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Technology Self-Efficacy Beliefs of Ninth-Grade Students after One Year of One-to-One Initiative Implementation

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Approval Page

This applied dissertation was submitted by Adrianne Nicole McGee under the direction of the persons listed below. It was submitted to the School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

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Abstract

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This dissertation was designed to gather data regarding the self-efficacy beliefs of ninth graders after experiencing the one-to-one technology initiative for 1 school year. The goal was to obtain information based on the experiences of the students in order to enlighten leaders of other schools and districts when implementing their own technology initiatives. Students, teachers, and administrators were all surveyed regarding the initiative and perceived experience. A focus group of eight students was conducted in order to gather more data regarding the answers to the survey questions. After focus group data were interpreted, three student interviews were held to gather more data regarding the needs of the students in order to feel more confident when using technology for educational purposes.

The student and teacher surveys reported overall high areas of self-efficacy after 1 year of using mobile devices in their ninth-grade classrooms. The results seem to point to previous experience with the iPads, multiple teacher instruction, and the popularity of Apple products as factors that led to the mostly positive responses regarding self-efficacy. Frustrations, which may have led to decreased levels of self-efficacy, seem to lie in the areas of students' perceptions of teacher confidence when utilizing the devices in the classroom, not having the appropriate programs to permit (or having restrictions which prevent) maximized learning experiences, and teachers' lack of consistency when using the iPads in various classes. According to administrators, teachers, and students, in order to make the initiative better, teachers and administrators should have received more training prior to implementation, the rollout procedure needed to be more precise, and students would have liked more paper/pencil assignments to go along with the iPad use.

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Chapter 1: Introduction

Students of all ages in this country are experiencing an ever-present achievement gap (National Center for Educational Statistics, 2011). This, along with the rising demand for schools to provide students with 21st century skills, has forced states, districts, and schools to reevaluate how the educational setting should look (Franklin, 2011; Peluso, 2012). Some school districts have begun to implement increasing levels of technology into the classroom across subject levels (Ahmed Atta, 2012; Barrow, Markman, & Rouse, 2007; Bloemsma, 2013; Castagnaro, 2012; Crichton, Pegler, & White, 2012; De Abreu, 2010; Franklin, 2011; Huang, Yang, Yueh-Min, & Hsiao, 2010; Kay & Lauricella, 2011; Lam & Tong, 2012; Livingston, 2012; Peluso, 2012; Peters, 2007; Rossing, 2012; Stortz & Hoffman, 2013; Terras & Ramsay, 2012; Vu, 2013;). Students are struggling to meet state standards. According to school, district, state, and national report cards, many students are below grade level in various subjects.

Bandura (1994) described self-efficacy as people's beliefs about their capabilities to produce effects. The ability of students to self-monitor and self-manage in an educational environment utilizing technology can be crucial (Terras & Ramsay, 2012). There is little research telling us how confident students feel about their technology skills and what teachers could do to increase this self-efficacy in classrooms that have included technology as a learning tool.

Statement of the Problem

Schools across the country are incorporating various forms of mobile technology in classrooms to aid in learning (Peters, 2007). Young people and people in the workforce using technology in their daily lives are increasing from year to year (De Abreu, 2010; Peters, 2007). It has been shown in various studies that technology in the

classroom can be a positive influence on student learning and a useful tool to prepare students for the future (Barrow et al., 2007; Peters, 2007). With schools and districts struggling to meet state standards (News Archive, 2013), more research is needed to determine the effects of incorporating mobile learning and how to help create student self-efficacy when using the technology.

Student achievement in the classroom is an issue in South Carolina (South Carolina Annual School Report Card, 2012). With regard to the current standards, students are not on grade level for subjects in which they are tested yearly. According to the South Carolina Annual School Report Card (2012), 34% of fourth graders and 25% of eighth graders were below basic in reading nationally. Eighteen percent of fourth graders and 28% of eighth graders nationally scored below basic in math, according to the same document. In South Carolina, 39% of fourth graders and 28% of eighth graders were categorized as below basic in reading, and 21% of fourth graders and 30% of eighth graders scored below basic in math (South Carolina Annual School Report Card Summary, 2013). Statewide, only 90.7% passed the English portion of the High School Assessment Program (HSAP), and only 83.5% passed the math portion in 2013. Statewide end-of-course (EOC) scores yielded 82.8% passing in math and 77.2% passing in English in 2013 (News Archive, 2013). This has shown to not only be a problem nationally and statewide but also on the district level. In a suburban school district in South Carolina, the HSAP pass rate was 93.6%, and the EOC pass rate was 73.1% – both reporting an average among subjects (South Carolina Annual School Report Card, 2012). This lack of proficiency has continued to be a concern within school districts. Until all students are at least on the basic level (the categories in the reports above included below basic, basic, proficient, and advanced) in each academic discipline, more needs to be

done in order to meet the needs of the students falling behind.

In order to provide students with the extra help they may need, many educational institutions have implemented a 1:1 environment in the classroom where students have access to their own technological devices to aid in the learning process (Ahmed Atta, 2012; Barrow et al., 2007; Bloemsma, 2013; Castagnaro, 2012; Crichton et al., 2012; De Abreu, 2010; Franklin, 2011; Huang et al., 2010; Kay & Lauricella, 2011; Lam & Tong, 2012; Livingston, 2012; Peluso, 2012; Peters, 2007; Rossing, 2012; Stortz & Hoffman, 2013; Terras & Ramsay, 2012; Vu, 2013). The district in this study claims Project RED as their basic source of information regarding the history and research of incorporating technology into the classroom. Project RED was formed by a group of five educational technology experts and visionaries to determine what needs to be done in order to create success when incorporating technology into the classroom. "Project RED (Revolutionizing Education) was inspired by the desire to contribute to the reengineering of education through research and through sharing compelling stories of transformation" (Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012, p. ix).

Project RED conducted extensive research on over 1,000 schools that incorporated technology (Greaves et al., 2012). They focus mostly on what makes the project work and how it can save districts money. They found the following.

- Properly implemented educational technology can substantially improve student achievement.
- Properly implemented educational technology can be revenue positive at all levels—national, state, and local.
- Continuous access to a computing device for every student leads to increased

> academic achievement and financial benefits, especially when technology is properly implemented. (Greaves et al., 2012, p. 1)

They obviously received some nationwide attention regarding their studies. This was the first national research made available to emphasize the educational benefits of implementing technology into the classroom (iRock, 2013). In this study, there is a huge emphasis on the importance of all stakeholders buying into the idea of technology integration, and the study focused on the 33% of schools that reported academic gains due to the 1:1 initiative (Greaves et al., 2012). Project RED determined that academic performance can increase significantly while also saving school districts money in the long run (Greaves et al., 2012). They found the following data.

- Proper implementation of technology is linked to education success.
- Properly implemented technology saves money.
- 1-to-1 schools that properly implement technology outperform all other schools, including all other 1-to-1 schools.
- A school principal's ability to lead is critical to the success of an implementation effort.
- Technology-transformed intervention improves learning.
- Online collaboration increases learning productivity and student engagement.
- Daily use of technology delivers the best return on investment (ROI). (Greaves et al., 2012, p. 10)

Even without proper implementation (based on their recommendations), Project RED found results from districts that incorporated the 1:1 initiative to increase in the following areas significantly.

- 65% report disciplinary action reduction.
- 70% report high-stakes test scores increase.
- 58% report dropout rate reduction.
- 57% report graduation rate increase. (Greaves et al., 2012, p. 13)

For those schools that practiced fidelity in the areas of using technology daily in intervention classes, principals leading professional development (PD) at least monthly, student collaboration daily, and core classes using technology daily, the positive results were as follows.

- 92% report disciplinary action reduction.
- 90% report high-stakes test scores increase.
- 89% report dropout rate reduction.
- 63% report graduation rate increase. (Greaves et al.,2012, p. 13)

The data from this study went even further to cite various school systems that followed most of the key recommended factors and showed improvements in money savings (projected over time), academics, and discipline after implementation. The schools highlighted varied in size, student socioeconomic status and budgets (Greaves et al., 2012). The district in this study focused mainly on the Mooresville study highlighted in the Project RED data due to the population similarities. Mooresville made significant reductions in dropout rates, costs, and disciplinary issues and increases in academic gains (Greaves et al., 2012). From 2007 to 2011, the percentage of students scoring proficient or higher on end-of-grade (EOG) reading, science, and math tests increased from 73% to 88% (Greaves et al., 2012, p. 44). In conclusion, "Project RED data reveal that schools with a 1-to-1 student-computer ratio outperform non-1-to-1 schools on both academic

and financial measures" (Greaves et al., 2012, p. 44). With the implementation of the 1:1 initiative, the school district in this study hopes to make significant gains in all the areas highlighted above (iRock, 2013).

Student achievement in the classroom is an issue in South Carolina (South Carolina Annual School Report Card, 2012); and in order to provide students with the extra help they may need, many educational institutions have implemented a 1:1 environment in the classroom where students have access to their own technological devices to aid in the learning process (Ahmed Atta, 2012; Barrow et al., 2007; Bloemsma, 2013; Castagnaro, 2012; Crichton et al., 2012; De Abreu, 2010; Franklin, 2011; Huang et al., 2010; Kay & Lauricella, 2011; Lam & Tong, 2012; Livingston, 2012; Peluso, 2012; Rossing, 2012; Peters, 2007; Stortz & Hoffman, 2013; Terras & Ramsay, 2012; Vu, 2013;). The problem is, districts are spending a lot of money and putting a lot of faith in the use of technology in the classroom to close this gap, and there is a lack of research available regarding student or teacher self-efficacy when using the devices in the classroom.

