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## Teacher Use o One-To-One Ipads In The Classroom: Technology Integration, School Level Support, and Teacher Beliefs

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TEACHER USE OF ONE-TO-ONE IPADS IN THE CLASSROOM: TECHNOLOGY  
INTEGRATION, SCHOOL LEVEL SUPPORT, AND TEACHER BELIEFS

by

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Submitted in Partial Fulfillment of the Requirements

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## DEDICATION

This labor of love is dedicated to my mom, Agnes Barfield McCraven, who supported and loved me through this journey, but could not finish the journey with me.

Her last words to me were to remind me how proud she was of me.

## ACKNOWLEDGEMENTS

Without the support of many others, this work would not have been possible. I would like to express my deepest appreciation to Dean Lemuel Watson, who took a chance on me when I am sure he did not have time to do so. Thank you to other members of my committee: Dr. Rhonda Jeffries, Dr. Michael Grant, and Dr. Daniella Cook. I appreciate your time, your expertise, and your guidance.

I also wish to thank my family and friends for your loving support. You have been my strength and source of energy and determination.

I also wish to extend a special thanks to the teachers who kindly agreed to be a part of my study.

## ABSTRACT

The purpose of the study was to investigate teacher perceptions of the implementation of one-to-one iPad use in the classroom to include technology integration, school level support, and teacher beliefs. The study explored the beliefs, attitudes and perspectives of eight elementary school teachers. Focus group interviews, single interviews, and classroom observations were utilized to gather qualitative data for this study. In the research findings, I presented participant descriptions and analyzed the data. The major findings that emerged from this study are organized according to the themes: technology integration, school level support, and teacher beliefs. Within technology integration, the categories that emerged from the data are first order barriers, time management, classroom management issues, and learning management issues. The second theme brought forth the categories principal support, professional development, and classroom management. Within the final theme, Teacher Beliefs, the categories that emerged are pedagogy, SAMR, and high stakes testing. The findings will provide teachers, principals, and school district personnel new insights into the impact of this one-to-one implementation.

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## **CHAPTER ONE**

### **INTRODUCTION**

During the last few decades, digital technologies have become ubiquitous and have greatly influenced all aspects of most people's lives. This has happened in society as a whole, but this is also true in the classroom. Many educators and researchers are questioning how teachers are processing the saturation of new and ever-increasing technologies (Kinash, 2011). Adoption and integration of technology in teaching and learning often requires considerable and sustained effort on the part of teachers. In a recent Public Broadcast System (PBS) (2013) teacher survey about technology, only half of the teachers reported feeling comfortable enough even to experiment with new technologies. While many teachers may not be using the technology, 21<sup>st</sup>-century students feel very comfortable with technology. Prensky (2010) claims today's students "are all 'native speakers' of the digital language of computers, video games and the Internet" (p. 2). These students tend to be technologically advanced and "connected to their peers and the world in ways no generation has been before" (Prensky, 2010, p. 2). The growing realization of the differences between today's students and those of even a few years ago has led many teachers to reflect on the way they teach and to begin to try new methods and tools that are more relevant and engaging.

While technology is second nature to students, most teachers were not born into this digital world (Prensky, 2010). These teachers have the demanding task of keeping up

with new styles of learning, new program changes and new technologies. Since they need to prepare themselves and their students for these changes, teachers also benefit from various types of support to be able to keep up with these changes. A number of different types of support needed for effective integration of new instructional skills have been cited in the academic literature (e.g., administrative, technological, professional and peer) (Gülbahar, 2007). Gülbahar (2007) and other scholars (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010) make it clear that support for teachers should extend beyond professional development sessions. In ideal circumstances, professional development would also include time to experiment with the new technologies, opportunity to change the way teachers teach, and room to make mistakes.

One technological tool to enter classrooms in the last decade are tablet computers. A tablet is a mobile computer that has a completely flat surface. It can be touch screen or pen enabled. Keyboards can be added as an option, but are not contained within the unit itself. The tablet most used in education is the Apple iPad. The iPad, which first came out in 2009, has the potential to change technology in education, with students having constant access to the internet, electronic textbooks, and thousands of educational applications (apps) that are helping make the classroom more interactive for students. Apps are a software application that can be downloaded and installed on a personal electronic device. Whether students are creating videos using the *iMovie* app, creating flashcards for their next test, or watching instructional videos, the iPad has the ability to engage all students and help them learn difficult concepts (Ingraham, 2013, p. 28). The iPad's characteristics make it an appropriate tool for classroom instruction, including price, physical size, processor speed, storage capacity, Wi-Fi connectivity, mobility, built

in camera, accessibility features, and an abundance of available apps (O'Malley, Jenkins, Wesley, Donehower, Rabuck, & Lewis, 2013). Simply purchasing iPads for the classroom, however, does not guarantee effective support for student learning due to the numerous considerations for the integration of new technology into teaching and learning. This study focuses on what happens when teachers are given a classroom set of one-to-one first, iPads, where each student has their own iPad. I observed and interviewed teachers to find how they are using the iPads, what barriers and strategies they have found to learning, and how the iPads are being used in the classroom.

### **Statement of the Problem**

Although there is a proliferation of iPads in classrooms across the U.S., relatively little research exists (Chou, Block, & Jesness, 2012) that examines how they are being used, barriers, promising practices, best practices, or other issues related to their classroom use. According to Kucirkova (2014), future research needs to examine critically the potential of iPads to act as an innovative pedagogical support to current classroom practices and instructional strategies. Large amounts of monies are being invested into the purchase of iPads; however, little is known about how they are being used and how they augment learning in the classroom (Chou, Block, & Jesness, 2012).

Worldwide, according to Apple, they have sold 13 million iPads to education customers. Research reveals that teachers in many schools across the nation are integrating iPad devices in their classrooms (Hoffelder, 2014). While much research is written about integrating laptops, there is not much in the literature related to specific iPad implementation models and the device's use as an instructional tool (Eisele-Dyrli, 2011; Kinash, 2011). Since school districts are spending millions of dollars on tablets,

like iPads, the timing is optimal for pursuing research related to this topic. Research is needed to determine how classroom teachers are using the iPad as an instructional tool, what difficulties they are having with implementation, and what pedagogical techniques are being employed with the technology.

One factor in technology integration is that teachers do not have freedom in the curriculum. Brown (2014) found that with high stakes testing and teachers being judged on test scores, many teachers do not feel they have freedom to add technology. In an interview, one teacher said she worried that she may be wasting time she should be devoting to the standards. Technology is usually portrayed as the ultimate classroom tool able to revolutionize the educational system. What is not usually taken into account is that unless there is enough training and support, teachers will continue to teach using traditional instructional methods. Progressive methods of education advocate for student-centered approaches to learning which focus on individualized instruction and learning by doing, often referred to as the constructivist approach, where students construct their own knowledge (Brown, 2014).

It is clear that simply increasing computer access is not sufficient to change teachers' technology practices especially if this increased access is not accompanied by a corresponding shift in teachers' pedagogical beliefs. Ravitz, Becker, and Wong (2000) stated teachers' implementations of student-centered approaches are often limited by difficulties associated with meeting individual student needs within a large classroom, balancing multiple objectives, and responding to external forces and expectations.

## **Research Purpose**

The purpose of this study is to examine the processes, successes, barriers, instructional strategies, pedagogies, and other aspects related to the one-to-one technology integration of iPads in the classroom.

## **Research Question**

The specific question that guides the current research is: What are the challenges and opportunities of using iPads in the classroom for teachers? Within this question I am looking for technology integration, school level support, and teacher beliefs. This question adequately addresses the overall purpose of this study. The knowledge gained through the current research will contribute to the development and implementation of meaningful professional development and teacher training opportunities that directly impact technology use, not only iPads, in the classroom as a teaching tool.

## **Conceptual Framework**

The review of literature related to this phenomenon has contributed to a conceptual framework for the design and administration of this study. The conceptual framework design informed and guided the research process and has served to inform the methodological design and the development of the data-collection instruments to be used in the field. The conceptual framework also serves as a key for understanding how data will be collected and coded, and the findings and interpretations are aligned to reflect the conceptual framework.

Each of the categories in the conceptual framework reflect the research question and what I am looking for. While the research question is broad, there are specific items that are examined. The first category is technology integration. This includes the level of



use of technology in the classroom, advantages and barriers to having iPads in the classroom, including technical issues. The second category is school level support. This includes classroom management, school culture, time, professional development, and principal support. The final category is teacher beliefs. This encompasses self-efficacy, the teachers' attitudes and beliefs, professional learning communities, what effect high stakes testing has on technology use, student-centered instructional practices, and Substitution Augmentation Modification Redefinition (SAMR). SAMR is a model designed to help educators infuse technology into teaching and learning. Developed by Dr. Ruben Puentedura (2006), the model supports and enables teachers to design, develop, and infuse digital learning experiences that utilize technology. The goal is to transform learning experiences so they result in higher levels of achievement for students.

### **Significance of the Study**

In 2015, the average cost of equipping one classroom with one-to-one iPads is approximately \$15,000. One-to-one computing is a model of technology integration in which a school provides each of its students with a personal device for the duration of a specified time, such as a school year or semester. The device is available to the student around the clock and is integrated into the majority of the students' classes.

Are teachers going to use the technology when it is placed in the classroom? Or, are the teachers going to be so frustrated with technology integration that the devices collect dust in the classroom? If teachers use iPads, how effective are they in the overall learning experiences of students? The study helps educators and administrators answer these questions. Based on the results, administrators can adjust or prioritize their technology plans with more professional development. As the data support the use of technologies in

classrooms, this study could also be used as a justification of expenditures. District administrators and taxpayers may permit more funding of iPads as the data reveal that the use of such technologies is an effective and efficient way of educating students. Once decisions are made about purchasing iPads, the next question is how to use them. This study provides valuable data from teachers and students about how they negotiate the implementation of iPads and modify instructional delivery and enhance student learning with technology.

Teachers will be able to read about experiences of other teachers and students with iPads. Teachers will have a starting point for integration within their individual classrooms. A teacher's planning time is always limited. The data provide teachers with a starting point and will hopefully prevent them from spending large amounts of time trying to use the technology where it does not fit naturally. Specifically, they will have prior knowledge about how iPads work best with certain instructional strategies. Finally, educational leaders and administration can have access to valuable data from the view of teachers as to the most effective implementation and professional development models.

### **Delimitations**

This study was designed as a case study with four classrooms established as a case. Through my data analysis, I examined statements, meanings, themes, and a general description of participant responses. Through interviews with teachers, observations, and document analysis, I analyzed common themes and descriptions from my participants. The case study methodology allowed me to work with teachers for an extended time period in order to understand the essence of this phenomenon. Once my field work was completed, I began the process of analyzing the data. I consulted my research journal for

field notes on personal thoughts and ideas. I coded all interviews, observations, and document analysis in order to look for similar patterns in lessons and similar themes in responses. These responses are provided in a narrative form grouped by the individual cases or classrooms.

Research began in the fall of 2015. The setting was in four classrooms in at least two rural elementary schools in South Carolina. I gained approval of the superintendent and the principals. The teachers included in the study had to have a set of one-to-one iPads and were integrating them into their curriculum. Data were collected through interviews, observations, and document analysis. Observations were performed during regular classroom sessions. All observations were scheduled in advance to ensure that the particular lesson was one in which the teacher planned to use the iPads. Interviews were scheduled with teachers during planning periods or after school. Any documents that the students created were analyzed to ascertain the level of thinking used to create the document.

All participants were required to comply with the research guidelines of the University of South Carolina (USC) as willing participants in the study. Transcripts of interviews and focus groups were returned to participants in the study to make sure their responses were interpreted correctly. Observation notes were provided to the teachers along with a request for their feedback. Information was recorded regularly in a research journal.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **Introduction**

There are several major bodies of literature that guide the current research in the area of educational technology. For the purpose of this study, I will review the literature in four areas. The first selection of literature deals with current practice as it relates to technology integration. These studies examine the extent to which teachers use technology and some of the obstacles faced while trying to integrate the technology in their classrooms. In reviewing the literature dealing with technology integration in education, it is evident that this has been a major focal point of research since the mid-1990s. Although both students and teachers are becoming more technologically advanced, have more access to computers than ever before, and use computers more now than ever, technology use in the classroom is still treated like a special event or an add on to the traditional curriculum (Chou, 2012; Russell, Bebell, O'Dwyer, & O'Conner, 2003).

The second area of research will focus on school-level support. This research relates to the professional development teachers need for successful technology integration, skills that are needed when technology is added to the environment, and the time that must be given to integration when so much of the classroom time is required for other things, namely standardized testing. This section also focuses on the effect of the issue of time, administration and school culture.

