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A Comparison of the Attitudes of Administrators and Teachers on Cell Phone Use as an Educational Tool

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A COMPARISON OF THE ATTITUDES OF ADMINISTRATORS AND TEACHERS ON CELL PHONE USE AS AN EDUCATIONAL TOOL

by

Karen Smith Lockhart

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
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ABSTRACT

A COMPARISON OF THE ATTITUDES OF ADMINISTRATORS AND TEACHERS ON CELL PHONE USE AS AN EDUCATIONAL TOOL

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Youth continue to make up the largest share of the cell phone market in the United States. In 2010, 58% of all 12 year olds owned their own cell phone. By 2015, 88% of teenagers owned a cell phone. Today's teenagers are constantly on cell phones, using them to text, talk, access the internet, and take pictures. Technology is such a part of teenagers' lives that they have been labeled by Marc Prensky (2001) and others as *digital natives*. They have always had technology and cannot conceive of a world without it.

School systems have faced challenges with the new technology and its adaptation for school use. Administrators and teachers have attempted to define the role of cell phones in schools. The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The attitudes of the participants were examined based on the educational role (administrator or teacher) of the participants by age, gender, years of educational experience, level of professional training in technology, cell phone ownership, and type of phone. Participant attitudes regarding perceived challenges to successful cellular technology integration were collected to bring richness to the study.

The statistical analysis of the survey results revealed no significant differences in the attitudes of educational administrators and teachers regarding the use of cell phones in the classroom. Demographic attributes of the participants also revealed no significant differences. The research was hampered by the relatively low number of administrator responses (n=18) versus the responses from teachers (n=382). A larger collection of responses from administrators could have impacted the results of the study.

While the survey results revealed no significance, the open-ended question revealed nine different themes regarding the use of technology. The most prevalent theme emphasized the importance of adequate professional training for educators in the use of cellular technology. It seems possible that the concept of cell phone use in the classroom is evolving. Educators may feel that cell phone use is inevitable, so more training is needed in how to use them for educational purposes. Further research could evaluate the effectiveness of cell phone use training and how usage could impact student achievement.

A COMPARISON OF THE ATTITUDES OF ADMINISTRATORS AND TEACHERS ON CELL PHONE USE AS AN EDUCATIONAL TOOL

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Karen Smith Lockhart

A Dissertation
Submitted to the Graduate School
and the Department of Educational Leadership and School Counseling
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DEDICATION

This work is dedicated to my parents, Mr. and Mrs. Charles G. Smith. They have always believed in me and supported me throughout the many challenges of my life. They were the financial support behind this achievement, enabling me to complete my final college degree, thereby strengthening my future. The one regret from the lengthy dissertation process is that my sweet father passed away before I became Dr. Karen Lockhart. Both my mother and my late father have been, and always will be my greatest supporters.

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The members of my dissertation committee changed over time. I am, however, thankful for those who were involved in the completion of this process. I am

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Dr. Rose McNeese is no longer a part of The University of Southern Mississippi faculty, but without her constant support, this document would not have been completed. Her consistent patience and support inspired me to stick to the process. She has been and will continue to be a friend and mentor.

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CHAPTER I

INTRODUCTION

The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. Today's world has rapidly changed, especially in the area of technology adoption. Today's students are a central part of this technology revolution. They regularly utilize many different forms of technology from computers, to laptops, to gaming systems, to tablets, to cell phones. Technology is always on, and always a part of students' lives, except in schools. The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The attitudes of the participants were examined based on their educational role (administrator or teacher) by age, gender, years of educational experience, level of professional training in technology, cell phone ownership, and type of phone. An open-ended question looked at factors that could influence the use of cell phone technology as an educational tool in the classroom.

This dissertation is organized into five chapters. Chapter I (Introduction) provides an introduction of the research study and includes: Statement of the Problem, Purpose of the Study, Research Questions, Definition of Terms, Delimitations, Assumptions, Justification, and Summary of the chapter. The following chapters include: Chapter II (Review of Literature), Chapter III (Methodology), Chapter IV (Analysis of Data), and Chapter V (Summary and Discussion).

Statement of the Problem

The world of technology use in schools has rapidly changed during recent years. Today's students are a central part of this technology revolution as they regularly and

efficiently utilize many forms of technology devices, including computers, laptops, gaming systems, tablets, and cell phones. School leaders have struggled to keep up with both the challenges and opportunities that have developed in schools among administrators, teachers, and students when students bring their own technology devices to school for personal and education purposes. According to Obringer and Coffey (2007), when students bring their technology devices to school, they face inconsistent attitudes among teachers and administrators with regard to the use of the student devices in the schools. While some educators believe the devices can be both a distraction and a discipline problem, others have embraced the use of the student technology devices into their pedagogy.

As the extent of cell phone use by teenagers has rapidly grown, one of the greatest challenges for public schools has become the need to create cell phone policies that meet both student and teacher needs to successfully utilize the available cellular technology for educational purposes. According to Raby (2008), public school policies for Pre-K through 12th Grade student cell phone use are inconsistent and tend to vary from district to district, school to school, and teacher to teacher. As educators pursue these challenges, they must be mindful that any change in policy is best implemented with full stakeholder support and must be embraced by teachers and administrators within a school (Raby, 2008). The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The attitudes of the participants were examined based on the educational role (administrator or teacher) of the participants by age, gender, years of educational experience, level of professional training

in technology, cell phone ownership, and type of phone. An open-ended question looked at the factors that could influence the use of cell phone technology in the classroom.

Background

Youth made up the largest share of the cell phone market in the United States as early as 2003 (Selian & Srivastava, 2004). Adoption of cell phones by teenagers has continued to climb since that year. Research released in April 2015 indicated, "…88% of American teens ages 13 to 17 have or have access to a mobile phone of some kind, and a majority of teens (73%) have "smart phones" (Lenhart et al., 2015, p. 2). Teenage use of cell phones climbed significantly when the iPhone appeared in the market place in 2007. The phrase "smart phone" designates a cellular phone with increased capacities, including easy access to the internet, as well as applications that multiply the available uses for the owner ("Smartphone," 2016).

With the extent of cell phone use by teenagers rapidly growing, educators have struggled to keep up with both the challenges and opportunities that have developed for school administrators, teachers, and students when students bring their cell phones and other personal electronic devices to school for personal and classroom use. According to Obringer and Coffey (2007), school administrators and faculty opinions regarding the use of student cell phones in schools tended to be mixed. Some teachers believed that cellular technology could be both a distraction and a discipline problem within a classroom, while others successfully incorporated the use of cell phones into their pedagogy (Obringer & Coffey, 2007).

Geary (2008) reported that school teachers have utilized cell phone applications such as YouTube, Polleverywhere.com, Flickr, and Sonic Pics to create avenues of

knowledge for their students. Dolman, a public school teacher interviewed by a reporter for *Administrator Magazine*, stated, "It's a stereotype of teenagers—that you can't trust them with a cell phone. Our experience was that if you give them the opportunity to use them, and you give them guidelines to go with that use, you won't have problems" (Rap, 2010, p. 2).

In contrast, Obringer and Coffey (2007) argued that cell phone applications that manipulate photographs, movies, texting, and social networking have been used inappropriately in schools, giving rise to issues such as sexting, cyberbullying, stealing, drug selling, fighting, posting of pictures on-line, and cheating. With the rise of student discipline issues in schools related to the inappropriate and, often times, illegal use of cell phones, school administrators expressed strong concerns about allowing cell phone use by students in schools or permitting teachers to integrate the technology into classroom instructional practices (Obringer & Coffey, 2007). Thus, the formidable task to develop policies, procedures, and supervision for cell phone use in schools has become a big challenge for school administrators.

Typically, students today have utilized technology for much of their lives. The term digital native has been used to classify student use and their perception of technology (Prensky, 2006). According to Prensky (2006), students have been comfortable with advances in technology, from computers to cell phones. The image of teenagers using their telephones has become a part of American culture. It is only natural that they have continued their love affair with telephones through their wide spread adoption of the cell phone. Teenagers use cell phones for a variety of purposes:

communicating with parents, communicating with friends, playing games, and accessing the internet (Selian & Srivastava, 2004).

In recent years, text messaging has become an exploding aspect of teenage cell phone use, with approximately 90% of all teens who own cell phones participating in the trend (Lenhart et al., 2015). Notwell, director of segment marketing at Verizon Wireless, described the perception of teens and texting in an interview, "Text messaging is not about saying things. It's the note passing of the new millennium. It's the Game Boy of wireless communications for people who think with their thumbs" (Selian & Srivastava, 2004, p. 3). Survey evidence from the Pew Research Center indicated that teenagers prefer texting rather than calling in their relationships with peers. It has become the preferred method of maintaining relationships, with girls texting their peers more often than boys (Lenhart, Ling, Campbell, & Purcell, 2010). Between the years 2006 and 2015, text use by teens went from 50% to 88%. The increase in texting could be linked to the changes in cellular technology making it easier to text, phone applications such as Kik and Whatsap that do not go through phone services, as well as the reduced costs from cellular companies (Lenhart et al., 2015).

In addition to talking and texting, teens also use cell phones as cameras. Harmon (2004) shared, "Almost a million camera phones were sold in 2004, and in many places such phones are already accepted as the norm" (p. 9). Lenhart et al. (2010) reported, "Eighty-three percent of all teenagers with cell phones use them to take and share pictures" (p. 5). Most phones today include the ability to shoot video segments. Desmet (2009) reported that pictures and video paired with easy access to internet sites via smart

phones which easily access the internet can also produce useful performance-based learning opportunities in schools.

Due to the familiarity with cell phone use, students often find it difficult to comprehend why they should not use cell phones at school, particularly in public places such as cafeterias, halls, and media centers (Raby, 2008). Students have argued the inconsistency of not allowing student use of cell phones when staff members are allowed to use them in classrooms, halls, and offices. However, cell phone capabilities have also caused discipline issues in many schools and for many teenagers. O'Donovan (2010) stated:

> It's the Wild West out there in cell phone land, and student behavior mirrors the anything-goes ethos of the internet. If cell phones are allowed on campus, students will be in possession of sexually oriented messages, pictures, videos, and applications. The students are sending messages during class, at lunch, during sports events and at school-sponsored activities. (p. 1)

Sexting, the sharing of sexually explicit photos, videos, email, and text, has become a part of everyday vocabulary in schools (Quaid, 2009). The Associated Press reported that sexting is a widespread problem with approximately 25% of individuals between the ages of 14 and 24 years admitting to participating in cell phone sexting (O'Donovan, 2010). This and other discipline issues have created confusion as to how administrators should act regarding information found on cell phones and transmitted within school buildings. For example, an administrator from Loudoun County, Virginia was charged with failure to report child abuse and felony possession of child pornography. During the course of an investigation, he asked a student to email to him a

sext message from his phone to use as evidence to solve a *sexting* cell phone incident (O'Donovan, 2010). The administrator was eventually cleared, but only after incurring stress and legal expenses because he did what he thought was necessary for the investigation. This case is a clear example of problems faced by administrators dealing with the phenomenon of sexting and other inappropriate information found on cell phones. School administrators have expressed the dilemma they face when their conflicting responsibilities for ensuring a safe and orderly school environment get entangled with community expectations for them "to police what students say on their cell phones" (O'Donovan, 2010, p. 1).

Geary (2008) argued that while administrators may attempt to block student use of school computers for poor behavior, such as cyber-bullying, students can use their smart phones to access web sites such as Facebook and Twitter and continue the inappropriate behavior. Willard (2011) defined cyber-bullying as "the use of digital technologies to intentionally engage in hurtful acts directed towards one another, including sending or posting hurtful material in a manner that is repeated or widely distributed" (p. 1). However, Geary (2008) noted that it "is not the phone itself that is the issue; it is rather the behavior of students" (p. 30). Consequences can still be disastrous if school officials fail to take action to stop cyber-bullying tactics. Kennedy (2010) reported that a high school student in Massachusetts who committed suicide was alleged to have been a victim of bullying and harassment, both electronically and in person. The community blamed the school administration for not taking sufficient action to stop the abuse.

Raby (2008) conducted a study of regulations regarding cell phone use in secondary schools. Results showed "the world's public and private spaces seem to be blending together for discipline issues, such as cyber-bullying, and the inappropriate recording of incidents that are posted on internet sites such as YouTube" (Raby, 2008, p. 15). According to Lenhart (2007), nearly one-third of all teenagers who use the internet have experienced some type of bullying. An additional study found that texting was the most common medium for cyber-bullying (Raskaukas & Stolz, 2007).

At the turn of the century when cell phones advanced to include the capacity to take pictures and record videos, Leung and Wei (2000) investigated possible uses and gratifications of the new cell phone features. The study raised concerns and cautioned school administrators that cell phone use had gone beyond just talk to include a more advanced kind of on-line cyber-bullying—recording inappropriate media images, such as pictures from inside locker rooms, and posting them on the internet for public view. Examples included in the study of on-line cyber-bullying abuse revealed that school administrators and teachers had also been victimized by the use of cell phones to record unflattering images and actions. In some cases, teachers had been deliberately provoked so that students could record their reactions and post them to the internet. Other issues identified in the study by school officials were student discipline problems connected to cell phone usage in the school setting, such as cheating, theft, and classroom inattention and distractions (Leung & Wei, 2000).

Cellular technology has become a part of the American culture, prompting numerous challenges to public norms. It is not uncommon to attend churches, for instance, and find signs posted to silence phones. Graduations and movie screenings are

routinely preceded by a request to silence phones. As a part of cultural change, it is not surprising that school administrators and teachers have continued to experience so many challenges in adapting to cellular technology use in the schools.

The 10th Amendment to the United States Constitution states, "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people" (U.S. Const. amend. X). Interpretation of this amendment has left education funding largely with the individual states and local governments (U.S. Department of Education, 2005). Historically, funding for public education has been the principal responsibility of local governments, with state involvement beginning in the 1970s (Federal Education Budget Project, 2012). During the financial crisis of 2008, revenue streams for education experienced dramatic cutbacks when the housing market collapsed. The dramatic reduction in property taxes from homeowners that began in 2008 reduced the funding available to increase, improve, and maintain technology in schools. Many school systems looking for a solution revisited their policies and practices regarding the use of cell phones in classrooms. Ohler (2011) stated that a new trend had emerged—encouraging students to utilize their own personal technologies in class nicknamed "bring your own technology or device" (p. 1).

As a result of this new direction for technology use in schools, school systems developed policies that allowed students to use their own mobile communication devices, tablets, and computers to benefit instruction in schools. For example, a school system in Forsyth County, Georgia, developed a national model for *bring your own device* initiatives (Ohler, 2011). "Students who are in classrooms involved in a project have been trying out the use of laptop computers, net book computers, gaming consoles that have

the capacity to browse the internet, and cell phones" (Forsyth County Schools, 2012, para. 4).

Several other school districts in Georgia followed this trend. In 2011, Manchester High School, a new school in Douglas County, Georgia, opened for the first time with a *bring your own technology* program in place (Jones, 2011, p. 2). The Douglas County School District information technology director stated in an interview, "If they have them (technology devices), why not use them for learning?" (Jones, 2011, p. 1). Another Georgia school district, Marietta City School District, also developed a bring your own technology program for its schools. The program began as a pilot at the system's high school. High school students were allowed to use their own devices for learning in a pilot program that started in 2012 and was then expanded to other schools in the fall of 2013. Upgrades to the system were established including a wireless network for student and staff access. For their efforts, the Marietta City School District was recognized as the top mid-level school system in the country for technology integration by The Center for Digital Education in 2013 (Roscorla, 2013).

With the increasing use of cell phones, educators are challenged to create instructional technology policies that meet the differing needs and interests of administrators, teachers, and students. As Harmon (2004) stated, "The internet has provided young people with an arsenal of weapons for social cruelty" (p. 2). However, Geary (2008) expressed, "In the case of the cell phone, it is not the device that is the problem, but rather the behavior of the students using the cell phone that needs to be modified in school" (p. 30). Berson and Berson (2005) added, "Youth in today's world do not merely consume information from the diverse media sources which are accessible

online, but rather they are active agents who can manipulate, adapt, create, and disseminate ideas and products through communication technologies" (p. 29). The challenge for public schools is to find a proper balance of solutions for the educational, legal, social, and ethical issues involving mobile technology, particularly cell phone use as an educational tool in classrooms

Purpose of the Study

Public schools are challenged to create cell phone policies that can satisfy the need to control student behavior and provide teachers with the discretion to utilize the available cellular technology within their classroom. Any change in policy is best implemented with full stakeholder support and certainly must be embraced by teachers and administrators within a school (Raby, 2008). The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The attitudes of the participants were examined based on the educational role (administrator or teacher) of the participants by age, gender, years of educational experience, level of professional training in technology, cell phone ownership, and type of phone. An open-ended question looked at factors that could influence the use of cell phone technology in the classroom.