In the South Carolina school district used in this study, the 1:1 educational technology program is currently being piloted with 370 ninth graders at one of the three high schools in the district. This particular school is comprised of 1,412 total students and 83 teachers. The movement to increase 1:1 student access to educational technology in the classroom has been coined The iPad Initiative (iRock, 2013). The district began iPad implementation during the 2013-2014 school year among elementary and middle school students (iRock, 2013). Only one of the three high schools was chosen to pilot the initiative and only ninth-grade core classrooms and select electives were provided with iPads for classroom use (iRock, 2013).

There is a lack of research focusing on student self-efficacy within the first year of using technology in the 1:1 classroom. There are plenty of studies based on teacher attitudes and efficacy upon implementing technology into the classroom (Bebell & O'Dwyer, 2010; Benton, 2012; Crichton et al., 2012; Peters, 2007; Rossing, 2012; Vu, 2013), but little is known about the importance of self-efficacy among students. In 2007, Peters (2007) released a study based on mobile learning that found the practice of gathering student input was still in the beginning stages and focused on learning how students want to receive information in school rather than their self-efficacy. The study found the implementation of technology a novel idea for teachers, and students were slowly being introduced to the concept. Since then, there have been a rising number of schools implementing not only technology but 1:1 environments for students to gather data and teachers to meet objectives (Dunleavy, Dexter, & Heinecke, 2007).

De Abreu (2010) conducted a study that found a 20% increase in time spent online daily from 2005 to 2010 among young people. With this fast-growing trend presenting itself in this age of ever-present technology, having high self-efficacy using mobile technology in the classroom can only help students become more comfortable utilizing this learning tool (Bandura, Caprara, Barbaranelli, Pastorelli, & Regalia, 2001).

How teachers choose to use technology in the classroom is of great importance (Peters, 2007). Teachers should be trained first how to implement the technology and monitor student use (Lam & Tong, 2012). With the amount of time young people are spending each day using technological devices, distractions are inevitable in the educational setting (De Abreu, 2010; Kay & Lauricella, 2011). This could mean they are socializing due to the fact that they have access to their phones during class, but how comfortable are students with using educational technology in schools that are adopting

the 1:1 initiative in the first year of implementation? Bebell and O'Dwyer (2010) conducted a review of four empirical studies regarding the impact of 1:1 classrooms. The studies presented in the review showed significant improvements in English/language arts (ELA) test scores and student engagement in the second year of implementation. This shows the practice can be beneficial for students in the educational setting; however, does it take 2 years for this initiative to show gains in student behaviors? Kay and Lauricella (2011) noticed how much time college students were spending with open lines of communication with their digital devices. Sixty percent of students reported having instant messaging open most of the time; however, 72% of students claimed the devices were helpful or very helpful when coupled with their academic loads. Based on the research, it is evident that technology can be valuable; but it is unclear how students feel about incorporating technology into the classroom setting in the early stages of implementation and what additions or changes would make them more comfortable.

Based on Bandura's (1977) study on self-efficacy, there is a degree of variance in self-efficacy depending upon past experiences; therefore, naturally, students may all be on different levels when beginning a new project. Bandura and Kupers (1964) determined that models may impact how students react regarding self-recognition (exhibiting positive/negative behaviors when completing a task based on the outcome of their efforts). The reaction of the subjects in this study may be directly linked to technology in the classroom. It may indicate if teachers are not prepared to implement new technology, like the iPad initiative, and seem confused or ill prepared, that students enrolled in the classes of those teachers may have the same reaction (confusion, frustration), affecting their own confidence in using the technology. Bandura et al. (2001) stated, "Among the mechanisms of human agency, none is more focal or

pervasive than beliefs of personal efficacy" (p. 125). They also insisted that resiliency is an essential element of self-efficacy beliefs. If teachers convey a resilient attitude when implementing technology (monitoring and adjusting to issues/problems/changes), students may adopt this attitude. Griggs, Rimm-Kaufman, Merritt, and Patton (2013) found that "strong self-efficacy beliefs promote [student] achievement" in the academic setting (p. 369). Finally, Pajares (2002b) stated that when someone has high efficacy beliefs, they often have increased levels of achievement. If schools are going to spend the money on mobile devices, provide PD for teachers, and expect teachers to include the technology in their classroom settings (in addition to the standards and programs that have already been implemented), student feelings regarding their own capabilities to use such devices in the classroom could be valuable. Student input regarding this 1:1 technology pilot study implementation process may help other school leaders determine what schools and classroom teachers can do to increase student self-efficacy in this area in order to provide essential transitional support.

Definition of Terms

1:1 educational setting. An educational setting which offers students individual access to technology (in the case of this study, iPads) with the hopes of increasing opportunities for higher order thinking skills, collaboration, refining research skills, and communication for students (iRock, 2013).

iPad initiative (according to this school district's vision). A program that allows every student to have a mobile learning device for use at school and home. It will be personalized and customized through unlimited apps and digital textbooks based on the individual needs and learning style of students. It will allow students to access instruction and provide them with the flexibility to learn anytime and anywhere (iRock,

2013).

Self-efficacy. "The response provided by individuals to the question 'what am I capable of doing?' with one's own skills under certain conditions and one's self-faith" (Tuncer, 2013, p. 33). For the purpose of this study, self-efficacy is defined as the level of confidence a person has in his/her ability to complete a task or utilize needed skills.

Basic. Denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.

Proficient. Represents solid academic performance. Students reaching this level have demonstrated competency over a challenging subject matter.

Advanced. Represents superior performance (National Center for Education Statistics, 2011, p. 2).

iDevices. Mobile devices powered by Apple (iPad, iPod, etc.) (iDevices, 2014).

m-learning. The use of mobile technology in the classroom (mobile learning) (Peters, 2007).

Purpose of the Study

The purpose of this study was to determine student self-efficacy of technology use in the classroom after 1 year of implementation. If this program was going to continue in order to increase student achievement and be implemented at the other two high schools the next year, a need existed to pinpoint the impact of student self-efficacy. Students were given the opportunity to voice their opinions, respond to survey questions, and participate in focus groups regarding self-efficacy and possible changes that would improve their experiences with the initiative implementation. The other two high schools in this district may be able to use the information gathered in this study to increase student self-efficacy among the participants during their 1:1 implementation next year.

The research questions that guide this study were

1. What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
2. What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
3. According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting?

Summary

This study gives an overview of how students perceive their success with the 1:1 initiative and what steps may have been helpful to make them feel more confident when using the devices for educational purposes. Since the school involved in rolling out this initiative is one of three high schools in the district, the other two schools may learn from the implementation that took place at this high school and use this study to determine what students need in order to be successful and motivated when using iPads in the classroom. The next chapter discusses technology with regard to students and teachers and also determines the importance and impact of student self-efficacy beliefs when incorporating technology into the classroom setting.

Chapter 2: Literature Review

With such a persistent achievement gap existing within school districts across the country (National Center for Education Statistics, 2011), some districts are choosing to implement 1:1 classroom environments where students are offered individual mobile technology devices with the hope that they aid in the instructional process (iRock, 2013). The research regarding the importance of high self-efficacy beliefs and student attitudes and self-efficacy and student/teacher accomplishment with regard to using technology in the classroom is varied.

Using Mobile Technologies in the Classroom

Across our nation, districts are adopting increasing levels of technology in the classroom to try to keep up with the ever-changing world of education. In a qualitative analysis of the national educational technology curricula, Aesaert, Vanderlinde, Tondeur, & van Braak (2013) stated, "It is globally accepted that children need to possess a set of new skills, often referred to as 21st century skills, to tackle the challenges of our present information society" (p. 132). These skills include "digital competencies" along with "collaboration, communication, and social and cultural competences" (Aesaert et al., 2013, p. 132). In her 2011 study on mobile learning and its impact on the educational environment, Ohio University professor T. Franklin found a need for digital citizenship in today's mobile society because of digital access, digital communications, digital rights, digital security, digital commerce, digital safety, and digital responsibility. In her study, she examined how the demand for 21st century skills will lead to a more rigorous learning environment – one that includes technology (Franklin, 2011). She focused on answering the question, "are we at the tipping point regarding mobile learning?" The study consisted of an extensive review of literature based on the topic of mobile learning

and provided many details and conclusions based on past research. Franklin (2011) focused on the rapid increase of young people using mobile technology and the demand for digital competency among young people in order to be prepared for the digital environment around us. She concluded that educators must provide specific opportunities regarding technology in the educational setting, which is expanded upon later in this chapter. Many young people already are using mobile devices in their everyday life for social reasons, and the inclusion of these mobile devices into the classroom is on the rise across the nation (Peluso, 2012). Educators are being pressured to change the way classrooms operate to meet the needs of a digital society (Livingstone, 2012). In their report based on how to appropriately incorporate mobile technology into the preschool classroom, researchers claimed, "To describe and explain young children's literacy development completely, the definition of reading and writing must be broadened to include multimedia and computer-based print" (Beschorner & Hutchison, 2013, p. 16). In order to meet the needs of a change of this nature, Manuguerra and Petocz (2011) stated, "teachers need a new generation of devices and software, easy to use and without a steep learning curve: the new class of post-PC devices such as the iPad could be just what is needed" in their report of iPad use in the live classroom and with distance learning over a 15-month period (p. 65). In this study, they concluded the world of technology moves too fast for many universities to keep up (Manuguerra & Petocz, 2011). It makes sense to take what students do for fun on their own time and attempt to incorporate those practices into the classroom. The new wave of more mobile devices can help meet this goal. Technology today is found in almost every aspect of life, and young people need to be prepared to use it for work and play (Ahmed Atta, 2012). It is, therefore, the responsibility of educational institutions to keep up with the quickly

changing trends (Manuguerra & Petocz, 2011).