The third area of literature review is about teachers' beliefs and its impact on their use of technology. Specifically, I focus on teachers' attitudes, confidence, and beliefs. There is much literature about the pedagogy that teachers choose to use in their classroom, specifically where technology is concerned. Pedagogy refers to the actions taken by a classroom teacher to ensure that learning takes place. Pedagogy can encompass strategies, selecting curriculum and resources, and assessment or evaluation methods. Many teachers still choose the traditional method of delivery instead of student-centered instruction, believed to be most powerful for facilitating student learning (Cuban, Kirkpatrick, & Peck; 2001; International Society for Technology in Education, 2008). Just adding a technology tool to a traditional teaching approach does not produce more effective instruction. In most of the classes today, teaching happens based on old theories of learning where technology is utilized only as an instrument in changing traditional tools. For example, teachers use PowerPoint slides in the classroom instead of writing on the board or using written texts and passing them out in the classrooms. We find that the technology is just a fancy tool replacing what we were doing before. This is where the SAMR model comes in (Puentedura, 2013). The SAMR Model is an evaluation tool of lessons using modern technologies and software with the hope of promoting 21st century skills in both staff and students. While educators alter lesson plans to accommodate available technology and software, the goal is to make the technology transform the learning process. In doing so, educators would be able to provide invaluable lessons to learners so that both the learner and teacher move beyond lower levels of technological literacy to levels which breed innovation.

Finally, my research focuses on iPads as a curriculum device in the classroom. Many schools are choosing tablets because they are a customizable mobile computer with a touch-controlled interface and an abundance of software tools (Shuler, 2009). The iPad's size fits naturally into various learning environments (Chiong & Shuler, 2010); it can be embedded into the classroom environment; and its content can be customized to meet the individual learning needs of all students (Chiong & Shuler, 2010). In addition the iPad includes desirable features, such as size, weight, ability for audio, and various ways to present text and images (Melhuish & Falloon, 2010). Then, I focus on iPads specifically in the classroom and the scant research that has been done on them and one-to-one use.

### **Technology Integration**

Most professionals of the 21<sup>st</sup> century (e.g. doctors, bankers, mechanics) use up-to-date technology to perform their jobs more effectively and efficiently, but teachers tend to teach the way they were taught, with roughly the same tools as those who came before them (Cuban et al., 2001). There are several reasons or barriers to this technology integration. In 1999, Ertmer distinguished between two types of barriers that impacted teachers' uses of technology in the classroom. First-order barriers were defined as those that were external to the teacher and included resources (both hardware and software), training, and support. Second-order barriers comprised those that were internal to the teacher and included teachers' confidence, beliefs about how students learned, as well as the perceived value of technology to the teaching/learning process (Ertmer, 1999). Historically, the literature on technology integration addresses more of the second-order technology barriers (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012;

Hew & Brush, 2007), the challenges and successes that teachers face when integrating technology into their classroom.

It is important to define technology integration for the purpose of this study.

Technology integration refers to a reliance on computer technology for regular lesson delivery (Bauer & Kenton, 2005). This also includes students' uses of technology on a regular basis to enhance the learning experience. There are several levels of technology available in the classroom to both the students and teachers. To distinguish the type of technology integration I am measuring in the current study, I am using Ertmer's (2005) concept of higher versus lower level technology, but renaming them teacher-centered versus student-centered to focus on integration of the technology for students. Lower level technology or teacher-centered is being defined as emailing, word processing, attendance, etc. These are the daily uses of technology that make the teachers' daily tasks simpler but do not necessarily impact the learning of the child. The higher level use of technology or student-centered includes all other forms of technology that are used to enhance the learning experience and involves the student in the use of the technology. Student-centered integration is a means to increase academic performance. Successful student-centered technology integration requires instructional design that links learning objectives to specific learning tasks and produces measurable outcomes (Chou, 2012).

**Technical issues.** A common frustration for teachers who attempt to teach with technology is the amount of time spent on technical issues rather than instructional ones. In the early stages of implementing technology in classrooms, teachers' concerns often center on the technology itself, and they are unable to focus on using technology in instruction until those technical needs are met (Bauer & Kenton, 2005; Kopcha, 2012).

Equipment is an obstacle mentioned by the group of teachers surveyed. Some teachers reported having issues with access to enough equipment or computers, while others talked about having access to updated resources and software. If technical and classroom management issues become too daunting, teachers often opt not to use the technology but rather stick with traditional practices. Traditional teaching methods refer to a set of instructional methods in which the teacher is the center of attention, serves as the provider or source of all knowledge, and the director of all learner activities. Even when teachers leave teacher development programs with specific plans for using technology in their classrooms, they often abandon or alter these plans when they encounter technical constraints coupled with inadequate support (Sandholtz, 2001). Given an already heavy workload and an increased focus on accountability, teachers may see little point in contending with technical issues.

According to Project Red (ISTE, 2010), over 40% of one-to-one technology integrated schools do not utilize their technology on a daily basis. Even though the majority of teachers appreciate the importance of utilizing technology in their classroom, numerous challenges can affect and hinder implementation efforts. Despite these challenges, teachers overwhelmingly feel that the utilization of technology in the classroom creates opportunities for school children to create and discover (Franklin, 2007).

**Barriers.** Implementing technology into the daily curriculum can be extremely difficult when all educators perceive are challenges and barriers (Franklin, 2007). Many of the challenges that educators perceive as explanations for not utilizing technology in their daily curriculum lessons are as follows: lack of time (Bauer & Kenton, 2005) lack



of access and proper technological equipment, school culture (Zhao, Pugh, Sheldon, & Byers, 2002; Ertmer & Ottenbreit-Leftwich, 2010), teacher abilities (Waight & Abd-El-Khalick, 2007), teacher beliefs (Ertmer, 2005) and lack of appropriate professional development (Lim & Khine, 2006; Ertmer & Ottenbreit-Leftwich, 2010).

For teachers, technology can be intimidating and frustrating (King, 2002). In a study conducted by Hooper and Rieber (1999), they identified five phases of teachers' use of technology. These phases included (1) familiarization, (2) utilization, (3) integration, (4) reorientation, and (5) evolution. The five stages are defined as: (1) Familiarization, learning the how-tos of using technology, (2) Utilization, trying the technology, but will not miss it if taken away, (3) Integration, using technology for certain tasks; designated uses, (4) Reorientation, using technology for more than delivery of content; focus is more on student learning and, (5) Evolution, continuing to evolve, adapting and integrating technology. What the researchers concluded in this study is that most teachers never succeed past the utilization stage. The goal is for the teacher to use the use technology seamlessly in their instruction. Teachers become content with their technology use at the current level and do not put much more effort into consistently increasing its use. Therefore, the utilization stage is not adequately achieved or mastered by most teachers, regardless of their familiarity with technology (Wright & Wilson, 2011). Technology use at the utilization level is common in education and often considered by teachers to be technology integration. Researchers are still using these phases to evaluate teachers' progress with technology in the classroom (Majeed & Yusoff, 2015; Wright & Wilson, 2011).

Bauer and Kenton (2005) conducted a study that investigated the prevalence of technology integration among teachers that were considered technologically savvy. Using teachers who were regarded by their schools as being highly skilled in technology, the researchers conducted a qualitative study to investigate the classroom practices used by these teachers. They conducted a survey that examined how much these teachers used technology in their curriculum, what obstacles they had to overcome, and their general issues or concerns regarding technology implementation. Bauer and Kenton (2005) concluded from their study that these teachers were highly educated and very fluent with the use of technology. They were also skilled at maneuvering around obstacles that stood in their way. Despite these strengths, these teachers did not integrate technology into their curricula on a regular basis as a tool for teaching and learning. The study found several issues reported by teachers to be obstacles to implementing technology. The major issue cited was time. Teachers stated the students simply do not have enough time for computer-related activities, and teachers do not have enough time to plan appropriate technology-integrated lessons. A shift from teacher-directed to student-centered practice requires extended periods of time (Sandholtz, Ringstaff, & Dwyer, 1997). Student skill level and teacher skill level were also major obstacles mentioned by the teachers. They reported having multiple levels of computer abilities among their students. This makes it hard to incorporate higher levels of technology without having to teach the basics. Teacher skill levels are also a factor. In many cases the teachers simply do not possess the skill level or resources needed to integrate technology effectively. In the Bauer and Kenton (2005) study, 17 % of the teachers reported their own lack of expertise as being a major barrier to technology integration. Mouza (2008) found that teachers can often feel

uncomfortable utilizing technology and are unaware of the teaching and learning pedagogies that technology and the Internet are able to support.

According to Becker (2000), computers serve as a “valuable and well-functioning instructional tool” (p. 29) 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 pedagogy. While the technology is being provided, teachers are not being adequately prepared or trained in how to use the technology in the classroom (Becker, 2001; Franklin, 2007). This research is supported by other bodies of literature (Hew & Brush, 2007; Rogers, 2000). Brush and Hew identified five major barriers that generally affect K-12 schools in their attempt to adopt educational technologies. These include resources, institutional barriers, subject culture, attitudes and beliefs, knowledge and skills, and assessments. Rogers (2000) identified very similar barriers recognized by teachers as barriers to true technology integration based on the existing literature. In both studies, the researchers relied on existing literature to identify the most common barriers cited by teachers as obstacles to technology integration.

### **Professional Development**

To use technology to support meaningful student learning, teachers need additional knowledge of the content they are required to teach, the pedagogical methods that facilitate student learning, and the specific ways in which technology can support those methods (Ertmer & Ottenbreit-Leftwich, 2010). The public and educators alike have now come to realize that just having the technology readily available does not immediately result in it being used to further education. Knowing how to use technology is not enough to enable you to use it effectively in the classroom. To use the technology effectively in

the classroom a teacher must develop plans for teaching software to students, select appropriate apps to meet the needs of the curriculum and the students, and manage the hardware and software (Coppola, 2004; King, 2002).

If we are to reach our goal of full technology integration into the curricula on a consistent basis, then we have to change the way we approach professional development and teacher training. Teachers would be well served by learning effective ways to integrate technology (Bauer & Kenton, 2005). Helping teachers effectively incorporate technology into the teaching and learning process is one of the most important goals in educational technology.

Proper professional development is critical for successful implementation of technology into the classroom. According to the International Society for Technology in Education (ISTE) (2010), with excellent staff training opportunities and a fresh pedagogy, amazing things happen, but just handing out the digital technology is not going to provide success. The report explained that in one-to-one initiatives a strong, ongoing professional development program has to be developed, and that the professional development for teachers and administrators needs to go much deeper than just simply learning how to utilize the technology. The report added that year-round job-embedded professional development programs are most successful when campus instructional technology specialists are in place to support professional learning communities amongst the faculty (ISTE, 2010). The idea that professional development must be an ongoing planned activity in order to truly encourage lasting change in education is one that has been embedded in the research (Ertmer & Ottenbreit-Leftwich, 2010; Slavit, Sawyer, & Curley, 2003). Effective professional development must start with what the teacher

already knows and move them forward in small, incremental steps (Ertmer & Ottenbreit-Leftwich, 2010).

### **School Level Support**

Another barrier for teachers and schools cited often in the research is lack of administrative support. Speak Up (2010) presented their national findings related to 35 educators' use of educational technology in May 2010. The focal point of the article was to examine the perceptions regarding emerging technologies by teachers, future teachers, and administrators. This research is important to the current study because it emphasizes the role that administrators play in the full implementation of technology throughout the school. Administrators acknowledge the need for higher levels of technology and availability for all students. Teachers are reporting that they are using technology more frequently than in recent reports. This is up a great deal compared to the 2008 study conducted by the same researchers. Although more teachers are reporting using digital media, its potentials are still not being maximized. Principals can be viewed as "the main actors in the institutional promotion of innovative use of technology in their school and should encourage teachers to use technology in their instructional practices" (Blignaut, Hinostroza, Els, & Brun, 2010, p. 1560). These leaders can help set the tone for how technology is embraced throughout the school. In general, in-service teachers' beliefs and practices shift to align with the current school culture in which they are working (Zhao & Frank, 2003). Therefore, school leadership is a critical factor in facilitating teacher change. One of the primary roles of school leadership is to support teachers and create a shared vision for technology use.

According to Dawson and Rakes (2003), the more technology training the principals had, the more technology was implemented in the curriculum. Another interesting conclusion from this study was that the age of the administrator did significantly influence technology integration throughout the school. These differences were attributed to leadership styles rather than years of experience. School administrators may not have the overall skills and knowledge to fully assist educators (Sharratt, 1999). Sharratt revealed that district or central office and campus level leaders are not fully equipped with the technological knowledge required to determine critical decisions surrounding technology that they encounter on a daily basis.