Research Questions

The Research Questions (RQ) for the study include:

1. Was there a difference in the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms?
2. Are administrators and teachers under the age of 35 more willing to utilize cell phones in classrooms than older administrators and teachers?

3. Are male administrators and teachers more willing than female administrators and teachers to utilize cell phones in the classrooms?
4. Are administrators and teachers with significant years of experience, defined as 10 or more years, less likely to utilize cell phones in the classroom than teachers newer to the classroom, defined as less than 10 years of experience?
5. Are administrators and teachers who have received *technology training* for classroom use more likely to utilize cell phones in the classroom than those with little or no training in technology?
6. Are administrators and teachers who own a cell phone or smart phone more likely to utilize cell phones in the classroom than those who do not own a cell phone or smart phone?
7. What factors influence administrators and teachers to use cell phone technology as an educational tool in classrooms?

Definition of Terms

Bring Your Own Technology/Device Program. Students are allowed to bring their personal mobile computing devices—smart phones, laptops, iPads, and tablet personal computers to school (Maxwell, 2013).

Cell phone. A cell phone is defined as a device that utilizes short-wave analog or digital communications to connect to nearby transmitters ("Cell phone," 2016).

Cyberbullying. Cyberbullying is defined as the use of digital technologies to intentionally engage in hurtful acts directed towards one another, including sending or posting hurtful material in a manner that is repeated or widely distributed (Willard, 2011).

Digital immigrant. Digital immigrants are defined as individuals born before 1980 who have faced the challenges of new technology (Prensky, 2001).

Digital natives. Digital natives are defined as individuals born after 1980 who have always known today's technology including computers, laptops, iPods, etc. (Prensky, 2001).

Knowledge worker. Knowledge worker is defined as someone who works with and creates new knowledge (Drucker, 1994).

One-to-One programs. One-to-One programs provide all students in a school, district, or state with their own laptop, netbook, tablet computer, or other mobile-computing device. One-to-one refers to one computer for every student ("One-To-One Definition," 2013).

Public places. Public places in schools are defined as areas such as cafeterias, halls, media centers, and practice fields (Raby, 2008).

Sexting. Sexting is defined as the act of sending sexually explicit materials through mobile phones. The word is derived from the combination of two terms sex and texting ("Sexting," 2016).

Smart phone. A smart phone is defined as a cellular telephone with built-in applications and Internet access. Smart phones provide digital voice service as well as text messaging, e-mail, Web browsing, still and video cameras, MP3 player, video viewing, and video calling. Smart phones can also make use of a myriad of applications giving the phone the capabilities of many computers ("Smartphone," 2016).

Texting. Texting is defined as sending short text messages between cell phones or other handheld devices (Rouse, 2007).

Delimitations

The study was delimited by the design of the survey instrument and the selected sample of schools and participants. The sample participants for this study were located in a large school district within a state in the Southeastern Region of the United States. Each school district located within the selected state was allowed to develop its own policies constraining the use or permitting the use of cell phones for instructional purposes in their schools. The participants in the study included only high school and middle school practitioners. Elementary school practitioners were not surveyed. The survey sample was limited to administrators and teachers. Students and parents were not surveyed. The data gathered were delimited by the questions participants were asked to respond to in the survey.

Assumptions

The researcher assumed that all middle and high school practicing administrators in the selected school district would participate in the study by completing a survey and returning it to the researcher. It was assumed that participants in the study would understand the directions and content of the research questionnaire. The researcher also assumed that survey participants in the study would respond openly and honestly to all items on the study survey without concern that their responses would result in retaliatory behavior by the researcher and/or school district.

Rationale

According to Pew Research Center, nearly two-thirds of all Americans own some form of a *smart phone* (Smith, 2013). The iPad was released in 2010 (Apple Press Release, 2010). By 2013, 34% of American adults owned some form of a tablet

computer (Zickuhr, 2013). The development of the iPad prompted an expanding market for other forms of tablet computers, such as Google, Kindle Fire, Nook, Surface, etc. With the rapid development and expansion of multiple forms of technology and who has access to it, school administrators and teachers are challenged to develop policies and practices to capitalize on student use of cell phone technology in schools. This study hoped to expand the current knowledge base regarding school administrators and teachers' attitudes toward cell phone policies and acceptable use practices for cell phone technology as an instruction tool for increasing student learning.

Summary

With an ever-increasing number of students who own cell phones, teachers and administrators are faced with the challenge of designing policy that balances discipline requirements with appropriate use of cell phones in the classrooms. Chapter I introduced the research study and the purpose of the study-to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. Chapter II (Review of The Literature) provides an overview of the theoretical framework and the related research literature that supports the use of cell phones as an educational tool in the classroom, including discipline problems associated with cell phone use in the classroom, the digital native and digital immigrant debate, the importance of technology training, and the academic and financial possibilities of cell phone use in the classroom. The following chapters include Chapter III (Methodology), Chapter IV (Analysis of Data), and Chapter V (Summary and Discussion).

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The world of technology use in schools has rapidly changed during recent years as students have become more familiar with a wider range of technology. Student personal technology devices include laptops, tablets, watches, and, increasingly, cell phones. School leaders have struggled to keep up with both the challenges and opportunities in schools when students bring their own technology devices to school for personal and education purposes.

The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The attitudes of the participants were examined based on the educational of role (administrator or teacher) of the participants by age, gender, years of educational experience, the level of professional training in technology, cell phone ownership, and type of phone. An open-end question asked administrators and teachers to identify factors that could influence the use of cell phone technology in the classroom. Chapter II (Review of the Literature) includes an Introduction, Education Theory and Technology Use, Technology Attitudes, Challenges of Student-Owned Technology, Possibilities of Student Owned Technology, Impact of Personal Technology and Student Engagement, and Chapter Summary.

Education Theory and Technology Use

Social scientist Drucker (1994) first utilized the phrase, *knowledge worker,* to describe the type of jobs that will be available to individuals in the 21st century. He suggested that this class of individuals will be the predominate class within society.

Drucker (1994) also insisted that knowledge workers need both formal education and manual ability to be successful in their job roles. While some jobs will require extensive education, others will require less. The author claimed that schools will need to assume key roles in society: "The acquisition and distribution of formal knowledge may come to occupy the place in the politics of the knowledge society, which the acquisition and distribution of property and income have occupied in our politics" (Drucker, 1994, p. 64). Drucker further suggested that individuals would continue to focus on acquiring knowledge because advancement in careers will depend upon it. According to Drucker (1994), the acquisition of knowledge will be easier because of the continuing development of new technologies.

Knowledge Building

Schlechty (2001) also discussed the concept of *knowledge work*. He believed that the development of this type of education has increasingly become the central force of many of today's schools. Teachers who consider the development of knowledge work as their primary purpose for their students are changing how they viewed their roles in education by becoming guides and facilitators. According to Schlechty (2001), a teacher's role in education is to model for students how to obtain information and to guide them in creating appropriate new knowledge (Schlechty, 2001).

Scardamalia and Bereiter (2006) focused on the educational emphasis of knowledge building, describing today's world as a knowledge-creating civilization. The authors emphasized that educational strategies that rely solely on communication of knowledge were no longer appropriate for educating students. Students must be taught the skills that will allow them to build knowledge so that they may assume their roles in

the new world of creation of knowledge. Scardamalia and Bereiter (2006) acknowledged the importance of the internet as a tool that will enable students to not only connect with the classroom-based knowledge but also with that of the world's knowledge. Students must change their roles from that of merely learners to the more important role of builders of knowledge and do more than simply copy the work of educators to create their own work.

Newmann and Wehlage (1993) communicated the need and importance of developing common standards for measuring student-created work. They developed and shared the process and the products of student created work and identified it as authentic learning. Additionally, they identified three indicators for judging and measuring students' authentic work. Expressed in question format, the authentic work standards included:

1. Are students constructing meaning and producing knowledge;
2. Are students using disciplined inquiry to construct meaning; and
3. Are students using their work toward production of discourse, products, and performances that have value or meaning beyond success in school. (Newmann & Wehlage, 1993, p. 8)

Theory of Constructivism

Some educators have embraced the theory of constructivism to describe the concept of knowledge building (Brown & Green, 2006). One of the early contributors to the constructivist theory, Jean Piaget, established the foundation of constructivism with the focus on how student-centered learning can lead to the development of new knowledge. Brown and Green (2006) suggested that when teachers are adhering to the

constructivist theory, the responsibilities of the teacher become guiding and supporting the students as they create knowledge.

According to Ford and Lott (2009), the constructivist theory is a broad term that is based on three forms of learning—activity theory, social constructivism, and situated learning. The forms of learning that support the constructive theory are described as:

1. Activity theory suggests that knowledge is created when students interact within their environments in search for answers to their own questions;
2. Social constructivism focuses on the importance of communication among students and teachers and students and students in the classroom environment; and
3. Situated learning builds on the idea that learning is more effective when it is done in collaboration. (Ford & Lott, 2009)

Technology Use in Classrooms

Nanjappa and Grant (2003) suggested that, "a complementary relationship appears to exist between computer technologies and constructivism, the implementation of each one benefiting the other" (p. 39). These authors focused their work on the teacher's role of integrating technology into the constructivist classroom. They noted that teachers serve as guides providing support and scaffolding learning as students work collaboratively within classroom settings (Nanjappa & Grant, 2003).

Strommen and Lincoln (1992) also supported the concept of utilizing constructivist theory to integrate technology into the classroom. They focused on how the nature of work has changed, stating that "the very nature of work changed, with an increasing demand for workers who could master the new technologies and use them to

conduct business that formerly did not require computers at all" (Strommen & Lincoln, 1992, p. 466). The authors also pointed to how the world of today's child has changed. Students are now accustomed to rapid access of information and are no longer dependent upon literature for information alone. This contrast between the vivid learning found by utilizing technology and the more stilted learning that is dependent upon textbooks points to how boring the latter is for students. Srommen and Lincoln (1992) believed that constructivism supports student experimentation, causing them to be creators of knowledge. The authors suggested that integration of technology is difficult for school systems because there is little agreement as to the appropriate use, and there is a lack of appropriate training for teachers in its use.

Schacter and Fagano (1999) stressed the importance of linking the use of technology with well-supported theories of student learning, especially constructivism. They warned that the adoption of technology without critical theories of learning would be ill advised. The theorists acknowledged that technology could be a tool that enables students to construct meaning and to develop higher-order thinking skills. They further suggested that technology could be the tool that helps students resolve the differences between what is expected in project learning and what actually occurs (Schacter & Fagano, 1999).

Schlechty (2001) also discussed the role of technology in education and knowledge building. This author linked knowledge to information and envisioned the role of technology as a tool that helps individuals process the information for meaning. Technology's central role in education has focused on "communicating, storing, retrieving, and processing information" (Schlechty, 2001, p. 31). However, Schlechty

(2001) acknowledged that the role of technology was changing, especially with the advent of the internet. He believed that effective use of the internet will be dependent on the acquisition of three elements: "tools, processes, and skills" (Schlechty, 2001, p. 33). Additionally, Schlechty (2001) argued that without the interaction of these elements and the acceptance of technology by educators there could be little success in using technology effectively in schools.

Craig and Van Lom (2009) took the theory of constructivist learning further, utilizing it to support the integration of mobile technology into the individual classroom. The authors believed that mobile technology, defined as "PDA, smart phone, iPod, and other devices," helped students "work independently with a teacher as a facilitator" (Craig & Van Lom, 2009, p. 2). They further noted, "Constructivist learning theory allows the individual to place worth on mobile technology, rather than mobile technology imposing value on the individual" (p. 3).

Craig and Van Lom (2011) examined what was needed to successfully undertake a mobile technology initiative in schools. They claimed that widespread acceptance of mobile technology by both the school and community was essential for success. Craig and Van Lom (2009) also discussed the essential role that professional development should play in developing effective strategies for the classroom based on constructivist theory. The difficulty of training teachers to integrate mobile technology was raised as a concern due to the possible uncomfortable dissonance between their beliefs in how students learn and the role of technology in the process of learning. They also argued that when there is a merging in these areas, there is a greater chance for the "success of proper integration of technology in schools" (Craig & Van Lom, 2009 p. 7).

Sharples, Taylor, and Vavoula (2005) also looked at constructing a learning theory that supported the use of mobile technology in the classroom. They first examined how mobile technology impacted daily learning of the individual. The authors noted that mobile technology allows learning to be transportable across time and space, as individuals could utilize their mobile devices to learn at any time. It was suggested that students could also utilize the devices to refresh knowledge that they knew and build upon it, creating new components of knowledge. Sharples et al. (2005) also asserted that learning could take place in many different locations because of the speed and access of mobile learning tools. Besides acknowledging the active learning components of mobile technology integration, the authors suggested that mobile learning theory should be based on precepts of the social constructivist learning theory. The authors asserted that effective mobile learning theory must be student and community driven, based on core knowledge, and assessed effectively. Finally, it was recommended that successful mobile learning theory should take into account the availability of the technology within the environment (Sharples et al., 2005).

The purpose of education today is shifting. Students are being called upon, based on constructivist theory, to demonstrate the ability to apply what has been learned through project-based learning. Research is demonstrating that appropriate integration of technology can assist in this type of learning, also known as knowledge work. Educators are being called upon to access technology to improve their practices, assisting students in the production of knowledge work. In many cases, the most available technology is brought to school by students. The availability of student-owned technology can challenge the attitudes of both teachers and administrators as to their appropriate use.

Technology Attitudes

As early as 2000, researchers discussed teacher attitudes toward the use of computers in the classroom. Becker (2000) suggested that in schools and classrooms in which teachers (a) have convenient access, (b) are adequately prepared, (c) have some freedom in the curriculum, and (d) hold personal beliefs aligned with a constructivist theory, computers would be seen as valuable and well-functioning instructional tools. While the belief was undeniably aimed at computers and not cell phone use, the standards of adoption and use are similar and compatible.

Buckenmeyer (2008) stated, "The challenge is not getting technology into classrooms, but instead, getting teachers and affiliated support systems prepared to use their technologies. If change is to occur in classrooms, it must begin with the teacher, not the technology" (p. 8). The author recommended four standards that should be required for successful adoption and integration of technology use in schools, including:

1. Offering relevant, continuous, and timely professional development;
2. Allowing adequate time for teachers to learn how to use new technologies and how to integrate them into the classroom;
3. Offering quality and timely technical support; and
4. Recognizing that the teacher's attitude toward technology is a constant, strong predictor of acceptance of technology integration (Buckemeyer, 2007, p. 8).

Schlechty (2001) discussed the importance of change to the effective integration of technology into the classroom. This author recommended that the same rules, roles, and relationships that shape organizational behaviors are appropriate for schools to fully and successfully exploit and implement the newly emerging technologies. Changing the

status quo rules, roles, and relationships from lectures and books to technology integration, school leaders will be challenged to "change the system of shared beliefs, meanings, values, traditions, and lore in which the structures are imbedded" (p. 35). Schlechty (2001) contended that the key to continuous improvement is that teachers must be trained and empowered with the knowledge and skills to choose and to use a variety of technologies. Prensky (2001) and Tapscott (1998) supported the position that fundamental changes in how classroom instruction is organized and delivered must be a major focus for school leaders for technology to be successfully integrated into schools.

Digital Natives versus Digital Immigrants

Prensky (2001) looked at teenagers and their fascination with technology. He suggested that teenagers of today are fundamentally different than persons born earlier than 1980. Prensky (2001) described them as *digital natives* (p. 1). In most cases, these students have spent their entire lives surrounded by digital technology, literally spending thousands of hours utilizing computers, video cameras, digital music players, and cell phones. Students, as he puts it, are "no longer the people our educational system was designed to teach" (Prensky, 2001, p. 1). The students think and act differently than the average students of yesteryear.