Although many schools offer computer labs to students and teachers, there are certain advantages to having mobile devices. In their study on the challenges and requirements of students and teachers to make a mobile learning environment work, Crichton et al. (2012) determined, "The advantages of iDevices within school environments is their ready access to the Internet and other resources, longer battery life, size, short learning curve, and price point" (p. 29). If all students have access to their own personal mobile learning device during class time, the possibility for a more challenged-based environment is possible, better equipping students with 21st century skills. Teachers can provide more research-based, self-discovery type projects. "[Mobile learning has] the potential to fundamentally change the ways that learning and teaching are carried out, greatly favoring constructivist and collaborative approaches to learning, and flexible and adaptive approaches to teaching" (Manuguerra & Petocz, 2011, p. 61); however, teachers also are on a learning curve with all the new technology provided in schools. In her examination of whether schools desire to adopt the ever-growing technology-based classroom methodology, Livingstone (2012) stated, "Schooling in the digital age is a complex, compromised and often contradictory affair [but] this is not to say technology cannot act as a focus for improvement" (p. 12). Franklin (2011) stated that the traditional educational setting is no longer relevant, and teachers will become obsolete if they do not "embrace the changes that are upon [them] in how, where and why students learn" (p. 273). Therefore, it seems mobile learning devices have the potential to be more manageable in the classroom learning environment, so it would be beneficial for teachers and students to feel comfortable using these devices.

Educators in secondary schools should take some responsibility in preparing students for their future educational demands. Rossing (2012) used his own experiences from implementing technology into his classroom in his report. An instructor for Indiana University and Purdue University, Rossing was a member of a cohort of teachers chosen to roll out the initiative among their students. In his report, he offered reflections on the impact of technology in the educational setting. Through experience, observations, and discussions with cohort participants, he concluded the use of highly mobile technological devices in the form of smart phones, iPads, Kindles, etc. among college students increased between 2005 and 2010 from 1.2% to 62.7%, showing the possibility of mobile technology eventually proving more popular over laptops or other less-mobile devices (Rossing, 2012). It is imperative for students to become familiar with these mobile learning devices before college since their popularity is on the rise in the higher educational setting. Rossing found that enabling, engaging, and empowering students to use these mobile devices for learning opened up a wide array of learning opportunities that have become quite valuable to life after college.

Cellphone use is also on the rise. Franklin (2011) stated in his report that personal cellphone use has increased from "1.1 million cell users in 1998 [to] 85 billion cell users in 2011" (p. 262). People used to be pleased with the flip phone, but lately, smart phones are becoming more common (Franklin, 2011). Students are using them in the classroom to take notes, conduct research, check spelling and definitions, and conduct various other functions. "Students are already using a variety of technologies as part of their school day or to complete their homework assignments. The use of mobile technology is a logical 'next step' for them" (Franklin, 2011, p. 273). Due to this fact, teachers should be accepting and inviting to the current technology capabilities in order to encourage

students to practice 21st century skills. Hutchison, Beschorner, and Schmidt-Crawford (2012) quoted the International Reading Association's (IRA) press release from 2009:

> To become fully literate in today's world, students must become proficient in the new literacies of 21st-century technologies. IRA believes that literacy educators have a responsibility to integrate information and communication technologies (ICTs) into the curriculum, to prepare students for the futures they deserve. (p. 16)

As mentioned earlier, the 3 Es of education include enabling, engaging, and empowering (Rossing, 2012). In order to have the three Es, educators must provide individualized experiences, freedom to make mistakes, continuous access, transformed and transcended versions of the current learning model, communication and collaboration, documents that are easily shared/created, and the capability to record lectures/experiments (Rossing, 2012). Mobile technology in the classroom can enhance all aspects of these needs. "The conversation has generally moved from whether or not technology should be used to how it should be used" (Beschorner & Hutchison, 2013, p. 16).

Students have reported benefitting in many areas of the educational process. In a study of second-year Taiwan college students learning English, Yang (2012) stated, "Students considered that m-learning offered them more chances to acquire more information and supported collaborative and ubiquitous learning" (p. 152). Using an m-learning attitude survey, Yang (2012) spent time investigating the attitudes and self-efficacy beliefs of these students toward mobile learning. When Feltman (2013) conducted a study on the use of the iPad in the secondary biology classroom, he focused on the influence of technology on student performance, motivation to learn, and learning

strategies. The study specifically concentrated on iPad use in the classroom. Observational periods and EOC tests found the students in the experimental group (utilizing interactive technology) to be much more interactive than those in the control group (traditional educational setting). Students in the experimental group were noted as being engaged, interacting, smiling, laughing, and talking with their peers and teacher about the different terms for approximately 35 minutes while those in the control group were noted as being very passive, yawning, having heads down, and being inactive. This interactive atmosphere can motivate students to become more engaged in the classroom. In regards to sharing information among students, one student reported that using the iPads helped increase the pace of completing assignments since more could be done at once. Another commented on the increased quality and amount of material available since they could search simultaneously (Feltman, 2013). This environment, where data is easily shared and discussed, can create increased confidence in students regarding their competencies (Rossing, 2012). In a study conducted by student teachers based on using touch-screen technology in college Chemistry classes, researchers implemented three modules for a science lesson: one where no iPads were used, one where only the teacher used an iPad, and one where students used an iPad. Evaluations were conducted after each module to determine needs and experiences of students. The researchers found that "without the offer of any external rewards, the students were intrinsically motivated to complete their assignment" (Lewis, Zhao, & Montclare, 2012, p. 1016). Crichton et al. (2012) shared their experiences and lessons learned after implementing iDevices into the classroom setting. They focused on the environment required to support the devices and the opportunities and challenges students and teachers face with mobile technology. They used online surveys, monthly PD, teacher lesson plans, student work samples, and

classroom observations to collect data. Within this large urban Canadian school, they found that after iDevices had been integrated into the schools in their study for 1 year, they lived up to the hype; however, the study did specify the following had to be met for the devices to be fully effective: providing proper equipment and internet access, introducing students to the devices properly before administering assignments, using the equipment in meaningful ways that are directly related to the curriculum, and offering the option to take the devices home (Crichton et al., 2012). In the same study, the researchers found that 60% of the students involved had not previously utilized the iDevice, but 70% reported familiarity after less than an hour. With the growing use of a wide variety of personal devices (Droid, iPhone, iPad, Galaxy, Windows tablet, Kindle, etc.) for entertainment purposes, it seems students in the classroom have transcended that skill of problem solving to become easily familiar with new and upcoming devices used for educational purposes. The teacher may often learn new information about how to use the devices from the students.

Technology integration can actually lead to increased academic achievement and knowledge acquisition for all types of learners, especially when technologies are implemented with the goal that they will be used as tools to advance existing curricular objectives (Benton, 2012). Results from many studies have shown the mobile learning environment to increase learning across subject areas. Barrow et al. (2007) conducted a study on the benefits of computer-aided instruction (CAI). They implemented the I Can Learn program (Interactive Computer Aided Natural Learning) into prealgebra and algebra students of various levels. The goal of the study was to determine whether CAI or a traditional educational approach resulted in higher achievement levels. The study took place within three large school districts with a large population of Hispanic and

African-American students who struggled with attendance, teacher retention, and student performance. The groups were randomly selected and pre and posttests were administered, along with statewide tests, in order to collect data. With their study, Barrow et al. (2007) found an average score increase of 0.17 of a standard deviation on the posttest for students in the CAI group compared to students in the traditional classroom setting. This was statistically significant at the 5% level. Studies on the effects of using mobile technology in the math class have shown positive reports as well. "Students learning pre-algebra and algebra through CAI are 26% of a school year ahead of their classmates in traditional classrooms after one year" (Barrow et al., 2007, p. 34). Castagnaro (2012) based a study on evaluating the technology self-efficacy of sixth graders. An elementary school teacher, Castagnaro determined how what students already know, how their frequency of technology use, and which external factors impacted their general academic self-efficacy. Data were collected with this study using student questionnaires and teacher focus groups. Castagnaro (2012) concluded with this study the need for educational technology, namely iPads, during math instruction. Lewis et al. (2012) reported that among the students with whom they implemented m-learning, the iPads were "fascinating the students and keeping them occupied during the lesson" (p. 1014). Perhaps due to the growing demand of technology skills and individual devices in the classroom, mobile learning devices are more efficient and effective for research than labs or a library (Storz & Hoffman, 2013). Abulibdeh and Hassan (2011) stated mobile technologies in the classroom "could support or enhance students' academic achievement" (p. 1020). Significant growth was found in the Owston and Wideman (1997) study of the quality of student writing in the 1:1 environment over the other traditional classroom setting. Referring to literacy, another study concluded, "children

can develop emerging knowledge about print in digital contexts using an iPad, or a similar tablet, and that it offers unique ways to employ reading, writing, listening, and speaking within one context" (Beschorner & Hutchison, 2013, p. 23). Benefits are shown in various subjects when utilizing mobile technology in the educational setting.