Principals' vision and motivation can significantly influence the success of technology in the classroom (Sharratt, 1999; Somekh, 2008). According to Lim and Khine (2006), school leaders and administrators can either delay or inhibit technological implementation, or may not even acknowledge the need for technological development without the initial approval and efforts of the teachers. It was found that individual's beliefs and attitudes can be greater indicators of success than that of knowledge when executing decisions (Sugar, Crawley, & Fine, 2005). Teachers need educational leaders and school administrators to support teacher collaboration and to assist with increased teacher technology integration in the classroom (Luft, 2008). This can be accomplished through the encouragement of attending and offering workshops for teachers' professional development, making purchasing decisions about new technological tools, spearheading school-wide initiatives around technology use, and establishing partnerships with universities and businesses.

Teacher beliefs have been shown to be heavily influenced by the subject and school culture in which they participate. “Teachers are not ‘free agents’ and their use of technology for teaching and learning depends on the interlocking cultural, social, and organizational contexts in which they live and work” (Somekh, 2008, p. 450). And, unfortunately, for most, the culture to which they must conform has not adopted a definition of effective teaching that includes the notion of technology as an important tool for facilitating student learning.

### **Teacher Beliefs**

Further review of the literature revealed that a significant amount of research regarding technology integration is aimed at investigating the effects that teacher beliefs have on the implementation of technology. This line of research is important to my study because it emphasizes the role that personal and philosophical beliefs play in the emergence of technology integration. It is also important as it reveals the challenges that schools face if they are to move towards true technology integration. If we want to see technology used more as a tool by teachers to enhance the learning process then we have to transform the way teachers think about technology use. Kagan (1992), Pajares, (1992), and Ertmer (2010) suggest that teacher beliefs have more influence on practice than knowledge does. According to Nespor (1987) beliefs and experience are closely related. Professional development and training have to be designed in a way that exposes teachers to the various uses of technology and software available. In order for teachers to use technology on a consistent basis they must achieve a level of comfort in using it that drastically changes how they feel about its use. This will lead to changes in beliefs. Consistent exposure, technology support, and ongoing training are the key factors to

ensuring teachers will maximize the use of technology in their curricula (Brinkerhoff, 2006). The more valuable a teacher judges the technology, the more likely they are to use it (Ertmer & Ottenbreit-Leftwich, 2010).

Alboin and Ertmer (2002) believe that changing teaching style that is required to integrate technology fully may require changes to teachers' beliefs. Their study found the personal philosophical beliefs of teachers are not easily changed and deserve being acknowledged as a critical influence on the successful integration of technology. Their article supports the notion that teachers with a more constructivist outlook are more likely to use and implement technology as a tool.

Vannatta and Fordham (2004) examined teacher dispositions as predictors of classroom technology use. According to Vannatta and Fordham, the best predictor combinations of classroom technology use include amount of technology training, time invested beyond the work week, and openness to change. This research indicates that regardless of the amount of technology training offered, a teacher's devotion to technology beyond the school environment has a great impact on his or her use of technology in the classroom. Openness to change was another important factor noted by the researchers. They noted that despite teaching philosophies, a teacher's willingness to accept change and learn new things greatly contributed to his or her frequency of technology use.

Koszalka (2001) explained that an educator's mental state of readiness to adapt to change and innovative strategies to utilize technology can be a large factor in determining if an educator will integrate technology in the classroom. Sugar (2005) found that educators' attitudes and beliefs in relation to utilizing information and technological



communications in their individual classrooms are a key factor in determining and facilitating positive and successful implementation of technology. According to Sugar (2005), it is critical that there is a positive attitude on behalf of teachers towards the integration of technology in the learning process, in order to have efficient technology integration. Sugar (2005) also added that teachers' positive beliefs towards technology will make the learning process easier for both student and teacher, and that assessing the attitudes of educators surrounding recent technology would assist with any negative thoughts about technology integration that might occur during critical transition phases.

Many have suggested that these belief systems influence how teachers use technology in the classroom (Angers & Machtmes, 2005; Hermans, Tondeur, van Braak, & Valcke, 2008; Windschitl & Sahl, 2002). In general, teachers with more traditional beliefs will implement more traditional or "low-level" technology uses, whereas teachers with more constructivist beliefs will implement more student-centered or "high-level" technology uses (Judson, 2006; Roehrig Kruse, & Kern, 2007). Hermans and his colleagues noted "traditional beliefs had a negative impact on integrated use of computers" (p. 1499).

In a survey of 764 teachers, Wozney, Venkatesh, and Abrami (2006) found that one of the two greatest predictors of teachers' technology use was their confidence that they could achieve instructional goals using technology. This suggests that time and effort should be devoted to increasing teachers' confidence in using technology, not just to accomplish administrative and communicative tasks, but to achieve student learning objectives. In fact, evidence suggests that confidence may be *more important* than skills

and knowledge among teachers who implement technology in their classrooms (Ertmer & Ottenbreit-Leftwich, 2010).

To increase teachers' confidence is to help teachers gain personal experiences that are successful. A number of suggestions for building teachers' confidence with technology are in the literature: They include giving teachers time to play with the technology (Somekh, 2008), starting with small successful experiences (Ottenbreit-Leftwich, 2007), working with knowledgeable peers (Ertmer, Ottenbreit-Leftwich, & York, 2006), participating in a professional learning community (Putnam & Borko, 2000), and situating professional development programs within the context of teachers' ongoing work (Cole, Simkins, & Penul, 2002; Snoeyink & Ertmer, 2001/2002).

### **Student-Centered**

Educational reform efforts have consistently purported student-centered practices as the most effective way to prepare our students for the 21<sup>st</sup> century (Voogt, 2008). Use of technology ignites a sense of ownership in the learner, therefore giving them the control. As stated by Jenkins (1999), in a technology-enriched classroom the teacher no longer controls what happens and loses the monopoly of the authority. The teacher then becomes leader, helper, partner, and evaluator. The role of the teacher is dramatically changed in the technology-enhanced classroom. In this capacity, the teacher plays a more managerial role where he/she manages the groups and ensures cooperation and active engagement. This is different from the more traditional role where the teacher is the center of the learning process. Student-centered education involves the student in the learning process and makes the learning more individualized. One of the major advantages of technology integration in education is that it is student centered, and the learner has control over

many aspects of his or her own learning. Technology integration also puts the responsibility of learning directly on the student. This student-centered approach to teaching and learning gives the student a dominant role in their education process. This helps to boost the self-esteem of the student and gives them a sense of power (Jenkins, 1999). The student is an active participant that is engaged in the learning process as opposed to sitting and listening to information. The teacher is no longer the center of instruction and now serves a different role of facilitator.

The creation of digital classrooms and the implementation of a student-centered learning approach have placed new demands on teachers to transform their pedagogical practices. In the new learning environment, teachers are expected to be facilitators who monitor students' learning processes and provide them with timely support. Learners control their own learning flow, not only in class but also out of class. This is different from the teacher-centered paradigm in which a teacher's role is to transmit knowledge in traditional classrooms. Research on technology-supported innovations reveals that implementing student-centered instructional practices is challenging for teachers for various reasons (Garrett, 2008). One major issue concerns teachers' lack of pedagogical competence in implementing technology-supported innovative practices. A new teacher development model is required to build teachers' competence in and acceptance of innovative practices. It is critical for teachers to understand the difference between using a technology as a passive tool to teach and using technology as an interactive tool that helps solidify students' learning. A passive tool to teach would include a teacher showing a PowerPoint presentation. This is teacher centered. A more interactive student-centered

use would be students researching, on their own, George Washington and creating an iMovie about his place in the American Revolution.

Teachers may also experience pressure to use instructional technology in ways that are not especially student-centered, given the increasingly important role that high-stakes testing plays in US education; some fear that time devoted to test preparation using skill-and-drill software packages and “canned” online resources may threaten the opportunities for rich and authentic constructivist approaches (Overbay, Patterson, Vasu, & Grable, 2010). At the same time, the perceived need to “teach to the test” poses a potential challenge to teachers who wish to engage in student-centered practice, a challenge that may be compounded by the pressure to incorporate unfamiliar classroom technologies in their instruction (Becker & Riel, 1999). This discovery suggests that encouraging the use of instructional technology in the classroom may hinge upon helping teachers see how it can be used to construct knowledge in meaningful ways.

There is a close relationship between technologies and student-centered learning, the implementation of each one benefiting the other. As Judson (2006) reported in his paper, there is a relation between teachers who use student-centered teaching methodology and technology utilization in the classroom. According to Judson, student-centered teachers tend to use technology in their classrooms and incorporate technology to their courses more frequently than the teachers who follow other learning doctrines. With the rapidly changing landscape of the K-12 classroom, asking questions about the relationship between student-centered practice and the use of classroom technologies seems more important than ever.

## **SAMR**

Teachers still struggle to integrate technology in the classroom. This is because, to do so, teachers need two skill sets aside from a background in and knowledge of the content they are teaching: 1) basic technology skills and comfort with tech tools, and 2) pedagogical practice aligned with meaningful, student-centered learning (Brush & Saye 2009; Kopcha 2010). Consequently, no matter how much technology training and how many resources we provide, without a corresponding and overarching emphasis on pedagogy, the training and resources have little to no impact on teachers' technology practice and on the interactions with technology their students experience.

SAMR, which stands for substitution, augmentation, modification, and redefinition, is a technology model developed by Dr. Ruben Puentedura in 2006. It is a basic grid that attempts to define different levels of technology tools and their use in the classroom. SAMR is an extremely popular model because it is clean and simple, which means it can be easily adapted and interpreted in multiple ways. It implies a hierarchy behind technology use, giving us a "goal" to shoot for that is quickly explained to an administrator or to an evaluator. The model makes the teacher think about how the students can be increasingly challenged to use technology in deep and meaningful ways that support higher-order thinking (Marcovitz & Janiszewski, 2015).

For the content part of the professional development, the SAMR model aims at transforming learning with technology. At the basic levels, technology can be used to substitute print text and augment traditional face-to-face learning. At higher levels, the use of technology should aim at transforming the learning experiences through modification and redefinition.

The SAMR Model consists of the following four classifications of technology use for learning activities: Substitution-The technology provides a substitute for other learning activities without functional change. Augmentation-The technology provides a substitute for other learning activities but with functional improvements. Modification-The technology allows the learning activity to be redesigned. Redefinition-The technology allows for the creation of tasks that could not have been done without the use of the technology. Learning activities that fall within the substitution and augmentation classifications are said to enhance learning, while learning activities that fall within the modification and redefinition classifications are said to transform learning (Puentedura, 2013).

### **iPads in Schools**

**History.** The Apple iPad device, a mobile device or tablet computer, is one of the most popular devices due to its accessible features, numerous apps that are available for download, mobility features, and the multi-touch display. The first version of the iPad was unveiled on January 27, 2010, after the introduction of the iPhone and iPod Touch. In order to introduce the iPad, Steve Jobs, founder of Apple, displayed a laptop and an iPhone with a question mark between, asking, “The question is, is there room in between” (Isaacson, 2011, p. 490). The iPad is considered a better option than a laptop computer because of its mobility and touch-screen features as well as the numerous apps that are available. The iPad was not available to the public until April of 2010 and in less than one month, Apple sold one million iPads (Isaacson, 2011). The author of Steve Jobs’ biography quotes *Forbes Magazine* author Michael Noer, “Steve Jobs has designed a powerful computer that an illiterate six-year-old can use without instructions...if that

isn't magical, I don't know what is" (Isaacson, 2011, p. 498). Even the few research studies that have been conducted on the use of iPads in the classroom have provided evidence that an advantage to using these devices in the classroom is that teachers do not have to give students instruction on how to use them.

The second version of the iPad was released in February 2011; the added features to this version were the camera and audio communication. The new design was one-third lighter than the first iPad, thinner, faster, and included two cameras (front-facing for social interaction and photos and rear-facing to capture videos). Within just three days of its release, between 400,000 and 600,000 iPad 2 versions were sold and waiting lists were backed up for 4 to 6 weeks (Muller & Pope, 2011).

One year later, on March 7, 2012, the Third Generation iPad was introduced. It was even faster than the second iPad, produced sharper images on the screen, and the camera was improved (The Associated Press, 2013). Seven months later, the Fourth Generation iPad was released with a retina display and the iPad Mini (7.9 inch screen vs. 9.7 inch screen) were introduced (The Associated Press, 2013). As of 2014, Apple states that over 225,000,000 iPads have been sold.