Prensky (2006) explained that educators who were born earlier than 1980 could be described as *digital immigrants*. Like immigrants to different countries, these individuals may adapt to the new technological culture, but will typically retain some type of accent of the past (Prensky, 2006, p. 1). As an example, Prensky (2001) suggested that individuals who must print out and hand-edit documents are digital immigrants. The dissonance between the viewpoints of digital natives and digital

immigrants creates great tension for educators as they try to navigate the new reality. The generation gap between students and teachers and young educators and older educators could play a significant role in the development of policy for the use of cellular technology (Prensky, 2006)

The concepts of digital natives and digital immigrants were also the focus of a study for the Berkman Center for Internet and Society (2010). The center's approach was to look closely at the digital practices of today's students and how these practices are related to law and education. The center researchers described digital natives as those who "grew up with digital technologies, and for whom a life fully integrated with digital devices is the norm" (Berkman Center for Internet and Society, 2010, p. 1). The center further suggested:

> By understanding young people's interactions with digital media such as internet, cell phones, and video games, we may address the issues their practices raise, learn how to harness the opportunities their digital fluency presents, and shape our regulatory and educational frameworks in a way that advances the public interest. (Berkman Center for Internet and Society, 2010, p. 1)

Rosen (2011) discussed the generational aspect of technology adoption. He supported Tapscott's (1998) concept of the *Net Generation* to define those individuals born between the 1980s and the 1990s. These individuals, much like those defined by Prensky, grew up utilizing technology and the World Wide Web (WWW). However, Rosen (2011) took this idea one step further as he defined the individuals coming of age in the 1990s and beyond as the *iGeneration.* These individuals could not conceive of a world without the internet, the smart phone, or other forms of technology. For them, it

has always been there for them, and always will be there. As Rosen (2011) posited, "WWW does not stand for the World Wide Web, it stands for Whatever, Whenever, Wherever" (p. 12). These young people have come of age during the application era. If there is not an application that solves the current problem for them, it is only a matter of time before one is developed. Rosen (2011) believed that the key to education reform is educators tapping into students' love of technology and allowing them to use it in taking responsibility for building knowledge.

Bennett, Maton, and Kervin (2008) presented a different side of the digital native debate. They analyzed the points raised by Prensksy (2007) and suggested that there was a lack of hard evidence to verify their claims that all young people possess high levels of technology skills. They explained that due to the students' levels of experience with technology, their ability to learn has changed drastically from previous generations. The authors suggested that the rhetoric is the core of the digital native-digital immigrant debate. They argued forcefully for further investigation based on solid empirical evidence of the digital native debate prior to educational changes (Bennett et al., 2008).

Kennedy, Judd, Churchward, Gray, and Krause (2008) also examined the concept of the digital native. They suggest that because there is a lack of consistent preference for a type of technology, educators should be hesitant to "adapt materials to the language of the digital native" (p. 10). The researchers' study did reveal that students, however, would like to use their existing technology to assist with their current academic work. The challenge then for educators would be to provide work that can be facilitated by a wide range of technology instruments.

Selwyn (2009) argued that the image of a digital native with expert technology skills is not complete. He stated, "There is mounting evidence that many young people's actual uses of digital technology remain more limited in scope, than the digital native rhetoric would suggest" (p. 372). Young people focus on the ability to use the internet, text, and play video games. Selwyn went on to describe the youth's relationship with knowledge as more passive versus a desire to create new levels of knowledge.

Research by Anderson and Rainie (2012) further suggested that youth's addiction to technology could lead to a wide disparity of both positive and negative effects. The results of their study of technology critics and stakeholders indicated an almost even split in opinions. Of the respondents, 55% agreed that by 2020 young people who were raised with technology will utilize the internet to secure answers to question, learn more, multi-task, and complete both personal and career tasks. In short, they believed that the effect of technology on the student learning will prove to be positive. In contrast, 42% of the respondents in this study found that the dependency of youth on technology will be negative. They expressed dismay, noting that students were adept at short messages, short interactions, and entertainment activities. The critics and stakeholders expressed concerns that young people could lack the necessary social skills for success due to their dependency upon technology. Survey participants for the study also noted a number of issues that should be facilitated by educators: problem solving, the ability to sort through the vast array of information that is available in the digital world, and the ability to bring all of the information together. Collectively, they supported the idea of digital literacy education (Anderson & Rainie, 2012).

Research from the Pew Internet and American Life Project (Smith, 2010) agreed with the issues addressed by Bennett et al. (2008) and Anderson and Rainie (2012) regarding the divide between younger users, or digital natives, and older users, or digital immigrants. They found that "adults younger than age 30 are more likely than those 30 and older to own a cell phone, with 93% of young adults owning cell phones compared to 80% of older adults. Usage decreased as adults grew older" (Lenhart et al., 2010, pp. 9-10).

Gender of Cell Phone Users

Prensky (2001) made the argument that age is a factor in the successful use of cell phone technology as an educational tool. Another factor to be examined in this study is the gender of the user. Styron and Styron (2012) noted, "Literature regarding specific education administration technology and usage and gender appear to be limited" (p. 2). The authors looked at five different studies for trends and found the results to be mixed and not truly based on the gender of the participants. Junco, Merson, and Salter (2010) examined the use of cell phones by college students. While their study reported that females were more than twice as likely as males to own a cell phone, a contrasting study by Lenhart et al. (2010) found that men were more likely than women to own cell phones. When Junco et al. (2010) investigated the differences between males and females with regard to cell phone usage, the results showed that females were more likely than males to use them for social purposes.

The Challenges of Student-Owned Technology

Over 88% of all teenagers in the United States, who are 12 to 17 years of age reported in 2015 that they owned a cell phone (Lenhart et al., 2015). The integration of

cell phones and other technology within classrooms has posed both challenges and new possibilities for school districts. Some of the challenges and issues that school administrators have encountered relevant to technology use in schools include student discipline issues, system-wide costs, and appropriate training for administrators, teachers, and support personnel. These issues have been further complicated when school districts allow students to bring their own technology from home for use in schools, including items such as the laptop, tablet, and cell phone.

Discipline Issues

Educators have found themselves dealing with numerous issues regarding the appropriate use of technology in the classroom, especially with cell phones (Geary, 2008). Technology issues that school administrators, teachers, and students struggle with include cyber-bulling, sexting, the posting of inappropriate pictures on line, and cheating. These issues are difficult to resolve due to vague legal requirements and the complex and excessive entanglement for each individual incident.

Geary (2008) clarified, "In the case of the cell phone, it is not the device that is the problem, but rather the behavior of the student using the cell phone that needs to be modified in school" (p. 30). Cyber-bulling episodes have been featured in the news for a number of years. For example, in 2003 a young man filmed himself in a *Star Wars* parody using a golf ball retriever. Unfortunately, a fellow student found the video and posted it to *Kazza*, a peer-to-peer file-sharing network (Pike, 2008). *Star Wars* fans immediately made changes to the video and posted the revised video to the network. Unfortunately for the young man, three students from his school reposted it to the internet while at school. The *Star Wars* dancer then became the object of ridicule and

embarrassment at his school. It was later reposted to YouTube (Pike, 2008). While this episode occurred in Canada, it would not be uncommon to find similar incidents in the United States.

A different type of episode occurred in Florida when a male student in an instant of fury posted inappropriate pictures of his former girlfriend on the internet. The young woman suffered embarrassment at school. The tension created by the incident further increased at the school when the young man was charged with possession and distribution of pornography (Richards & Calvert, 2009). Cyberbullying incidents were easier for schools to control in the past because the individuals needed access to computers to post hurtful and harmful remarks about others. Today, bullies carry their own personal computers with them with instant access to the internet via media packages on the modern smart phones. Other features of these types of phones include cameras, access to applications, and texting. Taken together, these features make it easier for students to bully and harass other individuals ("What is cyberbullying," n.d.).

Willard (2011) noted that there was little difference in today's world between real life and digital life. Whereas bullying has always been an issue for educators, it is particularly difficult to control in the digital age. Willard suggested three reasons for the bullying. First, the widespread use of cell phones by teens who are driven and determined to cyber-bully others makes it difficult for adults to control. Second, young people do not always recognize the remarks they make on internet are permanent and have the potential for widespread distribution. Finally, the widespread adoption of social media by teenagers makes information regarding bullying very difficult to obtain and control (Willard, 2011).

The bullying cases in Canada and Florida are examples of potential discipline issues that expose administrative concerns about electronic information, control of technology, and individual rights of citizens guaranteed by the United States Constitution. Based on the first 10 amendments to the Constitution, as well as relevant case law, students should reasonably expect the following protection rights while at school: freedom of speech, freedom from undue search and seizure, and right to privacy. Administrators are called upon to search for information contained within phones but are unclear about potential limits of investigations due to the rights of students.

Traditionally, discipline problems involving freedom of speech issues have tended to center on activities that have occurred within the schools. However, student adoption of computers, cell phones, and tablets has raised questions dealing with what has been termed cyberspeech. Cyberspeech can be defined as speech that is "related to or used in on-line communication" (Emrick, 2009, p. 2). This type of communication, common to social networking sites, raises many questions for administrators in schools today. Discipline decisions must reflect standards found in case law. In *Tinker v. Des Moines School District* (1969), the Supreme Court held that students "do not shed their constitutional rights at the schoolhouse gate" (p. 1). It also held that while on campus, student expression would be protected, as long as it did not materially and substantially disrupt the educational process (LaMorte, 2008). The concept of substantial disruption is joined by two other potential court tests, true threats or fighting words. Further cases clarified the holdings from *Tinker v. Des Moines* (1969). For example, in *Bethel School District v. Fraser* (1986), the court held that speech that was lewd and suggestive was not protected under the *Tinker* standard (LaMorte, 2008). *Hazelwood School District v.*

Kuhlmeier (1988) again dealt with the concept of protected speech. The court found that information defined as school-sponsored speech could be restricted. The court did proscribe that in the case of editorial speech, limitations must be based on legitimate pedagogical concerns (LaMorte, 2008).

In the case of *Morse v. Frederick* (2007), the court drew distinctions about student freedom of speech. It stated, "While children assuredly do not shed the constitutional rights…at the schoolhouse gate …the nature of those rights is what is appropriate for children in school" (p. 11). Based on court decisions, it "then appears that education's right to discipline student speech depends on the intersection of two variables—place and kind" (Pike, 2008, p. 10).

Educators are often asked to respond to speech that originated off campus, but then is brought on campus. The courts have been reluctant to restrict speech that is constructed in the privacy of citizens' homes. However, the courts have held it to be reasonable to restrict speech that raises the level of threats of violence within the schools. The courts held that the government's role in providing safety becomes the overriding concern. A number of courts, therefore, are less prone to differentiate between on-campus and off-campus speech. Instead, they are defaulting to the tests found within *Tinker v. Des Moines School District* to reach conclusions (Pike, 2008). In that case, the court held that in order for school officials to justify censoring speech, they "must be able to show that [their] action was caused by something more than a mere desire to avoid the discomfort and unpleasantness that always accompany an unpopular viewpoint" (p. 2). This allows schools to forbid conduct that would "materially and substantially interfere

with the requirements of appropriate discipline in the operation of the school" (*Tinker v. Des Moines School District*, 1969, p. 2).

Educators have often been placed in a quandary about freedom of student speech with regard to technology. The Supreme Court has been reluctant to take up cases concerning the internet and student speech. As late as 2012, the court declined to review two appeals regarding the internet and student speech. One appeal concerned two cases, *Blue Mountain School District v. JS ex rel. Snyder* and *Layshock v. Hermitage School District*. The companion cases dealt with incidents involving material posted on-line that described principals in inappropriate terms and language. The third case dealt with students versus student abuse over the internet. The court declined to hear the two appeals without comment, allowing the lower court decisions to stand (Walsh, 2012, p.1). This refusal highlights the concerns of educators because lower courts have handed down a wide variety of decisions based on how technology had affected individuals. Unfortunately, there is a lack of consistency in how the courts have reached their opinions despite initially looking to the *Tinker* decision for guidance (Pike, 2008). This inconsistency of decisions forces educators to use the guidelines from *Tinker v. Des Moines* to make decisions on technology discipline. They must decide if information found within a designated cell phone caused a substantial disruption to the school environment, or if it substantially affects the rights of others (Pike, 2008).

The case of *Beussink v. Woodland R-IV School District* (1998) illustrated relevant issues associated with the internet and discipline. Beussink created a website that used inappropriate language to criticize the school that he attended. He did not display the website at school; however, a fellow student showed Beussink's website to a teacher.

Despite the fact that the comments did not concern any individual teacher, nor was the information produced on campus, the level of school disruption caused Beussink to receive discipline (Pike, 2008). While this case did not concern the use of cell phones, it could point to future issues because technology advances in smart phones have created portable access to the internet and generated greater possibilities of disruption for the school environment.

In the case of *J.S. v. Bethlehem Area School District* (2002), the Pennsylvania court ruled, "Where speech that is aimed at a specific school and/or its personnel is brought on the school campus or accessed at school by its originator, the speech will be considered on–campus speech" (p. 10). Student Swidler created a website that was offensive in its abusive criticism of a teacher within his school. The court system did not consider the threats made on the website to be serious. However, Swidler lost his appeal of school discipline because the court focused on the substantial disruption of school standards, due in part to the teachers' absence from school because of her emotional injuries (Pike, 2008).

In a third case, *Emmett v. Kent School District* (2000), the court suggested that the out of school nature of the internet placed discipline "entirely outside of the school's supervision or control" (Pike, 2008, p.11). That standard was difficult for administrators because it was reflective of a website created and accessed at home. With new cellular technology, websites are accessible everywhere. The blurring of lines concerning on-campus and off-campus behavior is difficult to define. Speech that is created for the internet can be accessible at school with media packages available on smart phones. Transforming issues pertaining to speech and technology may require some definition of

technology-enhanced speech. One author suggested that speech should be defined as either *active telepresence* or *passive telepresence* (Pike, 2008). Active telepresence reflected speech that was intended to directly impact the campus environment through remote means. For example, one could define videos taken of school fights and then posted as active telepresence. Utilizing the *Tinker* prescriptions, administration then could decide if the active telepresence resulted in a significant disruption to the school day (O'Donovan, 2010).

Besides issues of protected speech, education administrators are faced with issues concerning information found on cell phones during the course of investigations of discipline violations. O'Donovan (2010) expressed the following concerns regarding cell phone use in schools:

1. The ability to search the contents of a cell phone;
2. Student rights to privacy; and
3. Administrative responsibilities regarding the content of information found on cell phones.

If the case of *New Jersey v. T.L.O*. (1985) is to be considered the guiding precedent for search and seizure of students, then educators must follow its two-prong test when searching the content of cell phones. The first prong requires that the search must be justified at its inception. The second prong requires that "the search, as actually conducted, was reasonably related in scope to the circumstances which justified the interference in the first place" (*New Jersey v. TLO*, 1985, p. 10). Administrators appear to have met the justified at its inception standard:

1. If a cell phone was found in violation of a school ban on possession, or

2. If the use of the phone was in violation of school rules that regulated its use; or
3. If the phone was reasonably related to an incident under investigation that required pertinent information (Willard, 2011).

Relevant case law on searching student phones is not broad in scope. However, James (2009) shared that courts have applied the *T.L.O.* standard to numerous cases involving purses, lockers, backpacks, clothing, and cars. Cell phones could be considered legally as similar items. However, the Supreme Court case of *Riley v. California* in 2014 may have sent a different message to school systems regarding searches of student cell phones. Mr. Riley was stopped for a routine traffic issue. As a part of the stop, Mr. Riley was searched, as was his cell phone. For several years, courts have held that police officers could search individuals who were in custody as part of an incident to arrest standard very similar to the reasonable suspension standard found in *New Jersey v. T.L.O.* (1985). However, in the *Riley* case, the Supreme Court held that the police had gone too far and violated Mr. Riley's protection right against unlawful search and seizure. Due to the large amount of available information on a cell phone, police should adhere to the probable cause standard; when searching a phone LaMorte (2014) suggested that while the case is not specifically about education, it should be viewed by educators as a possible future standard, making a search of a cell phone different from a search of a backpack, purse or other physical space (p. 2).

While there remains a small body of law that identifies standards for cell phone abuses, there is substantially less available for use and disposal of information found within a cell phone. For example, administrators seem to be unclear as to their

responsibility if examples of sexting are found while looking for evidence of video taping of student fights. James (2009) also discussed a lack of clarity about student expectations of privacy in regards to information stored on their cell phones.

Administrative concerns feed a desire to see phones banned. Kemerer (2012) has suggested that in light of the difficulty of discipline issues related to cell phones, administrators could ban their use on campus. He also suggested that while this is a step that is legally available, it is probably not practical. The author has found this to be especially true in light of the educational uses of cell phones on campus. Kemerer (2012) noted also that while cell phone use may be limited by rules regarding how and when they may be used, it may still be hard to enforce, noting "during classes, in bathrooms, or in locker rooms" (p. 2), as examples of problem areas.

However, Schrock (2008) developed a presentation that supported the disruptive technology adoption cycle and explained that the cycle is "where tools become available, students use the tools at home and at school, the school responds with bans, the use of the tools spreads, and finally education responds with a version or way of using the tool that is compatible with teaching" (p. 2). By the time school systems realized how to embrace new tools for instructional purposes and spent large sums of money to acquire such tools, they had already become obsolete (Schrock, 2008).