There are some studies that present results showing insignificant effects on students when incorporating mobile learning in the classroom. Faculty observing students in one study found the iPad had negligible effects on student participation, comprehension, and academic writing; however, both students and faculty preferred and recommended digital course materials for students on a tablet device (Bush & Cameron, 2011). It all may boil down to fidelity of implementation within the classroom walls. Without a clear set of guidelines, national technology education curricula can be jumbled and overlapping between grades and even by skill definition. More structure is noticed in countries with more centralized educational systems. As with anything, having structured curricula does not ensure proper implementation (Aesaert et al., 2013). Use of interactive technology would be enhanced for instructional and assessment purposes if it is correlated with a specific objective (Feltman, 2013). Ensuring these specific objectives are met, along with the introduction of new technology during the school day, can be complicated. Therefore, it may be helpful if teachers are prepared with proper PD and implementation strategies. This is examined in more detail in the next section.

Teachers and Technology in the Classroom

American teachers in today's society are under a great deal of stress to keep up with new initiatives (Peters, 2007). Districts have begun implementing new strategies to keep the classroom relevant and the students engaged (iRock, 2013). The inclusion of the 1:1 classroom initiative is one way districts are struggling to keep up with the ever-

changing world of technology (iRock, 2013). Teachers are expected to complete additional PD hours to prepare for the changes and to strive for quality incorporation with standards and daily objectives. Although these learning opportunities are available in abundance in the school district implementing the 1:1 classroom program in this study, the extra time may be difficult for teachers to find (iRock, 2013). This can lead to ill-preparation, uncertainty, and resentment among teachers (De Abreu, 2010). Some studies determine teachers to be poor leaders of the technology initiative taking place in districts across the country. De Abreu (2010) found that even though media literacy education and digital technology instruction were deemed imperative to teachers, they still demonstrated poor focus and confusion in both areas. Storz and Hoffman (2013) found teachers to be ill-prepared during their study based on 1:1 computing at the middle school level. Vu (2013) studied 21 elementary and secondary school teachers and examined how they viewed iPad use in the classroom. He found the teachers used the iPads in three different ways – each student had one, each group had one, or the teacher used the iPad to teach with only. The teachers averaged 2.75 of 5 on a Likert scale (where 1 noted not useful and 5 noted very useful) pointing out that the iPads were considered somewhat useful. His study also showed a majority of teachers lacking iPad training and teacher skepticism regarding student learning benefits using the iPads. Some teachers used the iPads more frequently than others and the quality of the tasks or assignments assigned on the days iPads were used were reportedly higher. Lastly, Vu found the most common level of student learning was on the *comprehension* level of Blooms. With these strong beliefs, practices, and attitudes, the question seems to be how teachers could be held responsible for implementing technology into the classrooms when they are ill-prepared and under-enthused. In Benton's (2012) study, teachers

tended to continue to focus on standardized test preparation and to rely on the same instructional methods that they utilized prior to implementing the devices. With the constant pressure of meeting standards and other daily demands of the classroom, teachers may view this initiative as just one more burden to add to the list. The 21st century skills demand is not new to educators, but for some reason, there is still hesitation.

"There clearly exists a tension between teachers' desire to foster learners' creativity while at the same time striving for high attainment and effective class management" (European Commission, 2009, p. 24). One-to-one classrooms should focus more on how the technology will be used as a tool rather than using the technology itself. Teachers need an abundance of PD to implement this initiative properly (Bebell & O'Dwyer, 2010). Peters (2007) offered the following conclusions in his study on mobile learning. The teacher and curriculum coordinator will determine its success; teachers need to be educated on how to use mobile learning devices and their benefits first; a negative attitude towards mobile learning via cell phones during class time was obvious among teachers; curriculum and assessment need to remain at the core of the classroom environment; increasing avenues of mobile learning in the workforce is one of the main reasons we are seeing these devices in the classrooms; and the age/ability of teachers and the cost of the devices are limiting our implementation of mobile learning in the classroom setting. Therefore, with the increasing demand of mobile devices in the workforce, it is important they are introduced and utilized in the educational setting. Also, teachers must have access to an abundance of PD and leadership in order to become proficient in implementing the use of the devices in class. The more comfortable the teacher feels, the easier it will be for him/her to correlate the use of the devices to the

standards.

Concluding their study on the support required to successfully implement personal mobile technology devices in the classroom, Crichton et al. (2012) stated, "We are further convinced that educators have to consider a menu of devices and applications for their teachers and students – no single device is the answer to every teaching and learning situation" (p. 29). Teachers should first determine learning goals for activities using iPads and then decide what apps/tools within the iPad would be most beneficial to teach the skills. Teachers also need to consider which skills will be most helpful in the future for the students as 21st century learners and become trained on those applications. All of this should be done before creating the projects (Hutchison et al., 2012). In their study based on incorporating digital literacy skills in the fourth-grade classroom, Hutchison et al. (2012) created a list of realities that need to be considered prior to implementing iPads for instruction: apps can be difficult to use (i.e., changing font size, adding images); teachers may find a better way to save/share information while students are working on projects, possibly causing disruption; touch screens can cause functions to take place accidentally (i.e., when finger tracking during reading); the teacher may have to learn along with the students when troubleshooting – this may also take extra time; although it offers word processing apps, they are limited in capability; and after saving, editing is not allowed with some apps. Feltman (2013), in his study of iPad use in the biology classroom, was presented with an additional piece to consider: the technology expertise of the teacher. After observing and interviewing the students, the teacher was found to be limited in knowledge and sometimes learned as she went. Further, the students felt this fact impeded their learning flow, and they leaned on peers for technology support. The students reported they, and the teacher, would have benefited

from smoother transitions from instruction to learning if the teacher would have been better prepared. The students also reported there could have been greater variety in the way the iPads were used had the teacher been more prepared. Benton (2012) cited research by Gayton and McEwen (2010), where

> they examined 20 studies to relate to how professional development was commonly evaluated and devised a model for achieving effective professional development in technology. Their model described five levels of planning that are needed for successful teacher training: (1) professional development must be logistically planned, (2) what instructors need to know and be able to do must be identified before student learning outcomes can be established, (3) internal support is needed for effective integration, (4) changes to instructional practices must be identified and made measurable, and (5) student learning outcomes related to technology must be identified. (p. 23)

A qualitative study conducted in two high schools in California found that some schools and teachers with high access to cutting-edge technologies infrequently used the equipment to enhance the existing curriculum because of their perceptions that computers may not be appropriate for all student projects or lessons or because the teachers felt that the integration of technology did not comfortably fit into their existing pedagogical approaches (Cuban, Kirkpartrick, & Peck, 2001). Therefore, in order to become familiar and comfortable with the technological devices offered in some schools today, teachers should receive an abundance of PD and implementation techniques in order to view the devices as learning *tools* rather than an alternative to what is already being taught.

There seems to be a running theme in the research presented above. In comparison to the negative reports, when mobile technology is implemented correctly,

with proper PD and attitudes toward the initiative, benefits have been shown to be outstanding. Hutchison et al. (2012) claimed iPads are helpful for literacy instruction because students can use prior technological knowledge to utilize iPads without much teacher instruction; students work collaboratively to solve navigation issues; differentiation is easy due to various application availability; iPads are easy and quick to turn on and off, due to their easy access and limited required storage space; the teacher may, at the last minute, create a way students can use the iPads during a lesson; and various languages are available. Benton (2012) indicated that teachers perceived that iPads had the potential to positively impact student engagement and learning. This was based on teachers' perceptions of increases related to student time-on-task and improvements in quality of work.

If someone were to walk through a school today, he/she would most likely not only see students using mobile technology during class, but chances are, he/she would also see teachers using it in meetings, during planning, and during instruction. Many schools are striving to go *green*, and even principals and support staff are using the devices. Regardless of who is using the technology or how it is being used in the educational setting, all levels of implementation require massive training efforts and specific expectations of use. In a report compiling feedback from teachers, administrators, and students, Ensor (2012) quoted a participant: "Not only has it become the ultimate device for accessing information, reading e-mails, recording notes, taking and storing photographs and videos, texting friends, and listening to music, it has also affected my job as an administrator" (p. 193). The main priority for districts should be to train teachers effectively and allow them time to feel comfortable before expecting implementation of the devices to occur. Bandura et al. (2001) stated, "Unless people

believe that they can bring about desired outcomes and forestall undesired ones by their actions, they have little incentive to act or to persevere in the face of difficulties and adversities" (p. 125). Self-efficacy comes with feeling comfortable with the task you have at hand. Teachers may continue to feel threatened when they have a classroom of students who may not know how to utilize the device, much less create a project using it. Student feelings toward completing a task can come directly from the leaders who are at the front of the classroom (Bandura & Kupers, 1964). Both teachers and students may be doomed if teacher self-efficacy is lacking.

