept this letter as confirmation that I am approving your request to conduct research related to teacher self-efficacy and their ability to integrate technology within the classroom. It is my understanding that the study does not have anything to do with students or testing data.

Congratulations on your educational accomplishments. Let me know if I can help you in any way.

HSM:srl