The unique features of mobile devices, in particular of the iPad, create interesting possibilities for educational uses. Researchers report that important features include user control over goals; ownership; fun; low cost; mobility; touch controls; long battery life; availability of useful and inexpensive applications; motion and speed sensors; and remote control of classroom computers (Jones & Issroff, 2007; Marmarelli & Ringle, 2011). Apps, mobile device applications, are also important because most do not require a

constant internet connection, launch faster than software on PCs and provide simplicity, instant gratification and relatively cheap alternatives to expensive software.

When reviewing the literature, many indicated that the implementation of the iPad has the potential to offer access to effective and efficient pedagogy. For example, Bennett (2011) stated that iPads are able to deliver content in an interactive way and offer access to the web and instructional material. Others suggested that iPads can “provide an added advantage over printed texts, as they provide further opportunities for students to physically interact with and manipulate texts and to transform texts to meet their needs and interests” (Hutchison, Beschoner, & Schmidt-Crawford, 2012, p. 17).

Foote (2012) also noted that iPad integration also appears to increase overall student engagement and motivation in the classroom. Manuguerra (2011) argued the iPad mobile device has been utilized as a strategy to motivate and actively engage children with higher-level curriculum and interactive strategies, making the learning experience uncomplicated and yet meaningful at the same time. Manuguerra (2011) also reported that students seem to enjoy working on the iPad and complete their work more on the iPads, as opposed to the traditional pen and paper methods. The whole initiative appears to be a way to free students from the pen and paper monotony and put information and motivation at their fingertips.

It is clear that these handheld devices have not only become part of our daily lives but are likely to stay with us and in our schools for a long time. Many educators are enthusiastic about the use of iPads in education; they rave about their versatility, connectivity, mobility as well as the potential benefits of thousands of educational apps. However, there has not been consensus among educators regarding the benefits of these



devices in education; some educators remain skeptical, wary that the iPad may become the center of the classroom instead of being used as a tool for learning (Hu, 2011). Nonetheless, in this mixed atmosphere of anticipation and skepticism, the number of American colleges and K-12 schools that have launched iPad pilot studies or/and adopted one-to-one iPad initiatives is on the rise (Diemer, Fernandez & Streepey, 2012; Hu, 2011).

**iPads in the classroom.** While there are research studies which have yielded inconclusive results of the impact of the use of iPads in education (Falloon, 2013), through a review of the literature, Clark and Luckin (2013) reported that studies have “overwhelmingly” reported that “tablet devices have a positive impact on students’ engagement with learning” (p. 4). Similarly Diemer et al. (2012), found that the use of iPads in the classroom increased students’ perception of their engagement and in turn left a positive effect on students’ active and collaborative learning. In another study, Hargis, Cavanaugh, Kamali and Soto (2014) reported that students who used iPads gained empowerment as they became researchers and more independent learners. Swan, van Hooft, Kratcoski and Schenker (2007) investigated the effect of the use of technology including handheld devices on student learning in one-to-one computing classes. Their results showed increased student motivation and engagement in comparison with students who attended regular classrooms. They also found that teaching and learning in the computing classes were more “student-centered, collaborative, project-oriented, student-centered, and flexible” (p. 509). iPads have also been suggested to be useful for students with cognitive impairments (Conley, 2012), for promoting reading fluency (Thoermer & Williams, 2012), for assisting early struggling readers (Burnside & Muilenburg, 2012),

and for teaching content areas (Berson, Berson, & Manfra, 2012; Heinrich, 2012; Liu, 2013).

**Applications or apps.** According to Benton (2012), one of the reasons why the iPad has become so popular in education is the apps that are available for the devices. Applications or apps are the programs that can be downloaded wirelessly or by connecting the device to a computer. Some apps are free and others range in price, averaging \$1-\$5 (Hutchison et al., 2012). These devices and applications are being integrated into the classroom; however, there exists very little research on how these devices are being used in the classroom. A few studies have been completed that have given a glimpse into the use of these devices in the elementary classroom (Hutchison et al., 2012; Ingraham, 2013; Mallette & Barone, 2014). Many of the researchers are suggesting that the applications as well as the device are being used as tools to enhance the classroom as well as to scaffold students' learning (Chiong, 2011; Sevilla, 2011).

Heinrich (2012) points out that, "a device is only as useful as the tools or apps that it uses" (p. 9). Browsing the iTunes store looking for apps can become overwhelming for any teacher, with the number of apps available today. In addition, a teacher can quickly try free apps, but to have full access, cost is often involved. Purchasing numerous apps can be expensive and time-consuming and, most importantly, may not produce an outcome of acquiring tools that are well aligned with content or easy for students to use.

Hutchison et al. (2012) were some of the first to conduct a study to analyze how a fourth-grade teacher was using the iPad and applications as a tool to enhance the learning of students, as well as to provide students with opportunities to learn new literacy skills associated with the 21st century technologies. The findings suggest a few advantages and

disadvantages to using the iPad. One of the advantages of using the iPad was the students did not need prior instruction from the teacher on how to use the iPad because they have experience using these devices. Chiong (2011) concurs, reiterating that an advantage of using the iPad in the classroom is the limited amount of training the students need to utilize the device. When problems occurred, students worked collaboratively to figure out how to navigate the iPad. The second advantage was teachers could easily find an application to meet the needs of all learners and differentiate the learning environment. The third advantage was that the iPad supported time-management incentives as it could easily power on and off; therefore, instructional time was not lost waiting for a computer to boot. The fourth advantage that was found was that the iPad supported English Language Learners (ELL) students because it could be displayed in many different languages.

Along with the iPad's potential comes certain challenges that must be addressed. Disadvantages include the potential for distraction or unethical behavior and data privacy issues. With instant access to the internet, there need to be safeguards for children. Physical aspects of mobile technologies that may prevent an optimal learning experience include restricted text entry, small screen size, and limited battery life (Chiong, 2011). These devices are also somewhat fragile. Relatively expensive cases need to be put on the iPads to prevent screen shattering.

## **Conclusion**

Like the radio, all new technological tools experience their share of criticism, but mobile devices, like the iPad, have been embraced, adopted, and supported by many educators who want to provide their students with the 21<sup>st</sup> century skills that will be

needed in what will most definitely be a very technical future. The review of related literature has informed my understanding in regards to the plethora of information about technology integration that have begun in classrooms across this nation and beyond. Not only are schools struggling to fund new technology initiatives, they are also making decisions regarding accessibility to the devices and classroom integration approaches. Teachers, who seem to embrace technology and contend that it plays a vital role in the classroom, are attempting to provide opportunities to students that will advance their existing curriculum, but are not necessarily changing their pedagogical behaviors or instructional strategies in the process. Student experiences remain consistent with those found in traditional classrooms, where new technologies are not available. Although research is limited on the impact that the iPad will or will not have on education, this study serves to increase our understanding of technology integration and its barriers, school and administrative support, teacher pedagogical decisions and experiences occurring in classrooms where the devices are being implemented. This research will be accessible to educators interested in iPad initiatives and to educators seeking methods of implementation using various models. Insight into what is happening in the classroom when each student has their own iPad will also be available to inform new adoptions of mobile devices in schools.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **Introduction**

The purpose of Chapter Three is to explain the design of this study. First, I present the rationale for using the qualitative design and explain why I selected the case study model. Then, I describe a detailed plan for data collection techniques and explain how and why the particular site and participants were selected. Next, I discuss procedures for recording and analyzing data in order to present the experiences of the participants in the narrative form. Finally, I discuss my role in the process along with my subjectivity and positionality.

#### **Rationale**

The primary purpose of research according to Merriam (2009), “is to know more about a phenomenon” (p. 3). Creswell (2007) states that the goal of research, “is to rely as much as possible on the participants’ views of the situation” (p. 20). According to these two definitions of research, a researcher finds out as much as he or she can about a phenomenon through the people that are a part of it. Ideas are formed through interactions with others. Creswell (2007) states research is making sense of the meanings that others have about the world. Qualitative research specifically is “interested in understanding how people interpret their experiences, how they construct their worlds and what meaning they attribute to their experiences” (Merriam, 2009, p. 5). In qualitative research the researcher is more interested in process, meaning, and

understanding through words and pictures instead of numbers. This should happen in a natural setting with no variables being manipulated, only observed and analyzed. The purpose is to explore human behavior and try to understand how individuals make sense of their everyday lives. The researcher may also be trying to understand, and then later explain, the perspective of an individual or group (Merriam, 2009).

The major characteristics of qualitative research are summarized by major researchers such as Glesne (2006) and Merriam (2002). They are the assumption that reality is socially constructed and that there is no single, observable reality. Rather, there are multiple realities, or interpretations, of a single event. Researchers do not find knowledge, they construct it (Merriam, 2009). He or she seeks to understand a phenomenon from the perspective of the participants. The researcher is the primary instrument for data collection and analysis. The study design focuses on in-depth, long-term interaction with participants and one or more sites. These descriptions can come from people's own written or spoken words, observable behavior, documents, field notes, interviews, artifacts, and excerpts from video or audiotapes. These descriptions should include the voices of the participants being studied. The researcher should use rich descriptions about what they learned. The research should be mostly concerned with process, rather than outcomes or products (Merriam, 2009).

As I studied the characteristics of qualitative research, it seemed a logical choice for this study. As a researcher, I have constructed multiple meanings about the use of technology and the desire to know others' voices and perspectives about using technology in their classrooms. I would like to study technology, not in isolation, but how

it is used in the classroom and pedagogically. A deep, sustained interaction with participants which produces rich descriptive data seems like a perfect approach.

Creswell (2009) explains: “Qualitative research is exploratory and is useful when the researcher does not know the important variables to examine” (p.18). This fits my study because I did not know exactly which themes or categories to analyze until I observed the phenomenon first. Creswell describes the emergent design of qualitative research in the following statement: “This means the initial plan for research cannot be tightly prescribed, and all phases of the process may change or shift after the researcher enters the field and begins to collect data” (Creswell, 2009, p. 176).

### **Research Design**

To address the research questions for this study, I used case study methodology. A case study is a process or record of research in which detailed consideration is given to the development of a particular person, group, or situation over a period of time (Ormrod, 2010). The single most defining characteristic of a case study is that it limits the object of study or the case. According to Creswell (1998), case studies allow researchers to develop an in-depth analysis of a single or multiple cases. One particular program or set of teachers can make up a case. My research design is qualitative as the study aimed to gain an in-depth understanding of how elementary school teachers at multiple sites perceive technology integration in their classrooms.

My study triangulated its examination of the effects of the technology integration by employing three methods of data collection: focus groups, observations, and interviews. These data-gathering approaches allowed me to examine more deeply the experiences of teachers as they implemented iPads in their respective classrooms.

Focusing on a small number of classrooms allowed me to look in depth at their classroom management with the technology, lesson development, and pedagogy. The case study method also allowed me to look deeply into the uses of the technology in the classroom and how they affect teaching and learning.

Another way I triangulated the results is by having member checks. Creswell (2012) says, “Member checking is a process in which the researcher asks one or more participants in the study to check the accuracy of the account” (p. 259). Asking the participant to read back over his or her statements gives him or her a chance to see if he or she said what was intended or to add anything else. This also helped to take away some anxiety of the participant. It can be challenging letting someone come into your space and write down everything you say.

Another strategy I used is keeping good field notes. According to Merriam (2009), “Reflective field notes can include the researcher’s feelings, reactions, hunches, initial interpretations, speculations, and working hypothesis” (p. 131). My field notes included not only what I observe, but my feelings and reactions to my observation so that I could go back and make sure that I was capturing the teachers’ perceptions and representing them in the most accurate way possible. I had a strong desire to make this study about the stories of the participants and not about my opinions. I monitored myself to make sure that I was making this research about the teachers and technology from this school and not about me. I spent three months observing and interviewing at schools located in a rural public school district of South Carolina. The three-month observation and interview period is congruent with case study methodology and gave me a better sense as to what is happening in the classrooms. Written permission to complete the



research was obtained by the district superintendent and building level administrators at each school.

### **Research Site**

First it was important for me to find a site that fits certain criteria. The district needed to have a least some classrooms that have one-to-one integration. The school district I chose is currently piloting a one-to-one iPad initiative and intends to extend this district-wide by 2018. By 2016 they hope to have one iPad for every three students, and by 2017 one iPad for every two students while also having approximately ten elementary classrooms district wide that are already one-to-one. The district is located in a rural public school district with 20 schools (4 high, 3 middle, and 13 elementary) located in the Pee Dee region of South Carolina. The district is interested in examining the impact of the technology on their teachers' instruction, the teachers' perceptions of iPad use in their classrooms, and they welcomed the proposed study. The district's enrollment is approximately 22,000 pupils, with a poverty rate of 81% according to the 2013 State Report Card. The district's student population is comprised primarily of 49% black students, 49% white students, with a small numbers of Latino, Native American, and other ethnic groups enrolled. The district has been nominated and selected for a number of awards in recent years related to student academic performance, such as highest graduation rate in the state, fourth lowest dropout rate in the state (refers to a student quitting school before he or she graduates), and sixth among other districts in the state in terms of academic achievement according to standardized tests (South Carolina Education Department, 2013).