Professional Development and Best Practices during 1:1 Implementation

Many works of educational research suggest providing quality PD opportunities for teachers is imperative when considering implementation of technology into the classroom environment (Bennison & Goos, 2010; Courville, 2011; Edwards, Smith & Wirt, 2012; Faulder, 2011; Holcomb, 2009; Knestis et al., 2011; Shapley, Maloney, Caranikas-Walker, & Sheehan, 2008; Smolin & Lawless, 2011; Zucker & Hug, 2007). There are many details to consider when setting the scene for technology integration, but quality teacher readiness is at the core of creating a successful environment (Holcomb, 2009). There have been many studies based on what PD is deemed imperative and how the inclusion process should be laid out. Shapley et al. (2008) conducted a 4-year study in Texas on the effects of technology in the classroom on students, teachers, and schools. In order to ensure fidelity of implementation, they did several visits to the school during the 4-year period to conduct interviews and focus groups among students, teachers, administrators, and district employees within the 21 schools implementing the Technology Immersion Pilot (TIP) program. The TIP is a program Texas adopted to provide "a wireless mobile computing device for each teacher and student, technology-

based learning resources, training for teachers to integrate technology into the classroom, and support for effective technology use" (Shapley et al., 2008, p. i). They compared the schools that made great gains to those who were less successful and determined the differences. The schools labeled *highly immersed* resulted in more teachers and students implementing the program as intended (Shapley et al., 2008). "An overarching purpose of the study was the identification of traits of higher implementing schools and teachers that would provide information on effective implementation practices for other educators wanting to pursue Technology Immersion" (Shapley et al., 2008, p. i). The major finding was that higher immersion led to higher implementation over time (Shapley et al., 2008). Qualities and effects of higher immersion schools found in this study were

- Higher-level employees (superintendent, board members, etc.) were involved in writing the grants to receive funds.
- The majority chose to use Apple products due to their learner-friendly style.
- District leaders showed commitment by working closely with the schools and observing classroom practices.
- Principals showed commitment by stressing the student benefits, providing required professional development opportunities, holding teachers accountable for using the devices properly, and monitoring classroom practices.
- Individual schools provided strong professional leadership to help with daily issues.
- Parents were held less financially accountable, yet encouraged at-home use of the devices for learning.

- School reached out for ongoing informational, financial, and educational community support of the initiative.
- Schools provided appropriate Internet capability.
- Schools held professional development at high importance and reached out to device vendors for professional development opportunities.
- Constant, ongoing pedagogical support was provided within the school.
- Teachers were held responsible for participating in professional development and also participated in non-required sessions to improve classroom practices.
- Quality professional development was provided for new teachers to produce higher levels of immersion.
- Teachers provided a positive, supportive atmosphere among each other and believed utilizing the devices resulted in improved educational experiences for students.
- Students used the devices in various educational settings for various assignments and projects.
- Teachers assigned out-of-class activities to encourage immersion at home.
- Students saw the devices as beneficial to their own learning, organization, and future, and enjoyed using the devices in school.
- Schools engaged in continuous parent outreach to provide support.
- A wide cultural variety of teachers participated and most were in the middle of their teaching career (6-15 years).
- The school's insistence on program fidelity seemed to influence teacher practices the most.

- Principals provided a positive push toward utilizing the devices for student learning, provided planning time, and observed what was taking place in the classrooms.
- Teachers either participated in more professional development than what was required or gained more information from the required training.
- Teachers claimed professional development resulted in gains in their proficiency, ability, confidence, creativity, and development when implementing the devices.
- Teachers communicated more often with students and parents using the devices as opposed to simply using them for administrative duties.
- Teachers required students to use the devices in more varied ways and more often.
- Teachers believed the devices helped increase student achievement on various ability levels.
- Students listened, wrote responses, gained knowledge, and were strongly engaged significantly more.
- Teachers used the devices more frequently for learning.
- Tasks were more demanding (Shapley et al., 2008).

Shapley et al.'s study also suggested that leadership turnover resulted in less school buy-in.

The original principal at one school was an enthusiastic believer in Technology Immersion, yet teacher support had waned for a variety of reasons. The new principal, who learned that laptops were being used infrequently in classrooms,

> held a leadership retreat prior to the start of the third year to assess teachers' level of commitment to Technology Immersion. An Apple facilitator helped retreat participants, including district and campus administrative staff and grade-level teacher leaders (both technology "cheerleaders" and "naysayers"), understand the research base and rationale for Technology Immersion. By all accounts, the leadership retreat was a transformational experience, with teachers recommitting themselves to the project and vowing to use laptops "every day in the classroom." (Shapley et al., 2008, p. 17)

Due to the continuous support and on-site PD and leadership, veteran teachers engaged in stronger immersion over time (Shapley et al., 2008). PD days were offered in higher immersion schools in order to manifest training as a high priority (Shapley et al., 2008). The amount of on-site support also played a role in immersion.

> Higher Technology Immersion schools typically had adequate levels of campus support, whereas lower immersion schools often had insufficient campus staff to manage the number of students and laptop computers, and thus, were overwhelmed by the enormity of their assigned tasks. (Shapley et al., 2008, p. 19)

Stakeholders at all levels were included in the transition. "Higher Technology Immersion schools typically gained parent and community support for the project at the beginning and then continued their outreach efforts—informational, educational, and financial—across years" (Shapley et al., 2008, p. 24).

According to interviews with district leaders, principals, and technology specialists and focus groups with teachers and students at four higher implementing and four lower implementing schools, the following characteristics were seen among district leaders and principals within the higher immersion schools:

District Leadership:

- Project leaders with administrative authority and clout

- Strong buy-in and commitment to Technology Immersion

- Close and ongoing relationship with the middle school

- District and campus leaders work as a team

- Leaders monitor teachers' classroom practices

Principal Leadership:

- Effective leadership transition after principal change

- Articulates a vision and goals for Technology Immersion

- Strongly supports professional development

- Provides encouragement for teachers' changed practice

- Expresses goals and expectations for classroom technology use

- Monitors teachers' classroom practices. (Shapley et al., 2008, p. 14)

"Lower immersion schools more often had undependable networks, overloaded technicians, and varied technical problems that discouraged laptop use" (Shapley et al., 2008, p. 29). "PD at lower Technology Immersion schools was characterized by frequent changes in vendor trainers [and] brief sessions for teacher groups during or after the school day" (Shapley et al., 2008, p. 26). Therefore, when quality teacher readiness is held at high importance throughout the entire implementation process, all stakeholders are involved at each level of implementation, effective internet connection is provided, the devices are used frequently in various settings, and the at-home immersion is possible, the devices are capable of contributing to the success of students (Shapley et al., 2008).

A 2009 article by Holcombe was based on 1:1 programs implemented in Maine, Alabama, California, New York, Texas, Virginia, and Michigan and the student achievement gains, or lack thereof, in each area. Holcombe (2009) found "it usually takes five to eight years for an innovation to be implemented fully and for the impacts of the innovation to be discernible" (p. 53). Prior to any technological device being distributed to students, it is essential that teachers be effectively trained to use the devices and have ample time to become comfortable with using the devices in the classroom (Holcombe, 2009). "How and when laptops are distributed can play a key role in determining the success of a 1:1 initiative" (Holcombe, 2009, p. 53). This helps increase the parental involvement and support of the initiative. When initially issuing student devices, Holcombe's study found offering a Parent's Night was a helpful element. This would provide parents with exposure to school policies and the chance to ask questions regarding the devices. The model Holcombe suggested also provides every student with the opportunity to have continuous access to the devices by allowing them to not only have their own to use each school day but also to have permission to take the devices home. One best practice for schools to engage in would be to research what has worked in other districts comparable to their own when implementing 1:1 technology in the classroom and reach out to those administrators for assistance and direction (Holcombe, 2009). Holcombe stated, "The most effective PD is job-embedded, student-centered, collegial, ongoing, and metacognitive. PD needs to be provided to teachers on a regular basis across a continuum" (p. 53).

Zucker and Hug (2007) conducted a study of the 1:1 program implemented at the Denver School of Science and Technology (DSST). At the school in their study, Zucker and Hug reported, "considering strengths and weaknesses, the overall picture of the

laptop program that emerges is positive, with the advantages of providing laptops to students clearly outweighing the disadvantages" (p. 9). Ninety-one percent of students in the study reported the 1:1 devices to be either very helpful (46%) or somewhat helpful (45%) (Zucker & Hug, 2007). Part of the study focused on what the teacher training entails. Zucker and Hug also suggested that in order to train teachers effectively, ample quality instruction time must be provided. The school in their study provides all new teachers, as well as all new students, orientation and training opportunities. All teachers participate in a 2-week summer workshop while new teachers also attend a 5-day training session prior to the beginning of the school year. Teachers are also provided with ongoing training and experience-sharing sessions throughout the year, some of which the teachers themselves lead. Some of the sessions span several hours (Zucker & Hug, 2007).

> The school provides a range of critical support services to its teachers and students, from administrative support and vision statements about how to use technology, to technical support, training, and PD. This ongoing support from administration and staff promotes teachers' and students' thoughtful use of laptops, the Internet, and other digital technologies in support of DSST's core mission. (Zucker & Hug, 2007, p. 27)

Along with effective support throughout the implementation process, many other factors need to be considered.

> Technical support; PD for teachers and training for students; teachers' selections of digital resources and lesson plans; consistent administrative support; investments in hardware, licenses, and support staff; as well as other factors all contribute to this 1:1 program's success. (Zucker & Hug, 2007, p. 28)

One issue with the program at DSST is that 26% of students do not have Internet access at home. Approximately two of three teachers see this as a significant hindrance to those students. However, Zucker and Hug (2007) pointed out that the devices are not a solution to a problem of underachievement. Stakeholders at all levels, clear school goals, meaningful student utilization, teacher preparedness, resources, implementation methods, and many other factors work to make the tools successful (Zucker & Hug, 2007).

Knestis et al. (2011) conducted a study in a New Hampshire school district which gathered funds from several agencies to incorporate the 1:1 initiative. The study focused on evaluating the programs and determining effectiveness of funds allocated in various areas of implementation. The information provided in this section will report their conclusions regarding teacher PD and best practices for 1:1 implementation. The teachers in the study were evaluated on their current skill levels prior to implementing the initiative in order to determine what needs were present for instruction for each teacher/level of technology expertise. Teachers were asked to rate PD opportunities before and after they were offered/administered and also to disclose how technology was being utilized within classrooms/schools and their feelings regarding use and training. These data were gathered via surveys and focus groups. Student surveys and classroom observations were also used to gather data regarding classroom utilization (Knestis et al., 2011).