School Owned Technology Adoption and Cost

The state of Maine began a program in 2002 where all middle school students were given laptop computers to utilize both at home and in the classroom (Connerty-Marin, 2009). The program was expanded in 2009 to serve high school students. As a result, the state of Maine announced that it would purchase 71,000 thousand laptops for

students to assist them in improving achievement. However, the shift in the economic environment of 2008 called that program into question. As school districts looked for areas to control within their budgets, the costs for repair and replacement of the technology skyrocketed. One superintendent in Maine School Administrative District No. 28 noted that the district had to pay $56,000 for repairs to student computers at the district's high school. In response, the principal of the school instituted several new policies to reduce future damage repairs ("School districts struggle," 2012).

The Possibilities of Student-Owned Technology

Bring Your Own Technology/Device Programs

Budget restraints of 2008 caused some school systems to examine bring your own technology/devices programs to fill the gap created by budget deficits in school systems. For example, the Alvardo Texas School District started providing laptops to students in grades four through eight in 2007; but faced with the economic challenges of the recession, the district instituted a bring your own technology program. Ullman (2011) shared that students in New Cannan High School, Connecticut were also invited to provide their own technology. With a down turn in the economic status of the district, they could not provide enough technology resources for all students within classrooms. Ullman (2011) reported that the *bring your own technology* program was a solution for their technology needs.

Despite statistics that showed that 88% of all young people who were ages 12 to 17 owned or had access to a cell phone, some parents could not afford to provide their child with a device (Lenhart et al., 2015). Devaney (2010) suggested that businesses and community groups could be invited to support such initiatives for students who cannot

afford to purchase cell phones or tablets for work in classrooms. School systems that agree to allow students to use cell phones in classrooms are working to resolve issues such as security and different product bases, such as iPhones and Droids (Ullman, 2011). Students are being required to sign appropriate use contracts in districts such as Forsyth County, Georgia, and New Canaan, Connecticut. Forsyth County School District in Georgia also created a separate wireless network to divide student work from school records and private information. The system allowed the students to access the internet without using a password, while still enabling monitoring for appropriate student use. A positive by-product of the use of individual devices has been a decline in discipline problems related to personal technology since the technology is not concealed and is used in schools (Clark, n.d.). Forsyth County also made use of their technology integration to maintain learning during weather interruptions. Students in Forsyth were encouraged to go to a school system program titled *It's Learning* to locate posted lessons from their teachers. Learning continued despite weather interruptions, negating any need to make up missed days of education. Students in Douglas County, Georgia, are also utilizing their own devices at New Manchester High School (Douglas County School System, 2016). Like Forsyth County, New Manchester High School installed an internet filter that prohibits student use of inappropriate sites.

As the United States economy has improved since its downward spin in 2008, school systems are again looking at the concept of one to one programs for educational technology (November, 2013). These programs are designed so that districts distribute personal technology to all students, allowing them to use it both in class and usually at home. November (2013) suggested that these programs must be undertaken with great

care. The issue must be more about the learning culture and less about the device for it to be successful (November, 2013). Quillen (2010) discussed the adoption of bring your own technology/device policies for schools. He noted that there are many issues that must be resolved before districts adopt cellular initiatives, including purpose, community support, teacher buy-in, professional development for teachers, and how many students own or have access to phones.

Impact of Personal Technology and Student Engagement

Despite the challenges that can be linked to student use of personal technology, such as cell phones, districts are looking at the technology for its ability to effectively improve education. Prensky (2004b), noted:

> Today's high-end cell phones have the computing power of a mid-1990's PC (while consuming only one-hundredth of the energy…). Even the simplest, voice-only phones have more complex and powerful chips than the 1969 on-board computer that landed a spaceship on the moon. (p. 1)

Prensky (2004b) referred to cell phones as *Computers in the pocket* that have the potential for transforming classrooms. Citizens in the United States have tended to be more focused on lap-top use rather than on the use of the cell phone for computing purposes, with the exception of young people. These *digital natives* utilize their phones for activities such as texting, shooting videos, taking pictures, and looking for information. Prensky (2004a) argued that educators should make use of phones, rather than banning them from the classroom, as the vast capabilities of smart phones can be used for constructive education purposes. For example, the researcher disclosed that in several countries cell phones are used for language training, especially English. Texting

is a strategy that has been used as student response units, for quick assessments of learning, and for academic reminders. Prensky (2004a) also noted that with the capabilities of smart phones, students have instant access to all sources of resources from dictionaries to graphing calculator applications. It was noted that the cameras built into today's smart phones have the capabilities to assist students with all manner of creating learning products.

Prensky (2004b) suggested that teachers should not focus on learning how to use the latest in technology, such as smartphones, because they will not be able to keep up with the speed of change. Instead, the role of the teacher should be to direct their use in classroom and access the products that students produce utilizing them. The author also suggested educational activities that could be used with podcasting, instant messaging, and cameras. Prensky (2007) stated,

> There needs to be a *useful division of labor* around the emerging technologies. Teachers need to work with students to understand how the technologies work, what they offer, and to understand how to include them in assignments. Students need to do the work of actually producing things in these new technologies and media. The teachers and students need to work together to create evaluation criteria and rubrics. (p. 42)

Daggett (2012), from the International Center in Leadership Education, noted in a presentation before administrators in Cobb County, Georgia, the foolishness in not utilizing cell phones in the classroom. He reported that with advancing technologies, it is impossible to make policy that will effectively prevent its use. Nastu (2011) noted that the qualifying difference in cell phone learning was that the technology is always

available, calling it “true anytime, anywhere learning” (p. 1). Few individuals leave them at home, enabling students to instantly access information, whereas laptops and the newer tablets may not be available when needed.

Kolb (2011) was an opponent to the use of the cell phone in classrooms but changed that position for several reasons. The researcher recommended that less time should be spent on teaching students how to use technology, while more time should be spent on teaching. Kolb (2011) also suggested that cell phone use could be more economical for school districts. Another finding was that when school districts utilize student owned technology, they are not spending money on technology that can be rapidly outdated. Additionally, it was found that the integration of student owned technology was important because of the affinity of students for their phones, which heightens student motivation to learn thus increasing classroom engagement.

Cell phone skills such as texting, utilizing video and photography, and accessing the internet for resources could be required by future employers. By actively utilizing cell phones in the classroom, teachers could model the appropriate use of the phones while demonstrating an understanding of students’ individual needs. Kolb (2011) further reviewed additional activities and instructional strategies for cell phone use in classrooms, including (a) oral recordings and assessments, (b) student organization, (c) classroom response units, and (d) photo projects. Kolb (2011) summarized her observations: “A basic cell phone can be the Swiss army knife of digital learning tools” (p. 41).

It is clear that many new and different strategies for education can be implemented using technology. The key, however, lies in the results. Does technology

integration improve student achievement? What are the roles of school administrators and teachers in the implementation of technology within a school?

Sauers and Mcleod (2012) studied the impact of technology integration on student achievement. They examined closely the use of *one-to-one* initiatives for factors that could be relevant to the use of cell phones in the classroom. After collecting information from studies of programs across the United States, they found that the use of technology in schools showed improvements in writing, literacy, math, student engagement, attendance, and behavior.

The International Society for Technology in Education (ISTE) presented a policy brief in 2008 that details what it described as the *Indelible Link* between technology and student achievement (ISTE, 2008). Researchers for the organization explored 20 years of data concerning the integration of technology into education. Included in this study was information from published journal articles that also concluded that significant improvements were demonstrated in math, reading, and literacy when technology was included in schools. The results noted, "The integration of education technology provides students with 21st century skills to be productive and competitive in the work place" (ISTE, 2008, p. 2).

As noted previously, education is focusing today on project-based learning or knowledge work to improve student achievement. Researchers have found that personal technology can be an effective tool to produce project-based learning and increase student engagement. It has also been noted that student ownership of personal technology, especially cell phones, continues to soar. As more and more students own

technology, the need for cell phone policy that is useful for both administrators and teachers becomes apparent.

Policy Development

The challenge for educators with regard to technology has been to develop policy that answers the questions related to discipline and cost while supporting the integration of technology into the classroom. Researchers (Obringer & Coffey, 2007; Raby, 2008) have investigated the differences of opinions among students, teachers, and administrators regarding policy about cell phone use including: use of phones within classrooms and public places, discipline policies regarding use, and the personal use of cell phones by teachers. Raby (2008) concluded that more research was needed to look closely at the opinions of all stakeholders regarding the use of personal technology in the classroom if that is the direction a school system desires to seek.

Raby (2008) concluded that there were clear differences of opinion among students, teachers, and administrators regarding cell phone use. Much of the discussion centered on the concept of space and the appropriateness of technology use within certain areas. Student participant focus groups accepted that cell phones and MP3 players could be a distraction within the classroom. However, because the technology was such an integral part of student life, students found it difficult to understand why technology could not be used within non-classroom spaces, such as halls, cafeterias, and media centers. Teachers and administrators were found to be in closer agreement about the use of electronics throughout buildings during the school day, as electronic devices were thought to be not essential parts of student learning. However, some teachers expressed concern that administrators were not aware of the dynamics of the individual classrooms

and the issues within them. Those teachers expressed a wish for discretion with regard to the use of technology within the classroom.

Raby's (2008) research also noted a lack of student and teacher input in the formulation of technology policy. The lack of participation in policy formulation made complete electronic bans difficult for some stakeholder groups to accept. Raby (2008) reported three distinct observations emerged from her findings:

1. Rules pertaining to electronics need clear rationales;
2. Cell phones and MP3 players were considered different in functions and rule making should take into account these differences; and
3. Students should be educated about appropriate uses of technology in public places. They also need further education about the potential uses and abuses of the technology. (p. 29)

It is important to note that the differences between the two devices have been blurred due to the advent of smart phones. Raby's (2008) research has supported the need for further work to create effective cell phone policies for all.

Obringer and Coffey (2007) looked at administrative perceptions of cell phone policy in their study *Cell Phones in American High Schools: A National Survey*. Two hundred high school principals from all 50 states participated in the survey. A number of interesting findings were presented:

1. A majority of all school districts had some sort of cellular policy; principals believed that the majority of parents were supportive of the policy;
2. Teachers often used their cell phones in the classroom for non-school related business;

3. Discipline actions for inappropriate cell phone use varied greatly; and
4. Policies had not been developed for inappropriate uses of cell phone cameras (Obringer & Coffey, 2007).

Obringer and Coffey (2007) also noted,

> Schools will be pressed to stay ahead of this fast-moving technology. A policy on cell phone use adopted only a few years ago may be outdated by today's technology. As new technology emerges; policies must grow and change as well. (p. 45)

It was interesting to observe that the iPhone was introduced after the Obringer and Coffey (2007) study was completed (Apple Press Release, 2007). The introduction of iPhone technology greatly expanded the types of uses for cellular technology with the emphasis on the development of applications which are similar in nature to computer programs.

Styron and Styron (2008) also examined the roles of principals in the integration of technology within schools relative to standards set by the International Society for Technology in Education (ISTE). The ISTE standards include five tenets:

1. Visionary leadership,
2. Digital age learning culture,
3. Excellence in professional practice,
4. Systemic improvement, and
5. Digital citizenship.

The International Society for Technology in Education (ISTE, 2008) notes seven factors that are critical for successful integration of technology programs. They include:

1. Effective professional development for teachers in the integration of

technology into instruction is necessary to support student learning;

2. Teachers' direct application of technology must be aligned to local and/or state curriculum standards;
3. Technology must be incorporated into the daily learning schedule (i.e., not as a supplement or after school tutorial);
4. Programs and applications must provide individualized feedback to students and teachers and must have the ability to tailor lessons to individual student needs;
5. Student collaboration in the use of technology is more effective in influencing student achievement than strictly individual use;
6. Project-based learning and real-world simulations are more effective in changing student motivation and achievement than drill-and-practice applications; and
7. Effective technology integration requires leadership, support, and modeling from teachers, administrators, and community/parents.

Styron and Styron (2008) sent questionnaires to 500 principals throughout the United States with a return rate of 37%. Pearson and Spearman correlations were conducted to determine the level of agreement with National Education Technology Standards (NETS-A) of Blue Ribbon School principals and if there was a relationship between use of technology and NETS-A Standards. Independent-sample t-tests were also conducted to determine if the levels of agreement with NETS-A Standards differed by gender. Results of this study indicated high levels of agreement of Blue Ribbon School principals with the NETS-A Standards, females reporting higher levels of agreement then

males. The study also disclosed the need for professional development to support technology integration. (p. 1).

Summary

The purpose of this study was to go beyond the work of Obringer and Coffey (2007) to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The study also addressed questions raised by Bennett et al., (2008) about the nature of the digital native arguments. The work took into consideration the introduction of *smart phones*, such as the iPhone and the Droid. These phones and applications have opened the way for consideration of cell phones as potential educational technology, but they have also increased the ways that cell phones could be used inappropriately. Identifying the multiple perspectives of administrators and teachers could lead to the formulation of new and more effective versions of cell phone policies.

Chapter III addresses the methodology chosen to review differences between administrator and teacher attitudes toward the use of cell phones in the classrooms as educational tools. Chapter IV presents a discussion of the findings based on the research conducted, while Chapter V draws conclusions based on the research and makes suggestions for the future.

CHAPTER III

METHODOLOGY

Introduction

Public schools are challenged to create cell phone policies that can satisfy the need to control student behavior while providing teachers with the discretion to utilize the available cellular technology within their classrooms. The purpose of this study was to conduct a quantitative analysis comparing the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms. The researcher developed survey instrument used for the study focused on the attitudes of administrators and teachers based on their role by age, gender, years of educational experience, the level of professional training in technology, cell phone ownership, and type of phone. Administrators and teachers were given the opportunity to respond to an open-ended question asking participants to identify factors that could influence the use of technology as an educational tool in classrooms.

The purpose for Chapter III is to explain the methodology for the research conducted in this study. The chapter includes the research study elements of Research Questions, Participants, Instrumentation, Analysis of the Data, Multiple Regression Analysis, and Summary of the Chapter.

Research Questions and Hypotheses

The research questions and hypotheses upon which the study focused are detailed below. The survey instrument was developed utilizing items that addressed these research questions:

1. Was there a difference in the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms?
2. Are administrators and teachers under the age of 35 more willing to utilize cell phones in classrooms than older administrators and teachers?
3. Are male administrators and teachers more willing than female administrators and teachers to utilize cell phones in the classrooms?
4. Are administrators and teachers with significant years of experience, defined as 10 or more years, less likely to utilize cell phones in the classroom than teachers newer to the classroom, defined as less than 10 years of experience?
5. Are administrators and teachers who have received *technology training* for classroom use more likely to utilize cell phones in the classroom than those with little or no training in technology?
6. Are administrators and teachers who own a cell phone or smart phone more likely to utilize cell phones in the classroom than those who do not own a cell phone or smart phone?
7. What factors influence administrators and teachers to use cell phone technology as an educational tool in classrooms?

Participants

Permission was obtained from the Director of C-Stem, Assessment, and Research at a school district of a state in the Southeastern Region of the United States to survey administrators and teachers from 10 high schools and 10 middle schools within the school district regarding cell phone use in the classroom as an educational tool (Appendix A). Additional permission for the study was obtained from the Institutional Review

Board (IRB) of The University of Southern Mississippi (Appendix B) prior to the collection of survey data. The selected school district has over 100,000 students with 17 high schools and 25 middle schools. It was the 24th largest school district in the United States at the time of the study (About the Cobb County School District, 2015). The demographics of the district were diverse with less than half of the students describing themselves as Caucasian. Forty-five percent of all students participated in the free and reduced lunch price program. This number reflects the approximate number of students living at the poverty level in the school district. The transiency rate for the school district during the 2014-2015 school year was 22.64% (About the Cobb County School District 2015).

Instrumentation

A survey was designed by the researcher to determine the attitudes of administrators and teachers pertaining to the use of cell phones within the classroom (Appendix C). A small group consisting of one middle school administrator, one high school administrator, one middle school teacher, one high school teacher, and one technology integration specialist was asked to assist in designing the survey. The survey questionnaire (Appendix C) consisted of three sections. Section One consisted of 16 questions assessing attitudes of participants towards the use of cell phones in the classroom. Questions were developed utilizing a 5-point Likert-type scale with values ranging from *strongly disagree* (1) to *strongly agree* (5). Section Two of the survey questionnaire (Appendix C) generated data about teacher and administrator demographics: role in school, age, gender, experience in education, professional training in the use of technology, ownership of cell phones, and ownership of smart phones.

Section Three of the survey gave participants the opportunity to address their concerns and comments utilizing an open-ended question about factors that influenced the use of technology in the classroom for educational purposes.