My sites were three elementary schools, where the participants were located, in the same district. I decided to use three schools to account for different administration styles. Also, since I observed teachers' beliefs and attitudes and since these beliefs and attitudes can be influenced by the people they are around, it was helpful for the teachers to be at different schools.

### **Participant Selection**

In choosing my site, I used purposeful criterion sampling. In order to pick an information-rich case that I can learn the most from, I selected a district that is employing a one-to-one technology program with iPads. First, I obtained a list of elementary teachers in the district using one-to-one integration from the district level Technology Director. I invited each teacher to a live focus group session. The focus group represented five different elementary schools from around the district (Table 3.1). From this focus group, I picked four participants for observations and interviews (Table 3.2). I picked the four teachers through typical case sampling. "A typical sample would be one that is selected because it reflects the average person, situation, or instance of the phenomenon of interest" (Merriam, 2009, p. 78). I also wanted to make sure they were from at least two different schools to factor in the school's culture and leadership. Participants were chosen based on grade levels that were similar.

### **Data Sources**

Data were collected in the following ways: focus group, observations, and individual interviews. First, the focus group interview was identified with help from the District Level Technology Director. The focus group interview was videotaped and then transcribed. After transcribing the transcripts were sent back to the participants to see if

there was anything they wanted to add or clarify. Following the focus group, four typical teachers from three different schools were asked to participate. Classroom observations of each participant were scheduled. Last, interviews were held with each participant.

**Focus groups.** The first type of data collection was teacher focus groups. Creswell (2012), states that a focus group is an interview with a small group of people. Patton (2002) explains:

Unlike a series of one-on-one interviews, in a focus group participants get to hear each other's responses and to make additional comments beyond their own original responses as they hear what other people have to say. However, participants need not agree with each other or reach any kind of consensus. Nor is it necessary for people to disagree. The object is to get high-quality data in a social context where people can consider their own views in the context of the views of others (p. 386).

I asked a small number of open-ended questions to the group and elicited responses and discussion among the group. The purpose of these groups was to obtain the teachers' perspectives of the one-to-one integration. The questions were general questions about using technology in their classrooms so that discussion among the participants would take place. These were semi-structured so that I could change the questions or add other questions as the need arose. See Appendix A for sample questions. Ten teachers were invited and eight showed up to the afterschool focus group. After transcribing the focus group, these were sent back to the participants for member checks.

**Observations.** The second primary method for collecting data was through classroom observations. Although humans are natural observers of their environments, observation as a tool still proves to be a difficult task for many qualitative researchers. According to Shank (2006):

There are basically three reasons why some researchers struggle to observe effectively: (1) humans are geared toward maintaining a perceptual understanding of their surroundings, frequently failing to take note of normal activities that might provide insight into the lived experiences of our participants, (2) observation can be “intense and is usually very taxing” requiring the researcher to pay attention to both normal and abnormal behaviors and environmental factors, and (3) researchers must be able to focus their observations both convergently and divergently, to ensure that all aspects of their surroundings are noted ( p. 24).

Although a difficult task for some, observation is necessary in many qualitative studies because it is the only method that allows the researcher to witness first-hand the lived experiences of the participants. Through the act of observing, the researcher “learns about actions and infers the meanings those actions have for participants” (Rossman & Rallis, 2003, p. 195). Observations, then allow the researcher to view the phenomenon from either an insider’s or outsider’s perspective, to identify patterns in behaviors and emotions, as well as relationships among participants.

Merriam (2002) describes observations and interviews as the primary source of data in qualitative research. With regard to observations, Merriam (2002) states: “First,

observations take place in the natural field instead of a location designated for the purpose of interviewing” (p.94). I observed each of the classrooms at least three times. I feel this natural setting gave me a better sense of the classroom, the teacher, and the technology integration. The observation times were scheduled with each teacher at a time that they were using the iPads in the classroom. The length of each observation was as long as the lesson. As this was an elementary school this varied from 40 to 90 minutes according to which subject they were integrating with technology that day.

During the observations, I observed and wrote field notes that documented the classroom setting, experiences provided to the students, the teachers’ strategies for implementation, and the interactions that took place between students and between teachers and students. Participants were expected to behave as naturalistically as possible while I was present in the classroom. The teachers usually had a small table or desk for me at the back or side of the room so that I would be out of the way. The observation protocol is listed in Appendix B. I began to review and code the data immediately following each observation.

**Interviews.** The purpose of interviewing is to capture background information, clarify observation data, and gather information not observed to help address the research question. For a qualitative study, “the process of collecting information involves primarily in-depth interviews” (Creswell, 2007, p. 131). Through the collection of jottings and field notes taken from observations and transcriptions compiled after in-depth conversations and interviews, qualitative researchers are able to begin to generate preliminary analyses (Roulston, 2010; Emerson, Fretz, & Shaw, 1995). These data were further analyzed, examined, and synthesized into meaningful themes and categories to

advance the understanding and interpret the meaning of phenomena in terms of the meanings that the people involved give to them. The ultimate goal, then, is to facilitate human understanding and learning.

Teacher interviews were held for approximately one hour. This gave the teacher a chance to explain what happened from their perspective. Knowing the students and being with them each day gives the teacher a different lens than mine. Data were collected via semi-structured interviews, which Fontana and Frey (2000) described as “one of the most powerful ways in which we try to understand our fellow human beings” (p. 645). These interviews were scheduled after the observations. I had some open-ended questions for each interviewee, but allowed for more flexibility if the need arose. Interviews were conducted during their planning period or after school, whichever was convenient for the participants. All interviews were recorded.

I conducted the in-depth interviews using the attached interview protocol (See Appendix C) that was aligned to the study’s purpose, but deviated when necessary to elicit additional data that might advance the research or to probe for deeper responses and more detailed information. Participants were encouraged to speak freely during the interviews. I immediately began to transcribe the interviews and code the transcriptions using appropriate qualitative procedures.

### **Data Analysis**

The characteristics of a good qualitative study include rigorous data collection procedures and the analysis of data using multiple levels of abstraction (Cresswell, 2007). Because large amounts of narrative data were collected and analyzed throughout the research, organization, abstraction, and synthesis are the most time consuming, detailed,

and tedious steps in the study. It is imperative that qualitative researchers develop an organizational framework for identifying the patterns and themes that emerge from the data.

After transcribing, in order to analyze the focus groups and individual interviews, each question was placed in a table in a Word document. I made a table for each question and copied each participant's answer and pasted it under the corresponding question. I looked through one question at a time and looked for patterns. Any words or phrases that seemed to repeat were highlighted and codes were established to identify the pattern (See Figures 1 and 2). I then reviewed observations and field notes to see if the pattern continued. For example, for the question "How do you feel your principal has supported you with the iPad?" each interviewee used the word supportive or encouraging. When looking back at my field notes I found instances where the principal had supported the teachers financially and with personnel.

After coding the interviews and observations, I looked for more patterns within the answers, and eliminated extraneous information. Each pattern seemed to fit the theme of the subheadings of my research question: technology integration, school level support, and teacher beliefs. After revisiting all of the collected data and field notes these themes became the framework for writing up my data analysis. I used specific quotations from the teachers or the observations that illustrated these themes. I revisited the data several times during analysis and contacted the teachers when I had a question that needed clarifying from the observation or interview. Upon completion of the analysis, synthesis, and writing stages, I reviewed the study with educators as the intended audience, and with the school district administration and participants.

## **Subjectivity and Positionality**

The nature of qualitative research sets the researcher as the data collection instrument. It is reasonable to expect that the researcher's beliefs, political stance, cultural background (gender, race, class, socioeconomic status, educational background) are important variables that may affect the research process. According to Merriam (2009), "Investigators need to explain their biases, dispositions, and assumptions regarding the research to be undertaken (p. 219). Such a clarification allows the reader to better understand how the individual researcher might have arrived at the particular interpretation of the data.

In reflecting on my own positionality, I find that I position myself and am positioned in various contexts. I am a mother, wife, professor, and former elementary school teacher. I come from a white middle class, Protestant background. While I am working on my doctoral studies I am the first in my family to go to college, and I am still the only college graduate in my extended family. By using positionality, I also understand that I am not only defined by these roles. I have life experiences, beliefs, and historical contexts that also factor into my positionality. Understanding positionality is crucial to understanding the subjectivity of researchers. In terms of my research, I see subjectivity and positionality as related yet different. Subjectivity, as I define it, refers to the life experiences that researchers have had as well as the social, cultural, and political factors that influence an individual and how those experiences and factors contribute to biases and assumptions in the type of research that researchers choose to engage in. Subjectivity influences how researchers conduct, analyze and interpret their research. All of these my experiences are part of me and no doubt have an influence on the way I see



everything. To monitor my subjectivity throughout the research process, I tried to remain conscious of them at all times and be reflective about how they might be interacting with my research.

I am an experienced educator. I taught 22 years in several public elementary schools, all were Title I schools in a small rural district. At my former job, I was the technology specialist and also a fourth grade teacher. I used technology with my students and had a classroom set of iPads that I used in my classroom. I am proficient with technology and not afraid of it. I have a preconceived notion that technology can enhance classroom instruction if it is used the right way. Many times I see it being used as a substitution for a worksheet or as a word processor. I have taken and taught many graduate technology classes. Technology does not frighten me, as it does some teachers. I can see the positive aspects of using technology in the classroom. I have also seen technology being used just for the sake of using technology, or as something for students to do when they are finished, without a positive impact on learning. As a public school teacher, I was on many technology and curriculum committees. Currently, I am an assistant professor at a small state-supported liberal arts university located in the eastern part of South Carolina. I teach preservice teachers in the School of Education.

I observed the students using the iPads with an open mind, but also a critical one. I want to make sure that our tax money is used in the most effective way for the students possible. This could also be a weakness that I have to look out for that I am not being overly critical. In other ways this makes me a great person to complete this research. I am not easily awed by what little ones can do with technology. I am interested in how much the teachers gleaned from professional development and how much they have figured out

on their own. I realize staying current with iPads and apps is a huge time commitment and have empathy for a classroom teacher's time. Being someone new to each of the schools I observe is also to my advantage. I was not aware of the school culture or the ideas and beliefs of each principal. I did not know these teachers or their reputations so I saw what they brought to the classroom in terms of technology without my biases getting in the way.

### **Conclusion**

This chapter explained and justified the methods of qualitative design that I used to allow readers to see what the challenges and opportunities of using iPads are in the classroom for teachers. Qualitative methods helped examine how teachers used the iPad in their classroom and their attitudes/beliefs toward this device. The procedures for the selection of the site and the selection and recruitment of the participants were presented. The overview of the methodology established the data collection and analysis methods that were used in the study in order to address the research question of this study. Subjectivity and positionality were also discussed. Chapter 4 will analyze the data from the focus groups, classroom observations, and interviews. Chapter 5 will present discussions, implications and recommendations.