Presented below are recommendations and the supporting lesson learned based upon the findings and conclusions . . . .

1. Ensure there are strong technology infrastructures and technical support staff in place prior to implementation.
2. Ensure grantees effectively communicate the project goals outcomes to all

stakeholders.

3. Continue to provide teachers with high-quality, relevant, focused professional development opportunities.
4. Continue to provide teachers and students with the positive support and encouragement needed to facilitate their technology implementation and use.
5. Expand existing supports to facilitate nuanced applications of technology resources and higher-order instructional approaches.
6. Provide additional assistance to schools in need of improvement (SINIs) for obtaining their full allocation of resources and identifying strategies for putting the resources to use.
7. Budget and provide time for teachers to learn, plan and share information about new technologies.
8. Encourage more discussions among educators about the benefits of allowing students to access the school network from home.
9. Provide teachers with the skills needed to deliver challenging and engaging technology applications to students and experiment with new instructional practices involving technology.
10. Provide schools/districts with guidance and tools (both short-term and long-term) to help them evaluate the impact(s) the technology is having on student achievement.
11. Provide guidance to educators on best practices for using technology for differentiated learning. (pp. 172-175)

Edwards et al. (2012) wrote an article based on Mooresville Graded School District's 6-year digital conversion program to increase student achievement due to a drop in learning levels regardless of socioeconomic levels. The program included students in Grades 2-12, and some students had at-home access and some did not (Edwards et al., 2012). Test scores were shown to have increased among students (Edwards et al., 2012). This school district took an approach to 1:1 by including student mentors as well as on-site staff to help aid in the transition (Edwards et al., 2012). The following was provided to aid in the transition: "seven technology department employees . . . four help-desk managers who provide maintenance for the laptops and another 1,000 desktops, high school students to work at the help desks as an elective" (Edwards et al., 2012, p. 12). In addition,

> about 10 students per class block [took] a position to learn about technology maintenance from IT staff as part of this program. Students [worked] on various IT projects, such as creating maintenance handouts, installing software, and disassembling machines. The program equips MGSD students with the knowledge they need to properly care for and maintain their digital devices. (Edwards et al., pp. 12-13)

Stakeholders from all areas were also included in the process, and the school district voted to allow 10 days of early release for students so all teachers could participate in training and effective use workshops to encourage fidelity of implementation (Edwards et al., 2012). Summer sessions were held as well to smooth the transitional process (Edwards et al., 2012). This district focused on safe and effective ways of incorporating devices into the classroom to create maximal learning potential (Edwards et al., 2012).

> Professional development is differentiated by content level, grade level, and each teacher's response level. Today, Mooresville doesn't have just two or three leaders in each school; they have 15 or 20 in each who are acting as ambassadors and agents of change for the conversion program. (Edwards et al., 2012, p. 14)

Mooresville also involved community businesses to help with funding (Edwards et al., 2012). The test scores have continued to improve since implementation (Edwards et al., 2012).

In a study based on how classroom teachers can become fully equipped to incorporate technology in the classroom, Faulder (2011) focused on past research to determine the best practices for teacher PD. Faulder also conducted a study on a small Christian school in Ohio to gather data regarding PD needs for classroom teachers. This research suggested the most effective PD when implementing technology into the educational setting is continuous throughout the entire initiative, support-driven so teachers will have help when needed, and specific in its goals so all stakeholders will be well-aware of what is expected. A strong emphasis also needs to be placed on differentiation when conducting PD in this situation. "A failure to recognize the various levels of the educators involved in the PD will result in training that does not fit the current needs of each specific teacher and classroom involved" (Faulder, 2011, p. 4).

> The first step in developing a professional development program is to identify the needs of the teachers involved. Additionally, teachers should be included in the decision-making process, project goals should correspond to teacher needs, collaborative groups of similar content and context should be formed, and a connection between learning and practice must be established. (Faulder, 2011, p. 89)

All stakeholders should be included in creating the school-wide vision for technology implementation (Faulder, 2011). This school in Faulder's study provided 1 year of teacher-mentor training prior to rollout. Training then progressed to a novice training phase and included one more session for experienced teacher training – these can coincide. All three included a weeklong intense workshop along with monthly meetings lasting 4-6 hours. All needs were assessed prior to teacher-mentor training (Faulder, 2011). Teachers were involved in all aspects of PD planning. Faulder pointed out the integral role of the teacher and how they often catch the brunt of the criticism regarding incorporating technology into the classroom. Faulder suggested experienced teachers can serve as mentors for teachers who are less comfortable using technology. "Teachers need the support of meaningful, practical PD programs that educate teachers about ICT [Information and Communication Technology] integration for instructional purposes, rather than focusing on technology skill" (Faulder, 2011, p. 83). Faulder found teachers were ill-prepared for appropriate and effective technology integration and proper PD is the best way to remedy this problem. Conclusions also suggested "reluctant teachers and administrators can be encouraged to move toward effective ICT integration through ongoing, content-specific professional development" (Faulder, 2011, p. 85). Teacher training sessions for ICT inclusion should also be content-driven, interactive, and focused on what that teacher needs; however, student learning goals should always be kept at the forefront over goals for the program implementation (Faulder, 2011).

> The most effective way to ensure teacher growth and change with regard to ICT integration is to provide very specific ideas and resources for content-relevant integration, support teachers in risk-taking and innovative use of ICT in the classroom, and provide teachers the opportunities to experience personal

> successes with ICT integration in their classrooms. (Faulder, 2011, p. 93)

Bennison and Goos (2010) administered a large-scale survey to gather data regarding secondary math teacher needs when using technology in the classroom. Five hundred seventy-four technology surveys were returned. The surveys were sent out the first year high school students were required to utilize higher technologies in their classes within this district. The needs they found were in the following categories:

> Three of these categories referred to the type of technology (computers; Internet; graphics calculators), one to a perceived lack of any need for professional development (PD), two to constraints that detracted from the value of PD (time and access), and three to the desired focus for PD (how to use specific software or hardware; how to meaningfully integrate technology into mathematics learning experiences; how to design assessment tasks that meaningfully integrate technology). (Bennison & Goos, 2010, p. 38)

The teachers who expressed the desire for more PD wanted not just more information on how to use the technology but how to effectively incorporate the devices into teaching (Bennison & Goos, 2010). They found teachers with less experience, with teaching and technology both, participated less often in technology-based PD (Bennison & Goos, 2011). Based on survey responses, Bennison and Goos suggested "professional development participation is related to greater confidence with technology and more positive beliefs about technology use being beneficial for students' learning of mathematics" (p. 52).

Courville (2011) suggested, "if technology is used in an effective manner within a training program, there should be quantifiable differences in terms of the knowledge learned and behavior exhibited by trainees in comparison to experimental control group;"

therefore, teachers should be surveyed or interviewed before and after implementing what they learned in training (p. 11).

Smolin and Lawless (2011) "discuss three specific collaborative evaluation models, examine key issues associated with implementing them, and analyze how each model has the potential to strengthen and sustain professional development partnerships" (p. 92). They discussed various PD sessions for technology integration and their success. During their evaluation, Smolin and Lawless found "it is through their direct work with students that [teachers] can incorporate what they have learned within their teaching practice and implement transformative technology practices within their classrooms. Ironically, teachers' roles in evaluation are typically as limited, passive respondents" (p. 93). They found that the experiences regarding technology integration PD of individual teachers vary from one person to the next (Smolin & Lawless, 2011). They suggested the process involve a combination of stakeholders in order to cross boundaries (Smolin & Lawless, 2011). "Teachers should be actively involved in the implementation process," and all stakeholders should participate in setting project goals and share the responsibility of the outcomes (Smolin & Lawless, 2011, p. 97). When suggesting changes, they found periodic observation data analysis by all stakeholders throughout the process would have been very helpful to check for problems along the way (Smolin & Lawless, 2011). They also found getting feedback from teachers regarding the tools they used for data collection would have been helpful in gathering necessary data (Smolin & Lawless, 2011). There needed to be a shift from solely evaluating outcomes to evaluating processes as well (Smolin & Lawless, 2011).

With regard to implementing a 1:1 initiative, PD and best practices are held at high importance among schools that have created a successful environment. Students

play a role in the success of the devices as well, which is discussed in the next section of this chapter.

Students and Technology in the Classroom

It is difficult to walk into any secondary or postsecondary educational facility in the present day and not notice how many students have access to personal mobile technology devices. Franklin (2011) reported 44% of high school students have access to smart phones and 67% have access to laptops. The increase has been dramatic over the last several years as technology has become more common, mobile, and affordable. In 2005, De Abreu reported young people spending approximately six hours a day online. In 2010, the hours rose from six to eight. Kids are spending a lot of the time they are awake online! The use of social media has increased greatly with the availability of mobile technology devices available among young people (Ahmed Atta, 2012). Students use social media to filter/manage content; post pictures, videos, and blogs; and instantly connect with their peers (Ahmed Atta, 2012). Ahmed Atta (2012) examined blogs, wikis, podcasts, and social networks to determine how staff members were using them in the classrooms, how students used them in life outside the classroom, and how they can be used to connect students and professionals for learning. All of these skills can easily transfer to an educational environment and are proving to become quite meaningful in some aspects of learning. There are also, however, some aspects that may impede the learning process.