Prior to administration, the survey was reviewed by an expert panel of administrators and teachers from a variety of high schools and middle schools within the selected county who were not participating in the research project. The purpose of the review panel was to determine face and content validity of the developed survey. A second group of administrators and teachers was asked to participate in a pilot study utilizing the survey questionnaire. During the pilot phase of the study, a Cronbach's alpha test was run on the results to determine reliability and internal consistency. Necessary adjustments were made to the survey based on the review panel's input. Three inconsistent questions included in the pilot survey were deleted to improve the Cronbach's alpha score for the survey questionnaire for the study. The ability to reproduce the results from the Cronbach's Alpha test run during the pilot phase has been limited by the age of the study. The original license for the statistical program expired prior to the completion of the study document. Additionally, the age-purchased in 2004 and declining capability of the computer that was utilized for the study has prevented the retrieval of the data.

Procedures

After receiving approval of both the Cobb County School System (Appendix A) and the Institutional Review Board of The University of Southern Mississippi (Appendix B), the researcher contacted the principal within each of the selected schools to ask for his/her assistance in the administration of the survey on their selected date. Principals

who gave approval for the study to be conducted in their school were asked to schedule a date for the administration of the revised survey to both teachers and administrators within the selected schools. The principals were given a packet of information, including cover letters explaining the development and purpose of the survey (Appendix D), the informed consent letters (Appendix E), an information sheet discussing the procedures (Appendix F) to use in the administration of the surveys including oral directions, the surveys, and return envelopes. In preparation for the study, the selected principals who were approved for the study received emails to confirm that the survey packages had been delivered and secured until the study commenced. Participants were asked to read and sign the informed consent letters. After the surveys were distributed to the participants and completed, the surveys and informed consent letters were secured at the individual schools until the researcher collected and secured the surveys in a locked file cabinet.

Data from the surveys were entered into the statistical software program SPSS by the researcher. The data were analyzed to determine if there were any statistically significant differences between the attitudes of teachers and administrators regarding the use of cell phones by:

1. Age
2. Gender
3. Level or years of educational experience
4. Professional training in the use of technology
5. Ownership of cell phone or smart phone.

Additionally, participants were asked to respond to the open-ended qualitative research question concerning factors that could influence the use of technology in the classroom. Data for the open-ended question were analyzed by determining the frequency of themes that were raised by teachers and by administrators. The frequency results were then ranked highest to lowest to determine the most frequent responses for teachers and administrators.

Analysis of Data

The statistical software program SPSS was used to analyze the data obtained from the distributed surveys. Simultaneous multiple regressions were run for both administrator and teacher groups. The regressions compared usability scores with demographic factors. An ANOVA was also run to compare the two target groups. Significance was determined by the 0.05 level. Qualitative information was grouped to analyze any trends found in the results from the qualitative question.

Summary

The methodology for research on cell phone use in the classroom was included in this chapter. The design, implementation, and analysis of the surveys for administrators and teachers within selected schools have been discussed. Chapter IV will focus on the results of the analysis of collected data. Chapter V will review the study, discuss the findings, report the conclusions of the study, and make suggestions for policy development and future research.

CHAPTER IV

ANALYSIS OF DATA

Introduction

Schools continue to be challenged by the ever-present cell phone use of teenagers. The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. Research Question 1 asked the question: Was there a difference in the attitudes of administrators and teachers by role on the use of cell phones as an educational tool in classrooms? Research Questions 2, 3, 4, 5, and 6 explored administrators' and teachers' attitudes on cell phone use as an educational tool in the classrooms by demographic factors of age, gender, years of educational experience, level of professional training in technology, cell phone ownership, and type of phone. Research Question 7 asked administrators and teachers to identify factors that could influence the use of technology as an educational tool in the classroom.

Sample Characteristics

The study was conducted in a school district of a southeastern state utilizing the responses of administrators and teachers from eight high schools and nine middle schools to survey questions regarding cell phone use in the classroom as an educational tool. Permission was obtained from the Institutional Review Board of The University of Southern Mississippi (Appendix B) as well as the school district (Appendix A), prior to the collection of survey data. The selected school district is one of the largest in the United States with over one 100,000 students (About CCSD, 2015). The selected schools represent a broad cross-section of the diversity found in the district.

School Demographics

The eight high schools and eight middle schools that participated in the study came from throughout the district. Student body size varied from 2,732 (High School D) to 836 (Middle School J). Table 1 suggests the socio-economic level of the reporting schools based on the percentage of students receiving free and reduced lunch.

Table 1

Free and Reduced Lunch Rate For Participating Schools

Variable	School Population	Percent of Participation
A. High School	2,177	20.72
B. High School	1,538	31.27
C. High School	1,828	10.50
D. High School	2,732	5.97
E. Middle School	1,238	5.33
F. High School	2,035	11.60
G. Middle School	976	40.32
H. Middle School	996	40.36
I. Middle School	809	64.15
J. Middle School	836	35.77

Table 1 (continued).

Variable	School Population	Percent of Participation
K. Middle School	898	13.81
L. Middle School	1,163	.05
M. High School	2,125	45.60
N. Middle School	889	11.36
O. High School	2, 267	60.30
P. High School	2,141	30,64
Q. Middle School	1,308	84.40
R. High School	1,984	83.20

Note: Georgia Department of Education 2014

Participant Demographics

A total of 410 questionnaires were returned to the researcher. Data collection included responses from 392 teachers, as well as 18 administrators. Demographic factors of the two groups were analyzed to determine if the selected factors were related to the use of technology in the classroom. These factors included: age, gender, years of experience in education, level of technology training, ownership of a cell phone, and ownership of a smart phone. As shown in Table 2, administrator ages ranged from 30 to 50 plus, with the majority of administrators listing their age as 50 years or older. Table 2 further revealed that the age range for teacher participants was broader, ranging from 20 years to 50-plus years.

Table 2

Age of Participants

Variable	Administrator Frequencies	Percentages	Teacher Frequencies	Percentages
20-29	0	0	39	9.9
30-39	5	27.8	106	27.0
40-49	5	27.8	110	28.1
50+	8	44.4	137	34.9

Note: Total (N= 410), Administrators (n=18), Teachers (n=392)

The gender demographic of both administrators and teachers heavily favored females, as commonly demonstrated in the education profession. See Table 3.

Table 3

Gender of Participants

Variable	Administrator Frequencies	Percentages	Teacher Frequencies	Percentages
Female	13	79.2	263	67.1
Male	5	27.8	129	32.9

Note: Total (N= 410), Administrators (n=18), Teachers (n=392)

Table 4 demonstrates that, as could be expected, administrative participants tended to have more years of educational experience than teachers. Experience categories for the teacher participants reflect a broader range of years in education.

Table 4

Years of Educational Experience of Participants

	Administrator Frequencies	Percentages	Teacher Frequencies	Percentages
0-5	1	5.6	43	11.0
6-10	1	5.6	82	20.9
11-15	4	22,2	97	24.7
16-20	4	22.2	74	18.9
21+	8	44.4	96	24.5

Note: Total (N= 410), Administrators (n=18), Teachers (n=392))

The level of training in the use of technology was similar for both the administrator and teacher categories, with the majority of both administrators and teachers indicating that they had some professional training in the use of technology. However, as seen later in Table 11, additional appropriate training in the use of cell phone technology was the most frequently mentioned theme from the open-ended question. Table 5 reflects the frequencies and percentages of the survey information on technology training.

Table 5

Level of Professional Training in the Use of Technology for Participants

Variable	Administrator Frequencies	Percentages	Teacher Frequencies	Percentages
No Training	0	0	16	4.1
Some Training	11	61.1	263	67.1
Extensive Training	7	38.9	113	28.8

Note: Total (N= 410), Administrators (n=18), Teachers (n=392)

Demonstrating the popularity of cell phone technology, 100% administrators and teachers indicated that they owned a cell phone, with a strong majority of participants indicating ownership of a smart phone. Table 6 indicates frequencies and percentages for the demographic variables analyzed as a part of the study.

Table 6

Participants' Cell Phone Ownership and Type of Phone

Variable	Administrator Frequencies	Percentages	Teacher Frequencies	Percentages
Owns Phone	18	100	392	100
Does Not Own Phone	0	0	0	0

Table 6 (continued)

Owns *Smart Phone*	17	94.4	353	90.9
Does Not Own *Smart Phone*	1	5.6	39	9.9

Note: Total (N= 410), Administrators (n=18), Teachers (n=392)

Analysis of Data

The survey of respondents was designed with 16 Likert-scale items (Appendix C) to assess the attitudes of administrators and teachers regarding the use of cell phones as educational tools in classrooms. Utilizing survey data, a Cronbach's Alpha test was run to determine internal consistency. The overall alpha was .70. See Table 7 for results. During the analysis stage, question 16 was eliminated because it was found to be a duplicate of question 10, which preceded it. Questions 4, 11, 12, 13, and 14 were negatively worded within the Likert scale portion of the survey. The responses to those questions were reverse scored to be consistent with the other items so that the average scores could be calculated. Questions 2, 3, and 9 were eliminated because they reflected the issue of age, which was better represented using descriptive statistics presented in Research Question 2, as its own, independent variable. Table 8 represents the means and standard deviations for the responses to questionnaire items from administrators. Table 9 represents the means and standard deviations for responses from teachers to survey data.

Table 7

Cronbach's Alpha Study-Data

Survey Questions	Cronbach's Alpha if Item Deleted
Q7 Cell phones should be used in the classroom.	.748
Q6 Student use of cell phones in the classroom will improve student engagement.	.642
Q5 Teachers are properly trained in the use of cell phone technology for instruction.	.691
Q10 The majority of students have cell phones that could be used in the classroom for instructional purposes.	.673
R4 Many students cannot afford cell phones so they cannot be used for instructional tools.	.684
R12 Teachers need training to use cell phones in the classroom for instruction.	.728
R11 Use of cell phones in the classroom for instruction will be distracting.	.634
R13 Cell phones have no place in the classroom.	.633
R14 Students will use their cell phones for harmful practices if allowed in the classrooms.	.649

Table 8

Means and Standard Deviations of Administrator Responses

Survey Question	Mean	SD
4. Many students cannot afford cell phones; they cannot be used as instructional tools.	3.83	1.04
5. Teachers are properly trained in the uses of cell phone technology for instruction.	2.11	.900
6. Student engagement of phones in the classroom will increase student engagement.	3.94	.802
8. Male teachers are more comfortable with cell phone technology than females.	1.50	.785
10. The majority of students have cell phones that could be used for instructional purposes.	3.94	.802
11. Use of cell phones in the classroom for instruction will be distracting.	3.72	.958
12. Teachers need training to use cell phones in the classroom for instruction.	1.55	.615
13. Cell phones have no place in the classroom.	4.66	.840
14. Students will use their cell phones for harmful practices if allowed in the classroom.	3.33	1.02
15. Students will use their cell phones as directed in the classroom.	3.61	.777

Note: Administrators (n=18)

Table 9

Means and Standard Deviations of Teacher Responses

Survey Question	Mean	SD
4. Many students cannot afford cell phones, so they cannot be used as instructional tools.	3.59	1.01
5. Teachers are properly trained in the uses of cell phone technology for instruction,	1.92	.88
6. Student use of cell phones in the classroom for instruction will improve student engagement.	3.58	1.06
8. Male teachers are more comfortable with cell phone technology than females.	1.69	.938
10. The majority of students have cell phones that could be used in the classroom for instructional purposes.	3.91	.903
11. Use of cell phones in the classroom for instruction will be distracting.	2.81	1.09
12. Teachers need training to use cell phones in the classroom for instruction.	1.99	1.06

Table 9 (continued)

13. Cell phones have no place in the classroom.	1.80	1.07
14. Students will use their cell phone for harmful practices if allowed in the classroom.	3.06	1.10
15. Students will use their cell phones as directed in the classroom.	3.24	.928

Note: Teachers (n=392)

Multiple Regression Analyses

The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The dependent variables were constructed to reflect the usability scores for administrator and teacher groups. The responses to the Likert-scale portion of the survey (Appendix C) were averaged using SPSS to determine the dependent variables for administrators and teachers.

A simultaneous multiple regression was run using SPSS for both administrator and teacher data to determine if there was a relationship between the dependent variable, termed usability scores, and the independent variables of age, gender, years of experience in education, professional training in the uses of technology, and ownership of smart phones. Tables 10 and 11 reveal the results from the multiple regression analysis.

Table 10

Regression Analysis of Administrator Data

	B	t	Sig.
Age	-.094	-.742	.473
Experience	-.028	.-295	.773
Male	-.201	.908	.382
No Phone	-.667	-1.41	.182
Extensive Training	-.225	-1.058	.311

Note: Administrators (n=18)

Table 11

Regression Analysis of Teacher Data

	B	t	Sig.
Age	-.057	-1.67	.096
Experience	.002	.057	.955
Male	-.039	-.399	.690
No Phone	-.036	-.399	.690
Extensive Training	.011	.192	.848
No Training	-.207	-1.97	.050

Note: Teachers (n=392)

The results of the simultaneous multiple regression tests run on both the administrator data and the teacher data revealed that the demographic values of: age, gender, experience in education, level of professional training in education, ownership of cell phones, and ownership of smart phones had no significant effect on the willingness of administrators and teachers to use cell phones as educational tools in the classroom. The analysis of administrator data showed F (5, 12) =.968 and R square=.287, $p > .05$. The analysis of teacher data revealed F (6, 385) = 1.25, and R square=.019, $p \geq 05$. Results were based on a low number of administrator responses (N=18) compared with a substantially higher number of teacher responses (N=392). The low participation by administrators potentially limited the results of the study.

The quantitative portion of the research survey failed to show that demographic factors played a role in the willingness of educators to utilize cell phones as educational tools. The research protocol included a qualitative element. Research Question 6 read as follows: "What factors influence the use of technology in the classroom for educational purposes?" Responses came from 282 of the 392 teachers. Additionally, 17 of the 18 administrators responded to the question. Several returned surveys listed more than one point in response to the question. All responses from the individual surveys were first read by the researcher. In the second step, responses were grouped and coded according to similarities or repeating ideas by the researcher. For example, one teacher from middle school G responded to the question "What factors influence the use of technology in the classroom for educational purposes?" by writing, *training of teachers in using the best practices.* A second teacher from middle school E responded, *teacher training on the use and benefits of cell phone use in the classroom*. A third teacher from high school D

stated simply, *teacher training.* Another response from high school A said, *Professional development in the use of more interactive instruction would increase technology uses in the classroom.* A theme described as *professional development need* had emerged based on a total of 74 similar responses from teachers and 4 similar ones from administrators regarding the need for professional development for teachers in the use of cellular technology.

Grouping of similar responses continued. *Availability of technology and resources* became the descriptor for the second theme. Fifty-seven of the responses from teachers and four from administrators were similar enough to be grouped under this category. For example, a teacher from middle school G commented, *Do students have access (individually or through groups) to the technology including apps, iPhone vs. Droid*? An administrator from high school M listed two points that were grouped under the theme of availability of technology and resources. The administrator suggested *availability of IPhones and quality of aps*. Another similar comment came from a high school teacher from school B, who suggested that *variability of data sources* could be an issue.

The third theme described as *lesson relevance* was mentioned by 56 teachers and no administrators. A teacher from high school S wondered if there was a "real role for technology, not just to check the box." Another teacher from high school S questioned, "If the technology used is relevant to what is taught?" Another high school teacher from school D described this theme as, "relevant use of technology-not technology for technology's sake."

Teacher comfort and familiarity with cell phone technology emerged as the fourth theme with 38 teacher responses, as well as five from administrators that were similar enough to be classified together. A teacher from high school C described it as "the teacher's perspective and expertise with technology, not age!" A teacher from high school F echoed Marc Prensky's (2004b) view of teachers' need for familiarity with technology describing the comfort level as "the teacher's ability to let students be the experts." As noted in Chapter III, Prensky (2004b) agreed that teachers should not concentrate on learning the technology, instead concentrating on their leadership of the technology classroom.

A teacher from middle school G succinctly suggested the fifth theme, *teacher buy in and ease of use.* The teacher's response was echoed in the answers from 35 other teachers and no administrators. From middle school O, the teacher described the theme as *the comfort level with technology*. From high school S, a teacher described the issue as *ease of use*. From high school D, the teacher suggested that buy-in must be at all levels, *teachers, administrators, and district*.

The sixth identified response theme of answers to the question of *factors that influence the use of technology in the classroom* was described as *administrative support including policy and cost.* Responses to this question dealt with technology and policy issues and came from 34 teachers and two administrators. One example from a high school teacher of school Q listed *adequate cell phone reception in room for all phones*. From high school P, the teacher addressed both points, *allowances of the technology and network* and *understanding and cooperation of administration when a classroom does not fit what is considered a traditional environment*. From high school C, the

administrator described another issue, *cell signal strength*. Other issues noted included *big pipe web access with extensive Wi-Fi infrastructure,* and ability to use technology without *roadblocks* such as filters on the system's Wi-Fi.