**Table 3.1** *Focus Group Participants*

Name of Participant	School	Grade Level
Michelle	First	4
Mary	First	5
Amber	Second	4
Suzie	Third	4
Candace	Fourth	3
Amanda	Fifth	5
Nancy	Fifth	4
Judy	Fifth	4

**Table 3.2** *Interview and Observation Participants*

Name of Participant	School	Grade Level	Number of Years Teaching	How long they have been one-to-one	Subjects taught
Michelle	First	4	27	3 years	math, science
Mary	First	5	7	3 years	math, science
Amber	Third	4	1	4 months	science
Suzie	Fourth	4	17	3 years	all subjects

**Figure 3.1 Observation Data Coding**

Name of Participant	Student Engagement and Learning			
	What activities/tasks were students asked to do to demonstrate their learning?			Comment [PB81]: 7 Immediate feedback 5 Create/Project
Michelle	Students listened to songs, completed long division problems, and sent them to the teacher. The teacher could then anonymously send a problem back for them to talk about why it was right or wrong.  Immediate Feedback	Students typed answers on iPads and sent them to the teacher's computer.  Immediate Feedback	Students used Classflow to go over their spiral review, then they used a QR code to get them to Quizlet so they could review for a test. Kahoot! as whole class review. Started project about severe weather where they could pick an app to show their learning.  Immediate Feedback	Create/Project
Mary	Write a song that explains the steps of long division.  Create/Project	Students used Google Earth to find each of the landforms they had learned in class in the United States.  Create/Project	Students answered a discussion question in Schoology that let them put in an answer to a math question and other students reply with suggestions to what they did wrong. Then they answered math questions on a pdf by writing with their finger and uploading the pdf to schoology for the teacher to grade.  Immediate Feedback	
Amber	Students were to find facts from the website about weather fronts and type them in "targets" on the weather map.  Create/Project	Students answered questions about prisms, while another took pictures.  Create/Project	Students watched an EdPuzzle video where the teacher had pre-recorded a lecture flip chart. The students took notes on paper and answered questions on the app that would be graded.  Immediate Feedback	
Suzie	Create a PicCollage with pictures and required information about the Boston Tea Party.  Create/Project	Answer review questions with the iPads being used as student response devices.  Immediate Feedback	Students were asked to write "code" to move the bird through a maze to the pig in increasingly difficult levels.  Immediate Feedback	Create/Project

**Figure 3.2 Interview Data Coding**

Name of Participant	Describe the kinds of student interactions you have seen since using the iPads.	
Michelle	M: Oh yeah, they love, I mean, (pause) they do that. They get in group discussions when they are working on a group project in class. Then they collaborate on it. And they work together. We haven't quite finished those because of time. Um, you know, I don't know if the kids have any more discussion that not using the iPad, but I mean, they definitely do group work and interact with them. And there are some that know more than others. And there are some stuff than I don't know. This is the way to do it and we all learn from them. (9:00)  I: I have seen, your little boy that sits right there help everybody.  M: He knows a lot about iPads, I think he uses it a lot at home. Some of the apps, if you don't use them every day, you forget. And they will remember how to go something, they love to share.	Cooperative-help each other
Mary	They are very helpful because I get confused I don't know if it is because I am old or what. I'll get confused between the different apps where you go to add or delete to do that kind of thing because they are all just a little but different. And the students will jump in quick with 'This is how you do it.' They are great about helping each other. They work great on the projects that you saw where they were in collaborative teams creating together. (18:00) They are very encouraging.	
Amber	A lot of the time when they are using the iPad one person gets upset because one person is not typing fast enough or somebody is upset because they are not the one typing today. That is not as often as it was in the beginning now that we use the iPads more often, but I did see that more at first. Now I see them working more cooperatively. Now that they are getting use to them	
Suzie	The help each other. My rule is ask each other first. (7:00) And they actually volunteer. They will volunteer to help each other.	

## CHAPTER FOUR

### FINDINGS

#### Introduction

The purpose of this study was to examine how teachers utilize a one-to-one iPad integration into their classrooms and to identify barriers and challenges. It is anticipated that the knowledge generated from this research will provide new insights into the impact of the device on teachers' technical issues, school-level support, pedagogical behaviors and teacher beliefs to inform integration practices in education. This chapter presents findings obtained from a focus group, four classroom observations, and four in-depth interviews utilizing the research question, "What are the challenges and opportunities of using iPads in the classroom for teachers?" Participants shared their thoughts and beliefs about integration of the iPads into their classrooms and several common themes emerged. Part One of this chapter first presents the individual cases by providing descriptions of each participant observation. In Part Two the data are then analyzed and a discussion is presented.

#### Part One: Participant Descriptions

**Participant One: Michelle.** Michelle is a 51-year-old white female. She has been teaching for 27 years with the last 15 at the same school. She has a Master's degree in Elementary Education. She teaches fourth-grade science and math at First Elementary in a small city in the district.

Michelle's classroom was bright and cheerful. The desks were pushed together to make three large groups with baskets of supplies the students need provided for each group. At the end of the groups were bins with glue, scissors, tape, staplers, and their own trash can. Michelle's desk was in the back corner. The only time I saw her there was when she was checking over someone's homework. Traditional whiteboards covered the front of the room with a Promethean board in the center. During each observation, the ceiling mounted projector stayed on. Michelle had 25 students in each class. Michelle had had the cart of iPads and been one-to-one for three years.

*Observations.* I observed two math lessons and one science lesson in Michelle's classroom. Classroom management was evident as the children seemed to know what to do and did so with no argument. One student had a behavior manager which means there is another adult in the room. The behavior manager took over some of the housekeeping duties for Michelle such as attendance and lunch choice. She also walked around and helped any student who needed it.

In two of the math lessons I observed, Michelle used an app called Nearpod. This app enabled her to know immediately if her students understood the lesson for the day. Michelle taught the students the steps to long division, they worked a few problems together, and then she let them try one. In the app, the students sent a screenshot of their work to the teacher. She immediately knew how many students understood, exactly who understood, and where she needed to go next. She could even anonymously send one student's answer back to the class so they could talk about whether it was right or wrong and where the student's understanding broke down. This was powerful. Michelle stated, "In the past to give formative assessment students would have to write the answer on

paper and wait for me to grade it. This helps me to individualize more than I ever have.”

As Nearpod has the format of a presentation, Michelle added in songs to help the students remember the steps to long division.

During the third observation, it was evident that Michelle and her students were very comfortable with the iPads because they used three different apps and an internet-based game. She was finishing a math lesson using Classflow, which is another app like Nearpod, that let Michelle present a math lesson on the board while it appeared on each student’s iPad. During the interview, Michelle stated to me that she has been trying both apps to decide which one filled her needs better and was easier to use. After math was finished, the students opened up a QR code reader app on the iPads and scanned one of several QR codes placed around the classroom. This took them to the Quizlet app where Michelle had made flashcards for the students to review for a test. The app also asked the students matching and multiple choice questions based on the material that Michelle had added. After ten minutes of individual review, the students went to Kahoot.it on the Safari app. The students typed in a code for their game and went through timed multiple choice questions that Michelle had written. After each question, the top five students’ names would appear on the screen; the faster and more accurate they answered the more points they received.

At the end of the period, Michelle discussed with the students a severe weather project she was assigning them. They could choose to show what they had learned about severe weather creating a weather forecast, music video, or book using iMovie or Photostory. The students were very excited to receive so much choice in the assignment.

**Participant Two: Mary.** Mary is a 47-year-old white female who also teaches at First Elementary. She has taught for seven years with the last four being at First. She has her Master's degree in Instructional Technology for the classroom and a second Master's degree in Reading and Literacy. She teaches fifth grade math and science. She has 27 students in one class and 28 in another. Mary has had her cart of iPads for three years.

**Observation.** When I came in for my first observation, it was College Day. The students and teacher all had on sweatshirts and T-shirts with their favorite colleges on them. Mary was telling the students how many colleges she had attended on her unusual route to the classroom. The students were very interested in her story asking lots of questions about all of the colleges she had attended. Then the students wanted to tell her why they were interested in a certain career or college. She told the students several times they had to wrap the discussion up because they were out of time, but there was always one more comment.

The student sat at tables. There were five tables with five or six students at each one. The tables were angled so that each could see the front of the room. Across the front of the room was a traditional white board with a Promethean board at the center.

As Mary wrapped up the college discussion, she told them that they were finishing their math projects today. Each group was assigned to write a song that explained the steps of long division. They could then make an iMovie or use Explain Everything app to make a presentation. These movie or presentations would be shown to the class. Because of the students' age and classroom procedures, once Mary gave instructions the students got into their groups and got to work with little assistance from her. She sat with me at a table in the back of the room that she used as her desk and gave



me a running commentary on the groups and what the students were doing. Seldom did a student come to her with a question and all seemed to be on task. Mary did organize which groups needed to have their video recorded and which adult they were to go with.

Later that same day, after lunch, I observed a science lesson on the iPads. The students went to the Google Earth app and in groups identified all the landforms they had been discussing in class. Again, after the initial instructions the student seemed to work well within their groups with little teacher assistance. Mary did walk around and monitor that the students were on task and were finding the landforms.

During the last observation of Mary's classroom the students were trying out two new apps, Baiboard and Schoology. There was a considerable amount of time spent teaching the students how to login and how to use the app. Once everyone was logged in they downloaded a math worksheet and worked one problem. They then sent their responses to a discussion board where other students could see their answers and respond to their work. Remarkably, the students looked over each other's answers and gave constructive feedback. They then learned how to upload this to Schoology, a learning management system the district wanted the teachers to use. They finished the lesson with a game of Kahoot! to review for a science test.

**Participant Three: Suzie.** Suzie is a 40-year-old white female. She has taught 17 years with the last 3 being in a self-contained 4<sup>th</sup>-grade classroom at Second Elementary. Being self-contained means she keeps the same set of students all day and teaches them all subjects. Second Elementary is also different from First because Second Elementary is in a different small city and is a Title I school with a high percentage of students that qualify for free or reduced lunch. Suzie also has her Master's degree in Reading and

Literacy. Suzie was also with the original group that received a cart of iPads three years ago.

**Observation.** Suzie had quite a smaller class with only 19 students. She had student work displayed in the hallway and in the classroom. The students sat in desks that were arranged in a modified U. There were six desks inside the U. The students kept the iPad on their desks all day and put them in the cart to charge at night. When I entered the students were finishing a Kahoot! review of astronomy. They were visibly excited by the game. Suzie did stop the game several times to go over questions that a large number of students missed making it a great formative assessment. After the game, the students showed me books they had just created with the app showing examples of different forms of figurative language.

On the second observation, student were using the PicCollage app to create invitations to the Boston Tea Party. They had information that was required to be on the invitation and they had to include a picture. These had to be uploaded onto Showbie, the learning management system that Suzie used. She gave the students a website to search for safe pictures that were not copyright protected.

The third observation was different than any of my other observations because the students were all working individually to complete an Hour of Code. This is a website that encourages students to learn basic computer programming. They complete this in game format where the goal is to get the Angry Bird to the pig. Most of the students had completed several of the levels at an earlier time. The students that had been absent that day were having a hard time getting logged into the website which created stress. One boy in the class did finish all of the levels on his own and helped his classmates. Many of

the students wanted help on every level and gave up when it became challenging. Having experience with video games helped.

**Participant Four: Amber.** Amber is a 25-year-old white female. She has only been in the classroom for three years. She is also the only teacher at her school to have iPads. The principal wanted to conduct a trial with one classroom and chose Amber, partly because when Amber student taught the classroom was one-to-one. She has only had the iPads for four months. Amber has been at Third Elementary her entire teaching career. Third Elementary is a Title I school and the most economically depressed of all the schools in the study. Amber teaches fourth grade and only science. The fourth grade at Third Elementary is departmentalized with each teacher teaching only one subject. The students are grouped homogeneously with a low group, high group, and two middle groups. This setup had changed several times during the school year because the principal is under stress to improve the students' test scores.

**Observation.** The students sat at tables, with three students at each table. The tables were arranged in symmetrical rows. For my first observation I observed the low group. Their task for the day was to label items on a weather map in ThingLink. Before letting the students touch the iPads, Amber gave exact instructions and instructed them on their group roles. She then questioned them about what their assignment and roles were. Once she felt like they understood she let them turn the iPads over. She had divided the assignment into small chunks and gave them four minutes to complete each section. Once the timer went off she went over the part they had just completed and again gave directions for the next part. With all this instruction there were still students that were frustrated and constantly raised their hands. One student was visibly frustrated and huffed

in and out loudly until Amber came to help her. Amber was on her feet running between groups during the entire assignment.

For the second observation, Amber had created an EdPuzzle lesson. She recorded a lecture in the app that the students could hear while they could see a PowerPoint presentation. The students were to keep notes and had to answer questions on the iPad. The app sent the answers to the teacher so she could check their progress. The students could watch, rewatch, pause, and rewind the lecture as many times as they wanted to. There was also an assignment written on the board if they finished early. It was evident that this was Amber's high group. Once they were given instructions, they were able to work on their own.

The third observation was also in groups. This combined hands-on learning with the use of a prism and the iPad to make observations. One group member was the photographer and took pictures of the prism and when it was at the optimal angle to show the visible spectrum. One student was the researcher, finding answers to questions about prisms. The last group member was in charge of the prism. The students used a QR code to direct them to the website where the research information could be found.

## **Part Two: Data Analysis**

During the data analysis, the data were read and reviewed repeatedly until saturation was reached. I used analysis to develop codes that reflected the words and phrases that captured the most important aspects of the data. I then clustered the data by grouping related words or phrases into major themes or categories. It is important to note that these categories were reviewed with reference to the research question, conceptual framework, and the literature.

The major findings that emerged from this study are organized according to the themes: technology integration, school level support, and teacher beliefs. Within technology integration, the categories that emerged from the data are first order barriers, time management, classroom management issues, and learning management issues. The second theme brought forth the categories principal support, professional development, and classroom management. Within the final theme, Teacher Beliefs, the categories that emerged are pedagogy, SAMR, and high stakes testing.