Due to the reported disengagement of students in the educational environment, Bloemsma (2013) conducted a study based on relating what students learn in class using mobile devices to the real world. He compared student engagement in mobile learning environments using the iPad versus traditional settings. Bloemsma was a graduate

student during the time of this study, and he was interested in discovering which iPad activities were appealing and transformative in the classroom across four different disciplines. Bloemsma used student self-reports and interviews with 11 students. Results showed a majority of students reported more positive responses regarding emotional engagement when iPads were used, but little to no increase was evident in behavioral engagement. Rowell (2004) conducted a study of mobile technology in the social studies classroom. This study focused on the attitudinal shift among tenth graders when m-learning was implemented into the classroom setting. Results linked using mobile technology to significantly improved attitudes and levels of achievement but did not find an improvement in the overall attitude of the subject. Students in Bloemsma's study also

> reported being most engaged in activities which tapped into the Redefinition and Modification categories of Puentedura's SAMR (Substitution, Augmentation, Modification, and Redefinition) Model. A majority of the students desired more frequent use of iPads and stated that they wished their teachers had been better trained how to best use the iPad in the classroom. (p. xii)

This goes back to what was stated in an earlier section – it is essential, for successful mobile technology implementation, for teachers to be well-prepared prior to including iDevices into classrooms.

Feltman (2013) determined that students exhibited positive perceptions about learning when provided the use of interactive technology. "They quickly become creators of content rather than merely consumers" (Ensor, 2012, p. 193). De Abreu (2010) acknowledged digital media literacy as playing a role in helping students analytically determine online facts versus opinions or untrue statements. This is a highly important skill in today's age of *Googling it* to find answers to research questions. In a

study based on student and teacher opinions of the 1:1 initiative, John Carroll University professors Storz and Hoffman (2013) stated mobile learning in the classroom allows easy communication with the teacher at any time and showed learning benefits at various student ability levels but reported endless opportunities to communicate for social purposes. In their study at a Midwestern urban middle school, 47 students and eight teachers were interviewed before and after the 1:1 environment was implemented. They also pointed out that the time students spent socializing instead of learning could be difficult to monitor, adding more strain to the role of the teacher. Without proper implementation strategies, educational institutions may be setting students up for distraction when implementing mobile technologies in the classroom.

Further, Crichton et al. (2012) suggested students had less resentment toward devices used in the classroom when they were tied to a specific objective, such as reading class material, checking spelling, or conducting online research. In some classroom settings, students may be required to perform all of these tasks with one specific assignment. Transitioning from one source to another can be disruptive and distracting for students. When they go from one to another, they are tempted to socialize, etc. when mobile technology is present (Terras & Ramsay, 2012). This may lead to student frustration if they get off task and lose class time during an assignment. It also may lead to disciplinary problems if teachers catch students exhibiting off-task behaviors. Although most students in Feltman's (2013) study claimed they believed activities with an interactive component (as opposed to a traditional setting) aided in understanding, making real world connections, and thinking skills, they did not feel the activities were helpful with test material.

The benefits often seem to outweigh the drawbacks of utilizing technology in the classroom. Two hundred thirty-one college students were subjects of a structural equation modeling analysis in Abulibdeh and Hassan's study in 2011. The study aimed "to validate a model of student interactions, information technology self-efficacy and student achievement [among] undergraduate students" at the University of Sharjah (Abulibdeh & Hassan, 2011, p. 1014). Researchers used final grades, digital documents, digital logs, and a student technology self-efficacy survey to gather data. The research reported relationships between student technology use and self-efficacy, achievement, and interactions. "The present research indicates that student-content interaction makes the highest contribution to the e-learning interactions" (Abulibdeh & Hassan, 2011, p. 1021). They also reported self-efficacy leads to achievement and interactions in the mobile learning atmosphere. If the content is more easily understood due to electronic devices, students and teachers both have the opportunity to benefit greatly from adding this component to the existing curriculum. In Rossing's (2012) study, the mobile learning environment was easier, more engaging, and more stimulating than the traditional teacher-led classroom environment, according to student reports. When using the iPads in the classroom, Peluso (2012) examined what makes mobile technology relevant in the classroom and how students are using the devices with a review of literature available on the subject. Based on the compilation of facts presented, this article proposes students do some critical thinking about how to use them and what apps should be used for what purposes. This, combined with teacher preparedness, may progress current mobile technology use in the classroom to a much more meaningful practice.

Pros and Cons of Mobile Technology Inclusion

There is little research dealing with particulars about how to implement a mobile technology initiative, the end results (positive or negative) of these initiatives, and information about what happened after the initiative was implemented. Most of what is out there deals with monetary justification and purchasing information (Benton, 2012). This is unfortunate for schools looking to jump on the bandwagon because they may do so when they are unprepared (Peluso, 2012). According to Livingstone (2012), there is a lot of debate on the topic. The benefits of having a more interactive classroom are offered with technology, but there is no way to determine if students are actually learning more because of this.

Some studies show conflicting results as to whether mobile technology devices are positive or negative for the classroom setting. Crichton et al. (2012) found elementary and junior high school students and teachers to be much more accepting of the practice, whereas high school students and teachers were not as willing and had difficulty determining ways to implement the devices educationally. Feltman (2013) found no significantly different quantitative results between the students using mobile technology and the students learning through traditional classroom methods regarding student achievement; however, qualitative results revealed more positive results regarding engagement, critical thinking, and positive student perceptions among the group experiencing the technological environment. These increases may lead to involvement, knowledge attainment, and productivity in the classroom environment if practiced regularly and correctly (Feltman, 2013).

Crichton et al. (2012) found, "the high school students and teacher were more critical, as both appeared to struggle to find the educational uses for the devices" in their

study (p. 23). Increased isolation when using online collaboration (Huang et al., 2010), waning novelty a short time after implementation – decreasing appropriate use of the devices (Rossing, 2012), and students struggling to learn the technology due to insufficient directives (Rossing, 2012) were other reasons why school, administrator, teacher, and student resistance may exist. Again, along with proper implementation techniques and educationally sound purposes, mobile technology has the potential to be a positive force.

Students and teachers included in Storz and Hoffman's (2013) study reported students are able to learn in various, more creative ways when lessons were not too specific. Rossing (2012) noted collaboration and data gathering become possible, desirable, and practical with mobile devices. Lam and Tong (2012), in their quest to determine whether teachers should promote the use of student technology in the classroom, used two teachers-in-training to conduct a free-use classroom (where students were allowed to use technology as they wished) and a more guided classroom where students were more specifically directed on how to use devices. They concluded that technology was a good motivator for learning in the postsecondary classroom when the teacher was constantly involved and visible. Kay and Lauricella (2011), in their study of the benefits and challenges mobile learning presents in the college classroom, found mobile devices beneficial for note taking, academic activities, accessing resources, and communication, and they also found a tie to student success. Student engagement increased when using mobile devices in Bebell and O'Dwyer's (2010) analysis of four empirical studies based on using technology in the classroom. They focused on emergent themes and determined what led to increased student use, engagement, and success, and teacher willingness to implement educational technology. Bebell and O'Dwyer also

found significant gains in ELA in students during their second year of 1:1 implementation. Ensor (2012) stated, "Learning became a shared experience: one in which students and adults discover together" (p. 193). According to Hutchison et al. (2012), iPads "can support individual readers' text comprehension and potentially engage struggling readers" (p. 16). These facts cannot be ignored when considering the potential for mobile devices as tools in the classroom. Mobile technology requires thoughtful incorporation and ongoing inquiry about what's working and what's not (Rossing, 2012). Recommendations for incorporating technology, according to Rossing (2012), include integrating technology as more than a tool, identifying new and shifting learning outcomes, adapting to new literacies, and balancing liberal education and technological literacy.

With the proper preparation and classroom environment, it is undeniable that mobile technology devices can be beneficial tools in the classroom environment; however, prior to implementation, teachers need to be prepared and confident and students need to have a clear purpose for the device and view it as a helpful resource.

Self-Efficacy

Self-efficacy, in various domains, has been suggested to be a predictor of human performance. In Bandura et al.'s (2001) study, students were analyzed for their perceived academic self-efficacy, perceived social self-efficacy, and perceived self-regulatory efficacy using a five-point scale. Researchers "examined the role of the three major domains of perceived personal efficacy that have been verified cross-culturally" (Bandura et al., 2001, p. 126). Perceived academic, social, and self-regulatory efficacy among students was previously directly correlated to progressive success (Bandura et al., 2001, p. 126). The article stated, "among the mechanisms of human agency, none is more focal

or pervasive than beliefs of personal efficacy . . . . In social cognitive theory, the self-efficacy belief system is the foundation of human motivation, well-being, and personal accomplishments" (Bandura et al., 2001, p. 125). Further, the research stated that if people do not possess confidence that their actions will lead to desired results, they will fall to adversity much more easily (Bandura et al., 2001, p. 125). This group found self-efficacy and resiliency imperative when working toward an outcome (Bandura et al., 2001, p. 125). "Perceived learning capability affects how people approach the mastery of new challenges" (Bandura et al., 2001, p. 126). In academic or social situations, self-efficacy may determine how a person learns or reacts to certain situations.