The theme of *maturity, cooperation, and engagement of students;* emerged in the comments from 30 teachers and four administrators. Comments included, *Does it engage* the student properly? from a teacher in high school C. A teacher from high school S added, *Technology needs to fit the class needs, as well as the maturity of the student population.* A middle school teacher from school E added, *maturity, trustworthiness of student* to the discussion theme.

The eighth theme termed *classroom control, discipline, and size* was mentioned in the responses of 26 teachers and one administrator. Comments included, "difficult to keep kids from texting when supposed to be using phones for instructional purposes" from a teacher in high school C. A teacher from high school D added the comment, "blocking websites that distract students" as a possible factor in the use of cell phone technology in the classroom, while a teacher from middle school O suggested that *guidelines for student use and known consequences* would assist with classroom control.

The last theme, *professional challenges including lag time of technology and applications,* was mentioned by 13 teachers and no administrators. From middle school E, a teacher mentioned the issue of compatibility between IOS and Android applications as a professional challenge. The issue of applications, *quality of apps,* was also mentioned by a high school teacher from school M. A response from a teacher at high school C described a district purchased technology instrument that typifies the feelings

expressed in this response, *ease of use and setup. IRespond is a disaster due to the time trying to get it to work.*

A teacher from high school S summed up the responses by saying, *Teachers must use technology in authentic and meaningful ways if they want it to be effective for instruction. This requires careful consideration of student access, the learning goals, possible distractions/problems, and the purpose of incorporating technology.*

Table 12 lists the identified differing themes and frequencies that emerged in response to the open-ended question. These themes will be discussed further as findings and recommendations for future research in Chapter V.

Table 12

Open-Ended Question Responses

Theme	Frequency of Teacher Responses	Frequency of Administrator Responses
Professional development, including time to implement lessons learned.	71	4
Availability of technology and resources.	57	4
Lesson relevance	56	0
Teacher comfort and familiarity with cell phone technology	38	5
Teacher buy-in and ease of use.	36	0

Table 12 (continued).

Administrative support, including policy, and cost.	34	2
Maturity, cooperation and engagement of students.	30	4
Classroom control, discipline, and size	26	1
Professional challenges, including lag time of technology and applications.	13	0

Note: Total (N=410), Administrators, (n=18), Teachers (n=392

Strong concerns were raised in the responses to the open-ended question about the need for professional development in the use of cell phone technology for teachers as well as the availability of technology and resources. The prevalence of concerns regarding professional development suggested that a *t*-test should be conducted to analyze the administrator and teacher data in relation to the need for professional development. Despite being mentioned in the open-ended question, no significant difference was found between the scores of administrators (M=3.22, SD=0.394) and teachers (M=3.04, SD=0.520).

Summary

The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. Additionally, the study investigated the impact of demographic factors of age, gender, the level of experience in education, professional training in the use of technology, ownership of a cell phone, and

type of phone (smart phone*)* on administrator and teacher attitudes on the use of cell phones as an educational tool in classrooms. The results of both a quantitative researcher-created survey and the results of an open-ended question were reported. While the results of the quantitative survey failed to indicate any significant difference between the attitudes of administrators and teachers, it should be noted that only 18 administrator surveys were returned versus 392 teacher surveys. With more administrator surveys completed, the results of the study may have been different. The open-ended question produced nine themes that will be examined further in Chapter V. Findings, conclusions, recommendations for policy and practices, limitations of the study, and recommendations for future research will also be addressed in Chapter V.

CHAPTER V

SUMMARY AND DISCUSSION

Introduction

Today's world of technology has rapidly changed, especially in the area of technology adoption of cell phone use in schools during the last decade. School administrators and teachers have found themselves outpaced by the technology revolution and are challenged to develop appropriate policies and practices to integrate the new technology into classrooms for educational purposes. When students bring their own technology devices to school for educational purposes, they face inconsistent attitudes among administrators and teachers with regard to their use in classrooms. The purpose of this study was to compare the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms. Chapter V is organized into five sections—Summary of the Study, Discussion and Conclusions, Limitations, Implications for Policy and Practice, Recommendations for Future Research, and Summary.

Summary of the Study

Statement of the Problem

The use of technology in schools to improve student learning has been discussed, debated, and challenged since computers were first introduced as support tools for teaching and learning in the late 1900s. Obringer and Coffey (2007) reported that the rapid pace of cell phone development and improvements during the last decade has outpaced the development of appropriate education policy to address cell phone use as an educational tool in schools. This has resulted in school leaders and school boards of

education scrambling to develop appropriate school board policies to address this growing issue.

On one hand, today's students have become a central part of this technology revolution as they regularly and efficiently utilize many forms of technology devices, including computers, laptops, gaming systems, tablets, and cell phones. However, on the other hand, school leaders have struggled to keep up with both the challenges and opportunities that have developed in schools among administrators, teachers, and students when students bring their own technology devices to school for personal and education purposes. According to Obringer and Coffey (2007), when students bring their technology devices to school, they face inconsistent attitudes among administrators and teachers with regard to the use of their devices in the schools. While some educators believe the devices can be both a distraction and a discipline problem, others have embraced the use of the student technology devices into their pedagogy.

School systems across the country have been challenged to keep up with new technology developments and to integrate the technology into curriculum and instruction. To address these needs, educators have increasingly turned to innovative ways to assist with the technology integration into their schools. One creative solution, known as *bring your own technology/device* programs or *one-to-one* programs, has received much attention by educators. These programs allow students to bring their own technology devices to school to be used as educational tools in classrooms. With cell phone use by teenagers rapidly growing, one of the greatest challenges for public schools has become the need to create cell phone use policies that meet both student and teacher needs. According to Raby (2008), public school policies for Grades Pre-K through 12 on cell

phone use in classrooms are inconsistent and tend to vary from district to district, school to school, and teacher to teacher. Although educators have explored new ideas to meet the rapid rate of technology development, the pace of new technology continues to escalate, while policy development for schools moves slowly. The challenge now is for administrators and teachers to address their own attitudes about student owned technology and to be open to creative ways to successfully integrate new technology into classrooms.

Purpose Statement

The purpose of this study was to compare the attitudes of administrators and teachers on cell phone use as an educational tool in classrooms. The study included both quantitative and qualitative research methods. Research Question 1 asked-*Was there a difference in the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms?* Research Questions 2-5 further examined the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms to see if the attitudes would be affected by demographic factors of age, gender, years of educational experience, level of professional training in technology. Research Question 6 examined two additional variables—ownership of a cell phone and type of cell phone (smart phone). Research Question 7 was an open-ended question that asked administrators and teachers to identify factors that could influence the use of technology in classrooms.

Research Questions

The research questions for the study were as follows:

1. Was there a difference in the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms?
2. Are administrators and teachers under the age of 35 more willing to utilize cell phones in classrooms than older administrators and teachers?
3. Are male administrators and teachers more willing than female administrators and teachers to utilize cell phones in the classrooms?
4. Are administrators and teachers with significant years of experience, defined as 10 or more years, less likely to utilize cell phones in the classroom than teachers newer to the classroom, defined as less than 10 years of experience?
5. Are administrators and teachers who have received *technology training* for classroom use more likely to utilize cell phones in the classroom than those with little or no training in technology?
6. Are administrators and teachers who own a cell phone or smart phone more likely to utilize cell phones in the classroom than those who do not own a cell phone or smart phone?
7. What factors influence administrators and teachers to use cell phone technology as an educational tool in classrooms?

Summary of Procedures

Study Design

Population. The study was conducted in a large suburban school district located in a southeastern state. The district was the 24th largest school district in the United

States serving over 100,000 students. Study participants (Table 2) included administrators and teachers from 9 of the 17 high schools and from 8 of the 25 middle schools located within the school district. Of the 17 schools that participated in the study, a total of 410 (n=18 administrators and n=392 teachers) agreed to participate as research subjects for the study.

Data Collection. For this study, participating school administrators and teachers were surveyed using a researcher developed survey instrument (Attachment C). The research survey instrument used in the study included three sections to assess the attitudes of administrators and teachers regarding the use of cell phones as educational tools in classrooms. Section One of the survey instrument used a 5-point Likert-like scale to assess the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms. Section Two collected demographic factors of participating administrators and teachers to explore the effect of age, gender, years of experience in education, level of professional training in technology, and ownership of a cell phone (smart phone) on the attitudes of the participants. For Section Two of the research survey, participants selected a response from those provided for each item. For Section Three, participants were given the opportunity to respond to an open-ended question that asked administrators and teachers to provide a list of factors that could influence the use of cell phones as an educational tool in classrooms.

Data Analysis. The study used both quantitative and qualitative methods to analyze the collected data. A Cronbach's Alpha test was run to determine the validity of the study. Utilizing the SPSS statistical analysis program, the responses of both administrators and teachers were then analyzed. The dependent variable or usability

score for both groups was computed using the results of the Likert-type scale section of the survey instrument (Appendix C). A simultaneous multiple regression analysis was computed to compare both attitudes of administrators and teachers by the demographic factors of age, gender, years of experience in education, professional training in technology, and ownership of cell phones or smart phones. An ANOVA statistical analysis test was run to compare the responses of both groups by role (administrator or teacher). For the qualitative component of the study, the researcher used descriptive statistics to report the responses of administrators and teachers to an open-ended question asking them to identify factors that could influence the use cell phone technology as an educational tool in classrooms.

Conclusions and Discussion

Research Questions

RQ1. Was there a difference in the attitudes of administrators and teachers on the use of cell phones as an educational tool in classrooms? Analysis of the data failed to show a statistically significant difference between the attitudes of administrators and teachers. Section One of the research survey instrument (Appendix C) asked participants to use a 5-point (1-Strongly Disagree to 5-Strongly Agree) Likert-style rating scale to assess the attitudes of administrators and teachers. The Mean and Standard Deviation scores for each item for both administrators (See Table 7) and for teachers (See Table 8) in the study revealed no statistically significant differences. However, it should be noted that data analysis of Section One of the research survey revealed several strong similarities and, likewise, strong disagreements between the scores of administrators and teachers for individual survey items. For the purpose of discussion, the researcher

organized survey items of administrator and teacher responses by grouping similar survey items into four categories—Positive Instructional Impact (Survey Items 6, 10, and 15); Possible Negative Impact in Schools (Survey Items 4, 11, 13, and 14); Professional Training (Survey Items 5 and 12); and Gender (Survey Item 8). The results for the categories of Professional Training and Gender survey items were included in the discussion sections for Research Question 3 (Gender) and Research Question 5 (Professional Training).

Positive Aspects of Cell Phone Use (Survey Section One, Items 6, 10, and 15). The Positive Aspects of Cell Phone Use category of participants' attitudes included Survey Section One, Items 6, 10, and 15. The results for Survey Item 6—*Student use of cell phones in the classroom for instruction will improve student engagement,* showed no statistically significance difference between the attitudes of administrators (M=3.94, SD=0.90) and teachers (M=3.58, SD=1.06). However, the results did indicate a strong agreement between the attitudes of administrators and teachers that student engagement in classrooms will improve with the use of cell phones as an educational tool in the classroom.

This finding aligns with the Constructivism Theorists arguments (Brown & Green, 2006; Drucker, 1994; Nanjappa &Piaget, 1993; Scardamalia & Bereiter, 2006, Schacter & Fagano, 1999; Schlecty, 2001; Strommen & Lincoln, 1992; Styron & Styron, 2008) that people produce new knowledge, construct meaning, and develop higher order thinking skills through their active involvement and engagement in authentic learning experiences that encourage experimentation, communication, and collaboration. Craig and Van Lom (2009) and Sharples et al. (2005) supported the finding for Survey Section

One, Item 6 by recommending the integration of mobile technology into individual schools and allowing students to use technology, including cell phones, to connect or engage more actively both in the classroom and beyond the classroom environment.

The second category of Positive Aspects of Cell Phone Use in Classrooms was measured by Survey Section One, Item 10—*The majority of students have cell phones that could be used in the classroom for instructional purposes.* Although the results for this item were not statistically significant, the results for Item 10 indicated the strongest agreement between the attitudes of administrators (M=3.94, SD=0.80) and teachers (M=3.91, SD=0.90) of all survey items. Supporting this finding was research conducted by Lenhart et al. (2010) who found that 88% of teenagers who were 12 to 17 years of age reported owning a cell phone. For many cases, the most available technology to meet the challenges of integrating technology into classrooms was through student owned technology. Also, Prensky (2006) and Rosen (2011) described the students of today as digital natives, or the Net Generation, who have spent their entire lives surrounded by and fully integrated in digital technology, rendering them prepared to successfully use their personal technology devices in classrooms for educational purposes.

However, several other authors (Anderson & Rainie, 2012; Bennet et al., 2008; Kennedy et al., 2008; Selwyn, 2009) cautioned educators to not assume that digital natives are prepared, but to examine the needs of digital natives and to develop policies and procedures to train teachers and students on the appropriate use and on the basic skills for using mobile technology in schools. Another study completed by Srommen and Lincoln (1992) found that there was little agreement on appropriate use of technology, especially in the area of cell phone use (Styron & Styron, 2008). The dissonance among

these researchers and the findings of this study demonstrate a need for further research in the area of policies and procedures regarding the use of cell phones as educational tool in classrooms. Even though the cautions were communicated, Devaney (2011) and Ullman (2011) agreed that students should be allowed to bring their own technology devices to school, including the cell phone, to use as an instructional tool.

The third category of Positive Aspects of Cell Phone Use in Classrooms was measured by Survey Section One, Item 15—*Students will use their cell phones as directed in the classroom.* The results for Item 15 showed no statistically significant difference between the attitudes of administrators (M=3.16, SD=0.77) and the attitudes of teachers (M=3.24, SD=0.93. However, this finding showed a strong agreement between the attitudes of administrators and teachers with regard to students using their cell phones as directed in the classroom. Although similar, yet not statistically significantly different, the attitudes of administrators and teachers in this study were not congruent with the findings of Geary (2008) who described misuse of cell phones in schools as a constant challenge for administrators and teachers with regard to student discipline issues, including cyber-bullying, sexting, posting of inappropriate pictures on line, and cheating. Willard (2011) noted that bullying was especially difficult to control in the digital age due to the schools' entanglement with Constitutional freedoms and relevant case law (James, 2009; LaMorte, 2008; Willard, 2011). The disagreement of findings in this study and those cited by other authors warrant additional study in this area.

Possible Negative Impact of Cell Phone Use in Schools (Survey Section One, Items 4, 11, 13, and 14). The results for survey Item 4—*Many students cannot afford cell phones, so they cannot be used as instructional tools,* showed no statistically significance

between the attitudes of administrators (M=3.83, SD=1.04) and teachers (M=3.50, SD=1.01). However, the strong similarity of scores for both groups is worth noting. Administrator scores were slightly higher than teacher scores. Perhaps administrators are more aware of the community and school financial concerns for funding new technology developments and the length of time it takes to develop policies and procedures and to train teachers for the integration of new technology developments into classrooms as instructional tools. Schrock (2008) observed that by the time this process was completed, the new proposed educational tool or curriculum could become obsolete.

Many school districts across the country have instituted a *bring your own device to school* program (Ullman, 2011) to speed up the process for technology integration in classrooms. Devaney (2011) also suggested that businesses and community groups could be invited to support initiatives for students who cannot purchase cell phones of lap tops to bring to school. As innovative ways to address technology needs in schools are expanding, more research is needed in this area to identify and study school districts that have successfully implemented such plans.

Survey Section One, Item 11—*Use of Cell Phones in the classroom for instruction will be distracting.* The results for survey Item 11 revealed there was no statistically significant difference between the attitudes of administrators (M=3.72, SD=0.96) and the attitudes of teachers (M=2.81, SD=1.09). It was interesting to note that administrators had stronger attitudes toward cell phones as a distraction in classrooms than teachers. This could be because student discipline issues related to cell phone use in classrooms are usually referred to school administrators to handle. Kemerer (2012) supported the results for Survey Section One, Item 11 by suggesting that in light of

discipline issues related to cell phones, administrators could ban their use on campus or develop strict rules regarding how and when it would be appropriate to use them. Either way, enforcement could be difficult to manage. Geary (2008) clarified that it is not cell phone devices that cause problems in schools, but that it is the behavior of the students using the cell phones that needs to be modified.