**Theme 1: Technology Integration.** The first theme is technology integration. Technology integration refers to the level of use of technology in the classroom, advantages and barriers to having iPads in the classroom, including technical issues, time management, and learning management issues. Each is described in more details below.

*First order barriers.* Although first order barriers are not as prevalent with technology as in the past (Ertmer et al., 2012) I did find some issues. First-order barriers are defined as those that are external to the teacher and includes resources (both hardware and software), training, and support (Ertmer, 1999). Some of the first order barriers identified in the study were headphones, district infrastructure, and Wi-Fi.

Every teacher observed and interviewed in this study had issues with headphones. In three of the four classroom the students were asked to provide their own headphones. Most provided earbuds, a smaller type headphone that fits inside the ear, rather than larger headphones that fit around the outside of the head like a headband. Earbuds can be found for under five dollars at discount stores making them inexpensive, but easy to break. Every classroom had earbuds that were broken. Mary stated, “I prefer headphones rather than ear buds. We may discuss the students providing those instead of the ear buds

with the school providing for those that cannot. The ear buds are so cheap that sometimes they push them in to the iPads too far and break the stem of the earbuds off.” One teacher, Amber, bought earbuds for every student in her class because she was afraid that many may not be able to purchase them.

Each teacher also had issues with district infrastructure. Amber said, “The Wi-Fi is always going out. One day a website is available and the next day it is blocked by the district’s filtering system.” While observing Suzie’s class, I observed a website that all the students had been to the day before but now had become unavailable for about half of the students. This frustrated the teacher and the students. During the focus group Amanda brought up, “Sometimes the iPads overload the internet and we lose Wi-Fi which shuts down the iPads for some time.”

***Time management.*** Using the iPads in the classroom takes extra planning time, especially in the beginning (Gülbahar, 2007). In the focus group interview teachers claimed to spend between 2 to 10 planning hours getting the technology ready for lessons for the students. Suzie said,

The first year of using the iPads it took probably a couple of hours to figure out every step. And then as I learn more I try to add to it. So, sometimes I can throw it together faster. I build on what I have and move forward.

Many times the teachers have to learn the app themselves, create accounts in the app for each student, and then they can start to create lessons in the app. This is initially very time consuming. During our interview Amber stated that planning time,

Depends on the app, if it is ThingLink or Qrafter or something that they are already familiar with, then the only thing I have to do is set it up for them and give them instructions. But EdPuzzle, I have to make the flipchart, record the video, and share it with them. So it is an extra two hours of preparation to set that up. And if it is something new then it is an extra hour of introducing it to them and allowing them to use it before it is really beneficial.

According to Sandholtz, Ringstaff, and Dwyer (1997), the shift to student-centered practice requires extended periods of time. This was exemplified by Amber. Amber noticed that she was still having to teach her students how to use the iPad and this was taking class time. After she gave instructions for the lesson and let the students get to work, almost every group had a hand up about how to use the iPad or the app. Amber stated, “A lot of the kids aren’t familiar with the technology. Anytime I introduce something new a lot of my day is spent showing them how to use it, this is how you get there, having them remember for the next time we use it. I am always reviewing.”

As expensive as it is to buy a cart of iPads for a classroom, it was imperative to me to find out how much the teachers are using them in the classroom. In the research according to Project Red (ISTE, 2010) over 40% of one-to-one technology integrated schools did not utilize the technology on a daily basis. In the focus group, the teachers self-reported that the classroom time using the iPads ranged from one class period a week to three hours a day, five days a week. It is to be noted that the teachers that had the carts longer (three years), on the whole, used the iPads with their students more often. Suzie

stated, “At first I only used the iPads a few hours a week, but the longer I have them I talk with other people and find new ways of integrating them on a daily basis.”

Using Hooper and Rieber’s (1999) teacher use of technology phases, the teachers that I observed were all at the fourth stage-reorientation or the fifth stage-evolution. The three teachers that had the carts three years (Mary, Michelle, and Suzie) tended to be more in the evolution phase continuing to evolve, adapt, and integrate the technology. The fourth teacher Amber, who had the cart of iPads only a few months, although she had some experience with them in student teaching, tended to be in the fourth stage reorientation where she used the technology for delivery of content and was focused on student learning. This was evident in two of my observations of Amber where she was still using paper as a backup. The students were researching answers to science questions, but writing these answers on a worksheet.

***Learning management issues.*** One barrier to technology integration that I had not anticipated was finding and using a learning management system. A learning management system, according to Techtarget.com (2016) is, “a software application or Web-based technology used to plan, implement, and assess a specific learning process.” Typically, a learning management system provides the teacher with a way to create and deliver content, monitor student participation, and assess student performance. In the past, teachers were instructing students to create digital content, but did not have a good way of students turning it in so the teacher could see it. Otherwise, teachers would have to look at every iPad in order to grade an assignment. Suzie used an app called Showbie that she put assignments into, the students completed, and then they uploaded their final product back into Showbie. Mary and Michelle were just beginning to use Schoology, an



app that the district was encouraging teachers to use. Amber, being new to the iPads was not at a place where she had begun to realize the use for a learning management system. This may be why she was still using worksheets. During one of my observations of Mary, she was beginning to use Schoology. Just getting each student their login name and password and getting them successfully logged in took 1 science period (40 minutes). This is a concern with iPads that the setup for each app is so time intensive when time is precious in a classroom.

**Theme 2: School Level Support.** School administration can help set the tone for how technology is embraced throughout the school. In general, in-service teachers' beliefs and practices shift to align with the current school culture in which they are working (Zhao & Frank, 2003). Therefore, school leadership is a critical factor in facilitating teacher change. One of the primary roles of school leadership is to support teachers and create a shared vision. Teachers need support in the classroom even more so when technology is involved. The categories that emerged from the data for the School Level Support theme include principal support, professional development, and classroom management issues.

***Principal support.*** Administrators play a role in the full implementation of technology throughout the school. Principals set the school culture, provide leadership, vision, motivation, and support the teachers in the day-to-day integration of technology (Zhao & Frank, 2003). In the focus group, seven out of the eight teachers recognized that their principals were supportive or encouraging in their iPad integration. Interestingly, the one teacher that felt her principal was not supportive was not the only teacher in the focus group from the same school. The other two teachers from that school felt that the

principal was supportive. Three teachers mentioned that their principal was financially supportive. Candace stated, "If there is a particular app needed or wanted to assist instruction, she has helped us to purchase it." Two teachers told that their principals allowed them to go to professional development during the school day. Only one participant from the focus group, Candace, stated that her principal, "Shares new apps and ideas she learns about with us." This was also evident when they were asked how much their principals knew about using the iPad in the classroom. Four out of the five principals had been to a basic two-week training in the summer and had their own iPad, but out of the five principals represented only one was proficient with the device, could actually teach with the iPad, and suggests apps for her teachers.

While observing Mary in the classroom, I noticed adults coming to the door to get students. When asked, Mary said she had mentioned that the students were recording video presentations and her principal offered to find school personnel to help video. Three different adults were pulled from their jobs for the day to support the students and the teacher. This same principal also let the teachers decide on an expensive computer-based course because they felt that the students were tired of the one they were currently using.

***Professional Development.*** Proper professional development is critical for successful implementation of technology into the classroom. In the focus group, five out of the eight teachers were receiving professional development. The three that were not were all at the same school. Their principal had not made the training available for them. The other five teachers are going to training once a month after school. During the monthly training, a new skill or app is talked about, teachers are encouraged to use it

there and get their questions answered. Then teachers are sent back to their schools to use it for the month. The next month they talk about how things were going, discuss issues, and learn something new. According to the research this is an effective way of providing training. Professional development should be an ongoing planned activity in order to truly encourage lasting change in education is one that has been embedded in the research (Ertmer & Ottenbreit-Leftwich, 2010; Slavit, Sawyer, & Curley, 2003). Effective professional development must start with what the teacher already knows and move them forward in small, incremental steps (Ertmer & Ottenbreit-Leftwich, 2010). Of the four teachers interviewed, all thought this training was going well. It was evident that they were trying the new things taught. As I went from room to room observing, I could see each teacher trying the app for the month. It had been helpful to many of the teachers to have fellow teachers also integrating the iPads to work through issues together and bounce ideas off of each other. Candace stated during the focus group, “I have colleagues that are extremely knowledgeable in technology and technology resources, so I am very blessed in that respect.”

*Classroom management issues.* Bringing in a cart of technology brings in a whole other aspect to classroom management. A system of passing out and collecting iPads must be established. There have to be procedures for asking for help, what to do if the iPad breaks, and when to recharge the battery. Michelle and Mary tried to prevent these issues. Michelle said,

We start off the beginning of the year with expectations and there are iPads rules and expectations. The parents and the kids sign them and they know if they were to maliciously damage it or something, they

would have to pay replace it. Students also know if they are caught doing things they are not supposed to be doing, they would lose their privileges for a certain amount of time. If it is repeated then they are gone for good.

Mary's principal also bought her pouches that go on the back of the chairs. When the iPads were not in use they were to keep them in the pouch so that they did not get knocked off of the desk. The desk pouches also had a helpful place to keep to keep the headphones.

In the focus group, other issues were discussed: digital citizenship, procedures for getting the iPads in and out of the cart, charging the iPads, making sure the students were on the app they were supposed to be, students putting passcodes on the iPads locking them or taking pictures on them, and searching for inappropriate things on the iPad. Teachers that have had the iPads for several years have come to expect these issues and have rules and expectations to prevent these issues. New teachers are learning that procedures help this process. During the focus group, Amanda stated,

One thing we've recently done is numbered the iPads making sure the same student uses the same number each day. It has eliminated some inappropriate use. We need to form some sort of contract for parents/students to sign about appropriate use of the iPads/technology.

Another classroom management issue that came up in the focus group was evident in two observations. The issue was the teacher getting to all of the students for technical assistance. During Amber's lesson she was constantly moving from table to table answering questions; usually the questions were about the iPads although

sometimes they were about the content. I observed one girl on the back row become visibly frustrated when the teacher could not get to her “fast enough.”

**Theme 3: Teacher Beliefs.** Teacher beliefs have been shown to be heavily influenced by the subject and school culture in which they participate. According to Sugar (2005), it is critical that there is a positive attitude on behalf of teachers towards the integration of technology in the learning process, in order to have efficient technology integration. Teachers’ positive beliefs towards technology will make the learning process easier for both student and teacher. The categories that emerged from the data for the Teacher Beliefs theme were pedagogy and student-centered instructional practices, the Substitution Augmentation Modification Redefinition (SAMR) model, and the effect high stakes testing has on technology use.

**Pedagogy.** The creation of digital classrooms and the implementation of a student-centered learning approach have placed new demands on teachers to transform their pedagogical practices (Voogt, 2008). In the new learning environment, teachers are expected to be facilitators who monitor students’ learning processes and provide them with timely support. Technology integration puts the responsibility of learning directly on the student. This student-centered approach to teaching and learning gives the student a dominant role in their education process and makes their learning more individualized. The student is an active participant who is engaged in the learning process as opposed to sitting and listening to information. The teacher is no longer the center of instruction and now serves a different role of facilitator.

Three out of the four classrooms I observed also used a website called Kahoot!. This was like a game show for reviewing. The teacher created the quiz on the website,

then showed the questions to the students. The students had to choose the right answer on the iPad. The website then gave an immediate display of how many students got the correct answer. If the majority of the students chose the incorrect answer the teacher stopped and retaught the skill. The students were visibly excited about Kahoot! because of the engaging graphics, use of the iPad, and the competition to see who could get the correct answer the fastest. One teacher, Suzie, was even planning a Kahoot! competition between her class and a class in Virginia.

All four classrooms I visited used the iPad as a tool for the students to create. Suzie said her main goal was to, “allow them to be creative, expressing what they have learned.” In her classroom, during one of the observations, students were creating an invitation to the Boston Tea Party, which they were studying in social studies. In Amber’s classroom the students were creating weather maps, putting warm and cold fronts in the correct places. Mary had her students create a music video where they wrote a song about the steps of long division. Michelle had her students create a book on the iPad about severe weather. All of these classroom projects were digital, using no paper which is an objective each teacher talked about.

Two of the teachers, Amber and Suzie, spoke of wanting to use flipped learning. This was the topic of one of their professional development sessions and an idea being pushed heavily by their district superintendent. According to the Educause website (2012), with the flipped learning model,

Students view multiple lectures of five to seven minutes each on a digital device. Online quizzes or activities can be interspersed to test what students have learned. Immediate quiz feedback and the ability to rerun

lecture segments help clarify points of confusion. Instructors lead in-class discussions or turn the classroom into a studio where students create, collaborate, and put into practice what they learned from the lectures they view.