Survey Section One, Item 13—*Cell phones have no place in the classroom.* The results for survey Section One, Item 13 showed no statistically significant difference in the attitudes of administrators (M=4.66, SD=0.84) and teachers (M=1.80, SD=1.07). These findings were surprising to the researcher as administrator and teacher attitudes were strongly opposite with regard to cell phones having a place in classrooms. In review of the results of a previous, somewhat similar survey item (Survey Section One, Item 6—*Student use of cell phones in the classroom for instruction will improve student engagement),* the difference between the attitudes of administrators (M=3.94, SD=0.90) supporting cell phone use to improve student engagement were contradicting to the results of administrators (M=4.66, SD=0.84) for survey Item 13 indicating that school administrators believed there was no place for cell phone use in classrooms. Considering these findings, the researcher recommends further research with regard to administrator attitudes toward cell phone use as an educational tool in classrooms.

Survey Section One, Item 14—*Students will use their cell phone for harmful practices if allowed in the classroom*. Results for Survey Item 4 showed no statistically significant difference between administrator attitudes (M=3.61, SD=0.78) and teacher attitudes (M=3.06, SD=1.10) with regard to students using cell phone for harmful practices if allowed in the classroom. Both groups shared similar attitudes that students

will engage in harmful practices with cell phones when allowed to use them in classrooms for educational purposes. Technology issues that school administrators, teachers, and students face in schools typically include cyber-bullying, sexting, posting inappropriate pictures on line, and cheating. Willard (2011) found that real life student discipline issues have not changed over the years, yet it is particularly difficult to control students in the digital age as there are so many entanglements with student rights and case law. In the case of *Morse v Frederick* (2007), the court drew distinctions regarding freedom of speech, "While children assuredly do not shed their constitutional rights…at the schoolhouse gate…the nature of those rights is what is appropriate for children in school" (p. 11). As case law is an on-going process, educators are challenged to stay abreast of new laws associated to cell phone use in schools (Emrick, 2009). The researcher recommends further study in the area of student discipline issues related to cell phone use in classrooms.

RQ2. Are administrators and teachers under the age of 35 more willing to utilize cell phones as an educational tool in classrooms than older administrators and teachers? The results for Research Question 2 showed there was no statistically significant difference between administrators and teachers responses for the demographic factor of *age* regarding the use of cell phones as an educational tool in classrooms. The survey instrument item that addressed Research Question 2 was included in Section Two, Item 2, Demographic Factor—Age

The age range for administrator participants was 30 to 50+ years of age, with the largest percent (n=44.4%) at 50+ years or older; the age range of teachers was 30 to 50+ years, with the largest percent (34.9%) also at 50+ years of age. Although the results of

this study showed that the range of ages for administrators did not include any participants younger than 30 years, the age ranges for teacher participants were broader, including almost 10% (n=9.9%) in the same age range of 20 to 30 years. For teacher participants, the age ranges for the other two categories were almost equally distributed between the other age ranges of 30 to 39 years (n=27%) and 40 to 49 years (28.1%). Administrator age ranges were equal (n=27.8%) for the remaining two categories.

It should be noted that in the state where the study was conducted administrator certification required a past record of teaching experience and successful completion of graduate level degrees in leadership or administration. This could possibly address why the range of ages for administrator participants included in this study was narrower and older beginning at 30 years than teacher participants included in the study. Also, a larger number of administrator responses could have impacted the results of the study.

RQ3. Are male administrators and teachers more willing than female administrators and teachers to use cell phones as an educational tool in the classroom? Findings showed there was no statistically significant difference between administrators and teachers responses based on the demographic factor of *gender (male or female)* regarding the use of cell phones as an educational tool in classrooms. The gender of the participants included 263 females and 129 males. Research Question 3 was addressed in the survey instrument of the study in Section One, Item 8—*Male teachers are more comfortable with cell phone technology than females* and Section Two, Item 3—Demographic Factor—*gender*. Participant response choices for Section Two, Item 3 included two categories, either *Female* or *Male*.

For Section One, Item 8, the mean score for administrator (M=1.50, SD=0.79) responses was approximately equal to the mean score for teacher (M=1.69. SD=0.94) responses, with teacher responses only slightly higher. These results showed that teacher attitudes were slightly stronger than administrator attitudes toward the conjecture that male teachers are more comfortable with cell phone technology than females. The results for Section Two, Item 3, Gender, for administrators (n=18) there were 13 (79.2%) females and 5 (27.8%) males, and for teachers (n=392) there were 263 (67.1%) females and 129 (32.9%) males that participated in the study. The gender demographic for both administrators and teachers heavily favored females, as commonly demonstrated in the education profession.

RQ4. *Are administrators and teachers with significant years of educational experience, as defined as 10 or more years, less likely to use cell phones as an educational tool in the classroom than teachers newer to the classroom, as defined as less than 10 years of experience?* Based on a simultaneous regression analysis run on both administrative data and the teacher data revealed that the demographic value of years of experience in education and other factors (age, gender, level of professional training in education, ownership of cell phones, and ownership of a smart phone) showed no statistically significant effect on the willingness of administrators and teachers to use cell phones as an educational tool in classrooms (See Tables 9 and 10). The low number of administrator participants (n=18) when compared to the high number of teacher participants (n=392) limited the results of the study. It is recommended for future studies to include a higher number of administrators to impact the study.

RQ5. Are administrators and teachers who have received professional training in classroom use of technology more likely to use cell phones as an educational tool in the classroom than those with little or no training in technology? Results showed there was no statistically significant difference between administrator and teacher responses for *level of professional training* in technology regarding the use of cell phones as an educational tool in classrooms. The survey instrument indicators that provided data for this research question were located in Section One, Items 5 and 12, and Section Two, Item 6 of Demographic Factors—P*rofessional training in technology use.*

For Section One, Item 5 and Item 12, participants were asked to rate their attitude toward the given statement with a range from Strongly Disagree (1) to Strongly Agree (5). The mean score and standard deviation for Item 5 for administrators and for teachers, showed that administrator's attitudes (M=2.11, SD=0.90) toward *teachers being properly trained in the uses of cell phone technology*, was slightly higher than teacher's attitudes (M=1.92, SD=0.88) indicating there was no statistically significant difference. Similar results were also found for Section 1, Item 12 for Administrators (M=1.55), SD=.615) and for teachers (M=1.99, SD=1.06)—*Teachers need training to use cell phones in the classrooms for instruction*. Data analyzed for Section One, Items 5 and 12 of the survey instrument showed there was only a slight difference in the mean scores for administrators and teachers with no statistically significant difference noted. However, a study conducted by Styron and Styron (2008) among Blue Ribbon Schools found a need to focus professional training for educators on the use of cell phone technology as a tool for teaching and learning in schools.

For Section Two, Item 6, participants could choose from three options—*no, some,* or *extensive training* levels for their responses. Data were reported as a percent of administrator and teacher responses for each item. Results for the level of professional training in the use of technology for participants (See Table 5) revealed that a majority of both administrators (n=11 or 61.1%) and teachers (n=263 or 67.1%) selected *some training* as their current level of training in the use of technology in the classroom. For this item it was interesting to note that 100% (n=18) of the administrator participants had some or extensive technology training, while 4.1% (n=16) of the teacher participants had *no* technology training. The finding that some teachers had no training in technology could be related to administrator and teacher certification standards in the state where the study was conducted. At the time of the study administrator certification for education required that applicants include technology training to obtain a state certification for school administration. However, teacher certification standards did not include technology proficiency.

The need for providing on-going professional development and support for educators to be able to successfully prepare students for the rapidly changing world workforce, especially in the area of technology, has been supported by many researchers (Drucker, 1994; Scardamalis & Bereiter, 2006; Schlecty, 2001; Strommen & Lincoln, 1999; Styron & Styron, 2008). Drucker (1994) focused on the roles of schools in educating and preparing students for their roles and jobs in the 21st Century. His work supported the findings of this study as he stressed the importance of providing basic and ongoing formal professional training for developing the knowledge and skills of educators in the area of technology to be able to prepare students for the new workforce

skills of the 21st century. Schlechty (2001) and Scardamalis and Bereiter (2006) also acknowledged that the role of technology in education was rapidly changing, especially with the advent of the internet. These authors challenged educators to become effectively trained in the use the internet to be able to provide the tools and develop the processes and skills to educate students and allow them to connect with classrooms and the world.

RQ 7—*What factors influence the use of technology in the classroom for educational purposes?* Section Three of the research instrument used in this study was an open-ended question that addressed Research Question 7. Findings showed no statistically significant difference between the scores of administrators and teachers for each of the indicators identified by this open-ended survey question. As seen in Table 11, *Open-Ended Question Responses*, the top factor that emerged from participants' responses revealed a strong need for *professional training* for both administrators (n=4 of 17) and teachers (n=71 of 282) on the use of cell phone technology as an educational tool in classrooms. A related theme, *teacher comfort and familiarity with cell phone technology,* ranked fourth among the themes that emerged through the frequency of administrator (n=0) and teacher (n=38) responses. Although the *need for professional development* was prevalent among the responses for both groups, an individual t test conducted for this item revealed no statistically significant difference between the scores for administrators (M=3.22, SD=0.394) and teachers (M=3.04, SD=SD=0.520).

The findings of several researchers (Brown & Green, 2003; Craig & Van Lom, 2009; Drucker, 1994; Nanjappa & Grant, 2003; Piaget, 1993; Schacter & Fagano, 1999; Schlecty, 2001; Stromen & Lincoln, 1999; Styron & Styron, 2011) agree that professional training for the successful integration of technology as a tool for teaching

and learning is key to successful implementation in schools. Piaget (1993) developed the theory of constructivism that asserted that people produce knowledge and form meaning based on their experiences. The constructivism theory covered learning theories, teaching methods, and education reform and greatly impacted how teachers teach and how students learn. The role of the teacher became that of a supporter and a facilitator of learning as they challenge students to become critical thinkers and assimilate and accommodate new knowledge and experiences (Brown & Green, 2003).

Drucker (1994) supported the constructivism theory and suggested that administrators and teachers should receive specific professional training on the use of technology as a resource and tool for instruction and learning in classrooms as teachers and students work collaboratively to process new knowledge. Schlechty (2001) and Scardamalis and Bereiter (2006) added that constructivism theory goes hand in hand with the use of technology resources to help individuals process information for meaning and to create new knowledge, especially through the use of the internet. Schacter and Fagano (1999) stressed the importance of linking the use of technology with well-supported theories of student learning, such as constructivism, warning that the adoption of technology without critical theories would be ill advised. A study conducted by Styron and Styron (2011) added that administrators and teachers needed specific professional training and support to successfully integrate technology in schools.

It is evident from the results of this study and the research of others, that administrators and teachers need training and support for technology integration as they struggle to change teaching strategies, develop different kinds of lesson plans, and utilize technology resources needed to accommodate the constructivism theory and to meet

students' needs for technology integration, especially with the use of the internet and cell phone as tools for educational purposes in the classroom. As noted in the fourth ranked theme of factors that could influence the implementation of technology in the classroom—*teacher comfort and familiarity with cell phone tec*hnology, it was apparent that teachers (n=38) acknowledged and expressed a stronger need for professional training to successfully integrate cell phone technology than administrators (n=5) did in this study. Prensky (2004b) agreed that the teachers' perspective and their expertise in allowing the students to be the experts in the classroom are key to the implementation of the constructivism theory and to the use of cell phone technology in the classroom.

RQ6. *Are administrators and teachers who own a cell phone or smart phone more likely to use cell phones as an educational tool in the classroom than those who did not own a cell phone or smart phone?* Findings showed there was no statistically significant difference between administrators and teachers responses for *ownership of a cell phone or smart phone* in technology regarding the use of cell phones as an educational tool in classrooms. Research Question 6 was addressed in the survey instrument for this study in Section Two, Items 7—*Own a Cell Phone* and Item 8—*Own a Smart Phone.* Participant responses for each of these items were either *yes* or *no.* Since both administrator and teacher responses for Item 7 were 100% *yes* for owning a cell phone, the researcher did not further analyze the responses for differences in attitudes of the participants. For Item 8, *Own a Smart Phone*, 94.4% (n=17) of the administrator participants (n=18) and 90.9% (n=353) of the teacher participants (n=392) indicated *yes* they did own a Smart phone. Since the results were so similar between administrators and teachers, the researcher also chose not to further analyze these data.

However, it can be concluded from the results of this data that both administrators and teachers have demonstrated a strong acceptance of cell phone technology. Schlechty (2001) argued that without the acceptance of technology by educators, there will be little success in using technology effectively in schools. With this in mind, it could be concluded from the findings of this study for Research Question 6, that administrators and teachers could be open to considering cell phone technology as a tool for education in classrooms.

Research Question 7. What factors influence the use of technology in the classroom for educational purposes? This open-ended research question allowed administrators and teachers to identify the factors they perceived could influence the use of technology as an educational tool in classrooms. Of the 410 research participants, 17 of the 18 administrators and 282 of the 392 teachers submitted at least one response to the survey question providing potential for further discussion. The researcher grouped the responses according to similarities or themes that emerged, then rank ordered the frequencies of the responses from largest to smallest. Of the nine different themes that emerged (Table 11), the need for *professional development* (n=74) was most prevalent, with *availability of technology and resources* (n=57) second, and *lesson relevance* (n=56) third. Responses for both administrators and teachers focused on the professional development needs and the logistics of implementing the technology in the classroom as factors that had the greatest impact on the implementation of technology as an educational tool in classrooms.

Professional Development. Data collected for Research Question 7 revealed a strong desire of administrators and teachers for professional development to better

understand the appropriate and relevant uses of technology as an educational tool in classrooms in order to be able to successfully integrate applications and programs within their classroom lessons. A study conducted by Adada and Styron (2008) supported this finding, "… for teachers to effectively use the computer and the internet, they need to be well trained" (p. 2). They also recommended that developers of training should pay special attention to the needs of the digital native students regarding technology, as many of them will be more advanced in the uses of technology than the educators due to the students' familiarity with technology and the various devices.

Prensky (2004b) recommended that professional training on technology for teachers should concentrate on student product outcomes created through the use of technology in classrooms rather than how the mechanics of technology actually works. This thought aligns clearly to the constructivism theory developed by Piaget (1993) and discussed previously in section related to Research Question 5.

Systems working with the *bring your own technology/device* initiatives could benefit from professional training on technology integration with conference support—sending teachers to state technology conferences such as those held in Mississippi, Alabama, Georgia, Florida, South Carolina, and Kentucky. School systems contemplating *one-to-one programs* could benefit from the technology plan featured in Fulton County, Georgia, where the county's technology plans feature phases of implementation, including an emphasis on professional training for staff members in the use of the proposed technology. As a part of the planned roll out, the school system entered into a contract with Kennesaw State University to provide training to teachers with their *ITeach* program. In this program, master technology teachers trained the

school system teachers in the use of technology and applications prior to the distribution of the devices to all students. Devices were issued to students after one full year of teacher training (Fulton County Schools, 2015).

The issues of *resources and consistency of support* are related. Teachers expressed concerns about having the right resources for technology, including platforms and applications. It is important for systems to have a systematic approach to providing structures for teachers to increase their confidence in the use of technology. It is also important for systems to provide continuity of support. In the 2012-2013 school year, the school system of Cobb County, Georgia, announced that it would begin a *bring your own device/technology* program in three targeted middle schools. Schools were to implement technology concepts to improve student achievement. Follow-up training for district staff use, however, has been minimal, consisting primarily of resources listed on the district website. Despite the lack of training for a *bring your own device* technology initiative, servers for the program were initiated in all schools.

Issues concerning student maturity and behavior with technology were listed, but not as frequently as expected based on literature readings. Administrator responses were diverse but did not focus on the concerns of student maturity and behavior, as expected. Issues concerning discipline were not mentioned as often as expected by either administrators or teachers, potentially indicating a recognition that technology will continue to play a critical role in the education of today's digital natives, and that educational institutions must develop policy that manages the use of technology in schools.

Limitations

The design of the survey instrument and the implementation instructions could have affected the responses and significance of the survey. Despite a pilot study utilizing the same instructions, two issues became apparent after the project surveys were collected. The first issue concerned the printing of the survey. To better utilize resources, the survey was printed on one sheet of paper with questions on both sides. Several surveys had to be eliminated, because participants did not complete the reverse side of the survey. Survey instructions did not specifically speak to the need to fill out both sides of the survey paper. Also, the instructions did not specifically address the need for both administrator and teacher participation in the survey. Specificity concerning administrator (principal and/or assistant principal) participation could have affected the lack of statistical significance of outcomes. No statistically significance result was found for either the teacher responses or the administrator responses with regard to the effect of demographics on the usability of cellular technology (Research Questions 2-6). It should be noted that with more administrator responses, the results could have changed. An ANOVA statistical test was also run comparing the responses of both groups, and again, no significant difference in the attitudes of administrators or teachers was found (Research Question 1). As with the regression analysis, more administrator responses could have led to different results.