I observed Amber teaching a “flipped” lesson. She had prerecorded her voice over a Power Point into the Edpuzzle app about the properties of light. The students had to answer questions about the lecture. They could re-watch the lecture as many times as they wanted in order to find the answers.

**SAMR.** As I observed each of the four teachers, I evaluated their lesson according to the SAMR model. The SAMR model is a basic grid that attempts to define different levels of technology tools and their use in the classroom. It implies a hierarchy behind technology use, giving a “goal” to shoot for. The model makes the teacher think about how the students can be increasingly challenged to use technology in deep and meaningful ways that support higher-order thinking (Marcovitz & Janiszewski, 2015). SAMR stands for substitution, augmentation, modification, and redefinition. Learning activities that fall within the substitution and augmentation classifications are said to enhance learning, while learning activities that fall within the modification and redefinition classifications are said to transform learning (Puentedura, 2013).

I observed four teachers for three lessons each. Of the twelve lessons, two were Substitution, where the technology was used to perform the same task as was done before the use of iPads. These lessons were from the teacher who had the iPads only a few months, and she and the class were still acclimating to them. An example of a

substitution lesson is labeling weather fronts on a weather map on the iPad when the students could have labeled the fronts on a paper map.

Five of the lessons observed were Augmentation on the SAMR scale where the iPad offered an effective tool to perform common tasks. An example of an Augmentation lesson is using the Google Earth app to find landforms in the United States. These landforms could have been found on a paper map, but using this app made it easier and more effective.

Modification and Redefinition are considered Transformation on the scale. Transformation is where the fundamental nature of the work is changed due to the influence of technology, which enables new tasks to be created. As a lesson moves along the continuum, technology becomes more important in the classroom but at the same time becomes more invisibly woven into the demands of good teaching and learning (Puentendura, 2013). Five of the lessons were Modification. An example of a Modification lesson observed was the students writing their own scripts using the steps of long division and having the choice of creating an iMovie or Educreations book to be later shared with the class. While I did not observe any Redefinition lessons, I feel that the teachers were very close to this, especially with the immediate feedback and self-pacing of the Nearpod app.

***High stakes testing.*** There is a perceived need by teachers to “teach to the standardized test.” This poses a potential challenge to teachers who wish to engage in student-centered practice. After reading the current literature, I assumed this would be a big concern for the teachers, the opposite seemed to be true. Seven of the eight teachers in the focus group stated that they are using the iPads to prepare for state testing. Nancy



said, “I am using the iPads to practice for state testing by using the prepdog.org website with students. Time is a big issue. I must make sure every minute using the iPads is purposeful.” Amber stated, “I know the tests are starting to get more inquiry-based than content-based especially as they get more rigorous. So I am using the iPads to develop more inquiry skills to prepare for the state testing.” None of the participants in the study said that they would stop using the iPads closer to testing to review.

### **Summary**

This chapter presented participant descriptions and the major findings discovered in this study and how they related to the literature. Findings were organized to reflect the themes, categories, and the study’s research questions. Data from focus groups, teacher interviews and classroom observations revealed participants’ perceptions of their experiences implementing the iPad as an instructional tool in their classrooms. As is typical of qualitative research, direct participant quotations are embedded throughout the chapter in an effort to portray accurately the reality experienced by the teachers.

## **CHAPTER FIVE**

### **IMPLICATIONS AND CONCLUSIONS**

#### **Introduction**

The purpose of this qualitative case study was to investigate elementary school teachers' experiences with implementation of one-to-one iPad technology in their classrooms. This chapter contains a summary of the major findings to answer the research question. The recommendation for future research section suggests future research topics that relate to this topic. Finally, I offer recommendations of actions for educators to implement into their practices in the limitations and implications for practice section. It was hoped that the knowledge generated from this research would provide new insights into the impact of classroom one-to-one iPad integration on teachers as well as inform integration practices in educational practice in general.

#### **Summary of Findings and Conclusion**

In an attempt to evaluate my own bias constantly, I engaged in ongoing discussions with colleagues knowledgeable of the research process, as well as those knowledgeable of the one-to-one iPads integration. Additionally, the research design called for triangulation of the data through the use of multiple data collection methods, member checks, and obtaining multiple perspectives. For the current study, a 17-question semi-structured interview protocol was designed to capture each individual's perspective. Direct classroom observations and focus groups interviews were also used to triangulate the data for this case study. Nonetheless, this chapter is strictly my interpretation of the

teachers' experiences and the research could certainly have been understood or interpreted differently by others. Qualitative research, by definition, is subjective and therefore subject to bias on the part of the researcher at each stage throughout the process. I acknowledge my potential for bias based on my prior experiences and knowledge on the topic of technology integration in the classroom. I, however, was committed throughout the process to self-reflection, reflexivity, and peer and participant validation to ensure validity and reliability.

While Chapter Four divided the data into manageable chunks in an effort to expose the phenomenon as experienced by the participants, this chapter's purpose is to provide an integrated understanding of those experiences and how they relate to the research question- What are the challenges and opportunities of using iPads in the classroom for teachers? For these overarching and interrelated ideas, I synthesized the related patterns found in the data. The synthesized interpretations and conclusions are intended to provide new insights into the impact of one-to-one classroom iPad integration on teachers. They are as follows:

1. All of the participants of the study are teachers who wanted to participate in the one-to-one implementation. Each one of them was enthusiastic about the implementation. Findings may be different if the technology is imposed upon teachers that do not want to participate.
2. Teachers still have first order barriers with technology in the classroom. While it is impossible to prevent all barriers, district infrastructure should be in place before implementation is expanded. Also, procedures should be put into place for issues such as those found with the use of headphones.

3. With more technology use, technology integration issues come up that were not even conceivable in the past like learning management systems.
4. School level support is beneficial, but some teachers excel without it. The study found that the principals have a basic knowledge of the iPads, but had minimal or no knowledge of how to integrate the iPads into the classroom and teaching. Their lack of vision for technology in the classroom means any leadership efforts to help teachers transition to the integration of technology may be non-existent. You cannot lead what you do not know.
5. Teachers are not worried that technology will take away time from preparing for high stakes testing, but are using the technology to prepare for the test.
6. The iPad is an overwhelmingly powerful teaching tool. The mobile device is creating excitement, motivating, and engaging teachers and students in classroom instruction.

### **Limitations and Implications for Future Research**

The intent of the current study was to gain insight into the beliefs of elementary school teachers as it relates to one-to-one iPads integration in the classroom. This study was designed to be exploratory in nature. The strength of the study included the investigation of three data sources, interviews, observations, and focus groups in one context to gain that greater understanding. The focus of four teachers from one school district precludes the results from being generalized to a larger setting, but the results provide valuable insight.

I recommend further studies be conducted in an effort to expand understanding of how teachers might better approach implementing iPads in their classrooms. Taking this into consideration, the following should be considered for future research:

1. Based on the limitations of the study, a larger sample of teachers (across grades and disciplines) who have recently or are currently implementing one-to-one iPads should be conducted to determine if the same or similar findings would be discovered.
2. A similar study that examines the experiences of students involved in an iPad initiative. The study should focus on the impact the device has on student engagement and learning.
3. A study that compares the experiences of teachers who receive ongoing, job-embedded, content-specific professional development and teachers who receive only basic, content-generic training on iPad integration. This research should seek to examine whether teacher perspectives among the two groups are similar or different, as well as implications for shifts in pedagogical behaviors.
4. Additional research that analyzes the impact of iPad technologies on student learning and annual state assessments.

These additional studies could also assist building administrators and district office personnel throughout the one-to-one implementation and decision making process.

**Implications for practice.** It is challenging for school and district administrators to decide how the devices, such as one-to-one iPads will be implemented throughout the campus. This is where this study hopes to fill in the gap in the literature. Many studies (Bauer & Kenton, 2005; Zhao, Pugh, Sheldon, & Byers, 2002; Ertmer & Ottenbreit-Leftwich, 2010) have spoken of the challenges and barriers of adding technology to a

classroom. These studies did not have the added challenge of every student in the classroom having technology, and having that technology on their desk all day for their own personal use. Hopefully, this qualitative study has added to the research of the new challenges of being a classroom teacher in a one-to-one environment. Using these new data, the following practices should be considered by educators and district office personnel when planning to implement iPad technology in the classroom:

1. Create a digital place, perhaps a website, discussion board, or blog, where teachers implementing technology can go to get help, see what other teachers are doing, and provide feedback on apps and websites.
2. Make technology professional development available to all teachers.
3. Make sure all principals are trained and on board with the implementation and are there to support the teachers in their technology use.
4. Before adding more devices, district personnel should make sure that there is infrastructure to support it.

## **Summary**

This study sought to understand and to examine the beliefs of teachers integrating one-to-one iPads in their classrooms. Technology in the classroom has definitely changed in the last few decades. Teachers began using technology that was meant to make their job easier. In the last few years though the technology use has shifted from only teacher use to being in the hands of every student. This has created technology integration issues that had never been thought of. With proper and on-going professional development and administrative support, all of the teachers in this study have integrated this technology seamlessly.

Technology is ever-changing. In order to stay current several implications for future research are provided. With many districts nationwide going to one-to-one integration of technology, whether it is with iPads, other tablets, laptops, or other devices not yet dreamed of, there are several implications for practice that districts and personnel need to think of before committing to the big expense.

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**APPENDIX A**  
**FOCUS GROUP QUESTIONS**

1. How is the iPad use going?
2. What challenges are you having? (TI)
3. What do you think the best part of having the iPads has been? (TB)
4. How many minutes a day/week are you using them? (TI)
5. How much out of class time do you have to put into them? (TI)
6. What special classroom management issues have you had to think about? (TI)
7. How are you dealing with state testing, the iPads, and having enough class time? (TB)
8. Has your principal assisted you in any way with the integration? (SL)
9. Do you feel like you received enough Professional Development for integrating the iPads? (SL)

## APPENDIX B

### CLASSROOM OBSERVATION PROTOCOL

Teacher:	Subject:
Date:	Start Time: End Time:
Grade:	Number of iPads:

**Research question:** What are the challenges and opportunities of using iPads in the classroom for teachers?

Things to Look For	Observation
<b>Technology Integration</b>	
Are there any technical issues?	
In what way(s) did the teacher seem to have prepared for the use of technology during instruction?	
<b>School Level Support</b>	
<b>Teacher Beliefs</b>	
What pedagogy is used? Cooperative Learning, Direct Instruction using Lecture or Demonstration, Individual Seatwork, Drill and Practice, Project-based Learning, Group Discussion Teacher directed, Student-Centered	
What level(s) of SAMR were observed? Substitution Augmentation Modification Redefinition	
<b>Student Engagement and Learning</b>	
What apps were used?	
What activities/tasks were students asked To do to demonstrate their learning?	
How did the teacher monitor student progress during the class?	

## APPENDIX C

### QUESTIONS TO GUIDE THE INTERVIEW PROCESS

Teacher's Name:	School:	Subject:
Time:	Date:	Place:
Years of teaching experience:	Years teaching this subject:	
Years at this school:	Gender:	Highest level of education:
<p><b>Research question:</b> What are the challenges and opportunities of using iPads in the classroom for teachers?</p> <p>Technology Integration</p>		
Describe your experiences with implementing the iPad as an instructional tool. About how many minutes a day/week are you using them?		
What barriers or challenges have you had?		
What special classroom management issues have you had?		
Please share some specific iPad activities/lessons/apps in which your students have engaged this year.		
<b>Other</b>		

<b>Research question:</b> What are the challenges and opportunities of using iPads in the classroom for teachers?	
School Level Support	
How much preparation or training would you say you had before you implemented the device in your classroom?	
Was that training sufficient? Helpful?	
How much planning time would you say it takes to prepare a lesson using the iPads?	
How much does your principal know about the iPads in the classroom?	
How do you feel your principal has supported you with integrating the iPads?	
How do you think the other teacher feel about your class having iPads?	
<b>Other</b>	

<b>Research question:</b> What are the challenges and opportunities of using iPads in the classroom for teachers?	
<b>Teacher Beliefs</b>	
How did you feel when you heard that you would be receiving a set of iPads for your classroom?	
How has your pedagogy been influenced or not influenced since you began integrating the iPad?	
Describe the types of student interactions that you've seen take place when they are provided opportunities to use the iPad.	
What, if any, changes do you plan to make to integration in the future?	
How does state testing affect your use of iPads in the classroom?	
If a colleague from another school asks you about using the iPad in teaching, will you recommend him or her?	
Is there anything else that you would like to share about your experiences using the iPad as an instructional tool that we have not discussed?	
<b>Other</b>	