For the convenience of this study, research subjects were limited to only administrator and teacher participants. However, research (Raby, 2008) supports the involvement of all stakeholders, including students, when initiating change in curriculum and instruction, especially when establishing policies and procedures regarding the

selection and use of technology in schools as an educational tool. The digital native argument made by Prensky (2001) makes clear the importance of technology in the lives of students. The input of student responses could have led to a broader and richer understanding of how cell phone technology could be used in the classroom.

The ability to reproduce the results from the Cronbach's Alpha test run during the pilot phase was limited by the age of the study. The original license for the statistical program expired prior to the completion of the study document. Additionally, the age (2004) and declining capability of the computer that was utilized for the study has prevented the retrieval of the data.

While the preceding limitations are important, the most significant limitation to this study has been the *speed of technology change*. This study was begun in 2009 when the concept of using cell phones in the classroom for technology integration was relatively fresh. Technology and technology trends have changed rapidly since then. The introduction of the iPad in 2010, gave school systems more options. The economic downturn of that period forced school systems to look for alternatives for technology integration into curriculum. The concept of *bring your own technology/device* became a popular method for solving that problem. As stated previously, the 2015 ISTEA conference scheduled multiple presentations related to this concept for convention participants.

While the *bring your own technology/device* initiative is a popular trend, some school systems have revisited the concept of *one-to-one* technology programs. School systems that provided *one-to-one* technology programs issued technology devices to students for use in both the school and the home. The one-to-one technology program

initiatives have assisted school systems in managing technology integration programs, enabling them to solve problems such as appropriate platforms and connectivity.

Recommendations for Policy and Practice

While the results of this study were not statistically significant in the quantitative sense, the themes that emerged from the qualitative component--open-ended question could be used to assist in the development of appropriate practices and policies for the use of cell phones in the classroom. The open-ended research question allowed administrators and teachers to identify the factors they perceived could influence the use of technology as an educational tool in classrooms. Of the 410 research participants, 17 of the 18 administrators and 282 of the 392 teachers submitted at least one response to the survey question providing potential for further discussion and policy consideration.

The recommendations for policy and practice as an outgrowth of this study were derived from the literature and findings of this study. As technology changes occur very rapidly and to keep up with the pace, changes are necessary for superintendents and school boards to address and reduce the long, slow process of change in education, including the development and integration of policy, curriculum, procedures for implementation, professional training, instructional strategies, and assessments related to new technology (Schlechty, 2001). It was noted by Prensky (2001) that the students of the 21st century think and act differently than the average student of the past as a result of their access and use of new technology developments, especially the internet and cell phones. Rosen (2011) recommended that educators tap into students' love for technology and allow them to use it in taking responsibility for building new knowledge. Buckenmeyer (2008) shared that getting technology into classrooms is not the challenge

of education; the challenge is getting teachers and related support systems prepared to use students' technology.

One of the most prominent concerns revealed in this study was the overarching need for initial and on-going professional training for educators with regard to understanding and integrating new technology developments, including cell phone use, in schools and classrooms for educational purposes. Another area for professional training and development is recommended for administrators and teachers on how to teach digital natives using Constructivist Theory teaching and learning strategies and assessments (Prensky, 2001; Tapscott, 1998). It is also recommended that administrators and teachers engage in professional development training based on Constructivism Theory as it relates to the study of new technology integration in classrooms that establishes new roles for teachers and new roles for students for teaching and learning in classrooms that prepare students for 21st century careers (Drucker, 1994; Newman &Wehlage, 1993; Piaget, 1993; Schlecty, 2001).

Recommendations for Future Research

The recommendations for further research on this topic were based on the findings and the limitations of the study. Since the appropriate use of cell phones as an educational tool in schools could have a huge impact on all elements of the school and community, this researcher recommends that future studies include a broader spectrum of stakeholders from the school community in the study, including administrators, teachers, students, parents, district level leadership, and local businesses. Raby (2008) noted the importance of including the opinions of all stakeholders in the development of effective policy regarding the use of cell phones in school.

The development of a research survey instrument should be done with particular focus not only on the content of each item but also the structure of the instrument itself. In an effort to be frugal with available resources for conducting the study, this researcher printed the survey instrument on both sides of the paper without providing clear directions to flip to the back side of the page to continue to the next page of the survey. Consequently, several returned survey instruments could not be included in the study due to being incomplete.

Another miscommunication related to the research survey instrument was the interpretation of who should complete the survey. The researcher intended for all *school administrators*—principal and other school administrators, in the schools selected for the study to complete the survey instrument. Unfortunately, most administrator surveys were completed by only the school principal and not the assistant administrators, resulting in a low response (n=18) of administrator surveys. As previously noted in the results of the study, more administrator responses could have produced some statistically significant results. It is recommended that a greater number of administrator survey responses should be collected as it concerns administrative issues related to reoccurring discipline problems.

The researcher's primary recommendation for future researchers is to compare student engagement with the integration of personal technology in the classroom. Teachers expressed a strong interest in making sure that technology was an integral part of the lesson and not simply implemented for the sake of integration of technology. This will involve appropriate training of teachers, implementation strategies, and further research to evaluate the effectiveness of the use of cell phones as an educational tool in

the classroom. One of this researcher's biggest challenges with this study was the speed that technology develops and changes compared to the lag in educational policy, curriculum development, professional training, and implementation in our schools.

Summary

The study was conducted in a large suburban school district located in the southeastern region of the United States. The school district selected for the study was one of the largest in the country with over 100,000 students representing a broad cross-section of the diversity located in the school district community. Data were collected from 410 subjects, including 18 school administrators and 392 teachers, from 9 middle schools and 9 high schools within the school district.

The research project, entitled A *Comparison of the Attitudes of Educational Administrators and Teachers on Cell Phone Use as an Educational Tool,* was initiated to delve into the possibilities of cellular technology use in the classroom. The researcher investigated if there were differences in attitudes for middle school and high school administrators and teachers. The researcher also investigated differences in attitudes of administrators and teachers based on role and demographic factors by age, gender, years of experience in education, level of professional training in technology, and ownership of a cell phone or smart phone. The research survey also included one open-ended question: *What factors influence the use of technology in the classroom for educational purposes?*

No significant difference was found between the attitudes of administrators or teachers toward the use of cell phones as educational tools in the classroom. Additionally, no statistically significant difference was found in the attitudes of administrators or teachers on the use of cell phones as educational tools in the classroom

based on demographic factors of age, gender, years of experience in education, level of professional training, or ownership of a cell phone or smart phone. While no statistical significance was found in the quantitative part of the study, responses to the open-ended question for both demonstrated openness to the use of cell technology in the classroom if the questions related to training and logistics could be solved.

APPENDIX A

PERMISSION TO CONDUCT RESEARCH

COBB COUNTY
SCHOOL DISTRICT
Empowering Dreams for the Future

P.O. Box 1088
Marietta, GA 30061
Telephone: (770) 426-3300
www.cobbk12.org

July 30, 2013

Ms. Karen S. Lockhart
3070 Branford Court
Marietta, GA 30062

Dear Ms. Lockhart:

Your research project titled, A Comparison of the Attitudes of Educational Administrators and Teachers on Cell Phone Use as an Educational Tool, has been approved. Listed below are the schools where approval to conduct the research is complete. Please work with the school administrator to schedule administration of instruments or conduct interviews.

Schools

Campbell High
Hillgrove High
Kell High
Kennesaw Mountain High
Lassiter High
McEachern High
Osborne High
Pope High
Walton High
Wheeler High
Awtrey Middle
Barber Middle
Campbell Middle
Dickerson Middle
Dodgen Middle
Griffin Middle
Mabry Middle
Palmer Middle
Simpson Middle
Tapp Middle

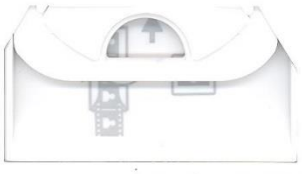
Should modifications or changes in research procedures become necessary during the research project, changes must be submitted in writing to the Academic Division prior to implementation. At the conclusion of your research project, you are expected to submit a copy of your results to this office. Results cannot reference the Cobb County School District or any District schools or departments.

Research files are not considered complete until results are received. If you have any questions regarding the process, contact our office at 770-426-3552.

Sincerely,

Melissa Morse

Melissa Morse
Director of C-STEM, Assessment & Research



APPENDIX B

INSTITUTIONAL REVIEW BOARD NOTICE OF COMMITTEEE ACTION

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.6820 | Fax: 601.266.4377 | www.usm.edu/irb

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **13012203**
PROJECT TITLE: **A Comparison of the Attitudes of Educational Administrators and Teachers on Cell Phone Use as an Educational Tool**
PROJECT TYPE: **Dissertation**
RESEARCHER(S): **Karen Lockhart**
COLLEGE/DIVISION: **College of Education & Psychology**
DEPARTMENT: **Educational Leadership and School Counseling**
FUNDING AGENCY/SPONSOR: **N/A**
IRB COMMITTEE ACTION: **Expedited Review Approval**
PERIOD OF APPROVAL: **01/29/2013 to 01/28/2014**

Lawrence A. Hosman, Ph.D.
Institutional Review Board

APPENDIX C

CELL PHONE USE SURVEY

This study is being conducted to investigate attitudes of administrators and teachers towards the use of cell phone technology in the classroom, as an educational tool. Participation is completely voluntary and may be discontinued at any time without penalty. By completing and returning this questionnaire, you are indicating your willingness to participate in the study. All responses will be anonymous.

Section One:

For each question below, circle the number that best reflects your level of agreement

	SD				**SA**
1. Cell phones could be used in classroom instruction.	**1**	**2**	**3**	**4**	**5**
2. Older teachers are not comfortable with all the capabilities of today's cell phones.	**1**	**2**	**3**	**4**	**5**
3. Veteran educators will find it difficult to adapt to the use of cell phone technology in the classroom.	**1**	**2**	**3**	**4**	**5**
4. Many students cannot afford cell phones, so they cannot be used as instructional tools.	**1**	**2**	**3**	**4**	**5**
5. Teachers are properly trained in the use of cell phone technology for instruction.	**1**	**2**	**3**	**4**	**5**
6. Student use of cell phones in the classroom for instruction will improve student engagement.	**1**	**2**	**3**	**4**	**5**
7. Cell phones should be used in the classroom	**1**	**2**	**3**	**4**	**5**
8. Male teachers are more comfortable with cell phone technology, than females.	**1**	**2**	**3**	**4**	**5**
9. Veteran educators see no reason to incorporate the use of cell phones in the classroom.	**1**	**2**	**3**	**4**	**5**
10. The majority of students have cell phones that could be used in the classroom for instructional purposes.	**1**	**2**	**3**	**4**	**5**
11. Use of cell phones in the classroom for instruction will be distracting.	**1**	**2**	**3**	**4**	**5**
12. Teachers need training to use cell phones in the classroom for instructions.	**1**	**2**	**3**	**4**	**5**

13. Cell phones have no place in the classroom.	1	2	3	4	5
14. Students will use their cell phones for harmful practices, if allowed in the classroom.	1	2	3	4	5
15. Students will use their cell phones as directed in the classroom.	1	2	3	4	5
16. The majority of students have cell phones that could be used in the classroom for instructional purposes.	1	2	3	4	5

Section Two:
Please check responses that describe the participant:

_____ Administrator _____ Teacher

2. Age:

_____ 20-29 _____ 30-39 _____ 40-49 _____ 50+

3. Gender:

_____ Female _____ Male

4. Experience in education:

_____ 0-5 _____ 6-10 _____ 11-15 _____ 16-20 _____ 21+

6. Professional training in technology use:

_____ No Training _____ Some Training _____ Extensive Training

7. Own a cell phone:

_____ Yes _____ No

8. Own a *smart phone:*

_____ Yes _____No

Section Three-In the space provided, please answer the following question:

What factors influence the use of technology in the classroom for educational purposes?

APPENDIX D

LETTER TO SURVEY PARTICIPANTS

Karen S. Lockhart
3070 Branford Court
Marietta, Georgia 30062

Dear Colleague;

I am seeking your assistance. I have been administratively approved by the Cobb County School District to conduct a research study titled *A Comparison of the Attitudes of Educational Administrators and Teachers on Cell Phone Use as an Educational Tool.* A copy of the approval letter is included within the email. I am now seeking the participation of your school in my study. As you are aware, the Cobb County School District has moved forward with implementation of a "bring your own technology" program for all schools. My study has the potential to provide vital information for the district to draw upon for designing professional development opportunities to assist our teachers with this program.

My research study calls for the participation of 10 high school and middle school administrative teams and the participation of 10 high school and middle school teaching staffs. I am, therefore, asking for the participation of your administrative team and teaching staff. Individuals will take a short survey, which will take no more than 10 minutes to complete. I will bring to your school a packet containing surveys, participation letters, and self-addressed envelopes. I am asking that your school secretary be

responsible for collecting the surveys and consent letters. I will be happy to pick them up, once completed.

The data from the study will be analyzed for statistical significance. I will be happy to share the results of the study with you upon completion.

Thank you for your assistance!

Karen Lockhart

APPENDIX E

PARTICIPANT CONSENT FORM

My signature below indicates that I have agreed to participate in the study titled **"A Comparison of the Attitudes of Educational Administrators and Teachers on Cell Phone Use as an Educational Tool"** to be conducted during the Fall Semester of 2013 at my school location.

I understand that the purpose of the research project is to investigate the attitudes of administrators and teachers regarding the use of cell phones for educational purposes versus the demographic factors of age, gender, socioeconomic status, professional experience, technology training, and educational roles of the participants.

Cobb County School District has moved towards implementation of a "bring your own technology program" for all schools. Beginning with the 2012-2013 school year, three middle schools participated in the pilot program. This study can provide additional vital information for the district to draw upon for designing a successful program for long-term use. The Information could also be used to design appropriate professional development for staff members to ensure better support and use.

I agree to the following conditions with the understanding that I can withdraw from this study at any time without penalty.

- The information of participants will be protected. The individual participant's responses will be coded by letters (A, B, C, …) and numbers (1, 2, 3, …) to protect the confidentiality and anonymity of the participants.
- Information gathered during the course of the study will become part of the data analysis and may contribute to published reports and presentations.
- There are no foreseeable risks for participants.
- Participation in the study is completely voluntary, and there will be no penalty for nonparticipation.

Signature_____

APPENDIX F

SURVEY ADMINISTRATION

To participating principals:

Thank you for your assistance in the administration of the enclosed surveys. Information collected from the surveys will be the statistical basis for the designated research study. The focus of the study is to investigate the attitudes of administrators and teachers regarding the use of cell phones for educational purposes versus the demographic factors of age, gender, socio-economic status, professional experience, technology training, and educational roles of the participants. The research findings could be useful for school districts contemplating movement into "bring your own technology" programs.

Please complete the following steps:

1. Ask all members of your administrative and teaching staffs to participate in the survey.
2. Distribute the enclosed surveys, participant consent forms, and pencils to participants in the survey.
3. Direct participants to read carefully the individual participant consent form.
4. Explain that participation in the survey is voluntary and without penalty for nonparticipation.
5. Explain that results will be coded by letter and number to ensure confidentiality of responses and schools.
6. Request signatures on participant consent forms to indicate informed consent.
7. Request that the school secretary collect the completed surveys and consent forms and place them in the provided return envelopes.
8. Seal envelopes and place them in a locked file cabinet.
9. Notify researcher that envelopes are ready for collection. (See contact information below.)

Your support in the administration of this survey is critical to the success of this research project. If you have any questions, please contact Karen Lockhart at (404) 697-8130 or at karenllockhart@bellsouth.net.

Sincerely,

Karen S. Lockhart

SURVEY ADMINISTRATION SCRIPT

Good _____.

We have been asked to participate in a pilot research study. The research project is entitled **A Comparison of the Attitudes of Educational Administrators and Teachers on Cell Phone Use as an Educational Tool.**

Today, I will administer a survey to you for the study. The survey includes 25 items: 8 participant demographic responses, 16 Likert-like rating statements to determine the attitudes of participants, and 1 open-ended question to allow elaboration on concerns regarding the use of educational technology in the classroom.

First, I will distribute a letter to you from the researcher. The letter explains that participation in the study is anonymous and voluntary and that there will be no penalty for nonparticipation. It also clarifies that participation may be discontinued at any time without penalty or prejudice for the participants. You are asked to sign the letter to indicate your consent to participate in the study. These letters will be collected by the school secretary and placed in an envelope marked **consent letters**.

Second, I will distribute the survey to you for completion. It should take approximately 10 minutes to complete the survey. Upon completion, return the survey to the school secretary. The surveys will be placed in a second envelope marked **surveys**.

Thank you for your time. The information collected from this survey will be analyzed, providing valuable feedback for the researcher. This feedback will assist the researcher in completion of a future dissertation.

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