In the same study, 564 sixth graders were tested and then retested in the eighth grade (Bandura et al., 2001). Researchers used the sixth-grade behaviors to determine what transgressive behaviors they would have in the eighth grade. They measured perceived self-efficacy in academic, social (working with others, etc.), and self-regulatory (resisting peer pressure, etc.) domains. They also measured levels of prosocialness (how they share, console, cooperate, help, etc.), rumination self-arousal (hostility, likeliness to retaliate, etc.), irascibility (quickness to anger, testiness, etc.), and moral disengagement (likeliness to cheat, lie, use drugs, etc.). The surveys reported, "prosocialness, as reflected in cooperativeness, helpfulness, sharing, and [empathetic behavior], is one such factor that helps to promote advantageous self-development" (Bandura et al., 2001, p. 127). "The male adolescents had lower perceived academic and self-regulatory efficacy, were more prone to disengage moral self-sanctions from detrimental conduct, were quicker to rouse themselves to anger through hostile rumination, and were less prosocially oriented" (Bandura et al., 2001, p. 131). Academic and self-regulatory efficacy was linked to less transgressive behaviors, less demoralizing behaviors, and

increased prosocialness. The more ruminative the activity, the more transgressiveness appeared. Finally, moral disengagement over time led to increased transgressive behaviors. These results may indicate positive self-efficacy beliefs being more imperative to boys and the importance of early self-efficacy establishment. Academic and social confidence can lead to less transgressive behaviors. This is vital in the classroom setting where students are held to behavioral standards, which can impede the educational process when not fulfilled. Inquiring about student self-efficacy may help pinpoint areas where students are feeling less than confident and give educators information about how to increase that confidence when implementing new initiatives (i.e., technology) in the classroom.

In 1964, Bandura and Kupers conducted a study of 160 boys and girls ages seven to nine. The students were split into three groups and in each there were two adult models (one male and one female) and two 9-year-old children who also served as models. One of the groups had models who were strongly self-recognizing (positive and negative), one had leaders who were more mildly self-recognizing, and the third were not self-recognizing at all. The models completed an individual bowling task, and the test subjects were present to observe the models' reactions. M&Ms were available for all at any time and were used to determine how the students rewarded themselves when it was their turn. The purpose of the study was to see how patterns of self-reinforcement transferred through modeling. The study "[provides] some evidence that the behavior of models is influential in transmitting self-control in the utilization of readily available rewarding resources" (Bandura & Kupers, 1964, p. 5). Results found young kids reflected their models in their behaviors, leading one to the conclusion that kids pick up on the behaviors of their leaders. Self-efficacy runs deep in this study. Who people

surround themselves with may play a role in how confident they feel and act upon their own performances. This also may be true for the classroom environment: If the teacher models him/herself as a learner and remains confident in the classroom when introducing new material, this may transmit to his/her students.

Griggs et al. (2013) conducted a study on the impact of gender on math and science anxiety among students. They tested a particular Social and Emotional Learning (SEL) practice and its relation to student self-efficacy in math and science. They gathered data from 1,651 fifth graders and 62 teachers using self-efficacy scales, anxiety assessments, and surveys. In terms of self-efficacy, the study found that it "forecasts student persistence and achievement in challenging subjects" (Griggs et al., 2013, p. 360). They found that low levels of self-efficacy were directly related to high anxiety. "Strong self-efficacy beliefs promote students' achievement in math and science" (Griggs et al., 2013, p. 369). It seems if students are anxious about using technology, they may be less motivated to use it in the classroom setting.

Frank Pajares, author and former professor at Emory University, created a manuscript regarding self-efficacy and its past, present, and future. It is a very helpful aid and timeline which offers many additional resources to help convey self-efficacy and its importance in an individual's life. In regards to self-efficacy in the academic context, Pajares (2002a) offered a wide variety of explanations ranging from Bandura's thoughts to his own conclusions. On this particular website, he offered the following insight regarding personal self-efficacy beliefs:

- The beliefs (call them cognitions, if you like) that individuals create and develop and hold to be true about themselves form the very foundation of human agency and are vital forces in their success or failure in all endeavors

(school).

- For Bandura, a psychology without "mind" could not aspire to explain the complexities of human functioning, for it is by looking into their own conscious minds that people make sense of their own psychological processes. To predict how human behavior is influenced by environmental outcomes, it is critical to understand how one cognitively processes and interprets those outcomes.
- Consequently, how people behave can often be better predicted by their beliefs about their capabilities than by what they are actually capable of accomplishing. This does not mean that people can accomplish tasks beyond their capabilities simply by believing that they can, for competent functioning requires harmony between self-beliefs on the one hand and possessed skills and knowledge on the other. Rather, it means that self-perceptions of capability help determine what individuals do with the knowledge and skills they have. More important, self-efficacy beliefs are critical determinants of how well knowledge and skill are acquired in the first place.
- A strong sense of efficacy enhances human accomplishment and personal well-being in countless ways.
    - People with a strong sense of personal competence approach difficult tasks as challenges to be mastered rather than as threats to be avoided.
    - They have greater intrinsic interest and deep engrossment in activities, set themselves challenging goals and maintain strong commitment to them, and heighten and sustain their efforts in the face of failure.

- Moreover, they more quickly recover their sense of efficacy after failures or setbacks, and attribute failure to insufficient effort or deficient knowledge and skills, which are acquirable.
- Conversely, people with low self-efficacy may believe that things are tougher than they really are, a belief that fosters stress, depression, and a narrow vision of how best to solve a problem.
- High self-efficacy, on the other hand, helps create feelings of serenity in approaching difficult tasks and activities.
- Efficacy beliefs vary in level, strength, and generality, and these dimensions prove important in determining appropriate measurement. (Pajares, 2002a, n.p.)

Pajares (2002a) suggested that when someone has inflated efficacy judgments, this may more often lead them to increased levels of achievement; however, when efficacy judgments are too high, people may not give as much effort. He stated that Bandura believed

> individuals create and develop self-perceptions of capability that become instrumental to the goals they pursue and to the control they are able to exercise over their environments . . . . According to Bandura, how people behave can often be better predicted by the beliefs they hold about their own capabilities than by what they are actually capable of accomplishing, for these self-perceptions, which he called self-efficacy beliefs help determine what individuals do with the knowledge and skills they have. (Pajares, 2002a, n.p.)

Therefore, when presented with appropriately challenging tasks, the higher self-efficacy levels students have in regards to technology, the more likely they are to achieve

proficiency in using them as educational tools.

Pajares (2002a) stated that when people face adversity, they must believe in their own ability to overcome; otherwise, they have less will to persist and put forth great effort. The article stated,

> The contention that self-efficacy beliefs are a critical ingredient in human functioning is consistent with the view of many theorists and philosophers who have argued that the potent affective, evaluative, and episodic nature of beliefs make them a filter through which new phenomena are interpreted (e.g., Aristotle, James, Dewey, Kant, Maslow, Nisbett and Ross, Rokeach). (Pajares, 2002b, n.p.)

Self-efficacy beliefs can establish the amount of effort, resiliency, and perseverance a person will display. How they feel a situation will end is not the same as self-efficacy. If someone sees clearly a consequence, this may affect his/her behaviors. Usually, a person's self-efficacy beliefs can indicate unsurprising outcomes. For example, if someone has low confidence in his/her ability to accomplish a task, one can expect low quality achievement. They can also improve happiness and success. This may be a result of the fact that self-efficacy beliefs may lead a person to make certain life decisions. Self-efficacy beliefs, according to Pajares (2002b) are determined by previous experiences, social persuasions (when someone believes what others think of them), vicarious experiences (watching others), and somatic (physical) and emotional states. Pajares (2002b) stated in the same article,

> Self-efficacy beliefs also influence an individual's thought patterns and emotional reactions. High self-efficacy helps create feelings of serenity in approaching difficult tasks and activities. Conversely, people with low self-efficacy may believe that things are tougher than they really are, a belief that fosters anxiety,

stress, depression, and a narrow vision of how best to solve a problem. (n.p.) If students are given the chance to voice their concerns regarding what inhibits their self-efficacy when using technology for educational purposes, educators may determine how to decrease stress levels and resistance to utilizing the devices in a confident and productive manner.

Riding and Rayner (2001) made a clear point when referring to a person's reaction to new and uncertain tasks. When this is the case, what the person has experienced in the past plays no role. Self-efficacy beliefs are not a factor in the decision one makes or the outcomes they experience when the task is too vague and unclear. In an academic situation, a student may lose persistence if he is presented with a task that is too difficult or not enough instruction is given (Riding & Rayner, 2001). Therefore, it is not only important that students feel comfortable using mobile learning devices, but it is equally important that teachers provide the devices to be utilized for appropriately challenging tasks. Again, the devices should be used as a teaching/learning tool, not as a replacement for what is already being taught.

In a study regarding self-efficacy beliefs in the areas of computer, information literacy, and scientific research, Tuncer (2013) analyzed whether or not the three affect each other in the educational setting. Prior to providing information regarding the study, Tuncer cited several descriptions of self-efficacy, including "The self-trust one person needs to feel when accomplishing a certain task that demands effort and patience" (p. 33) and how one answers the question "Am I capable of accomplishing this mission?" (p. 33). This particular study included 197 college students studying to be teachers. Data collection was conducted using a series of self-efficacy scales. The conclusions stated all three areas affected each other and Tuncer recommended they all be taught

simultaneously.

> Based on all these findings, it can be argued that parallel to the advancement of computer skills, information literacy skills of learners shall become further developed, hence, high learner-readiness level which is essential for scientific research skills shall be fulfilled in certain levels. (Tuncer, 2013, p. 38)

Tuncer challenged in what sequence educators should teach these skills. If self-efficacy plays a role in various areas of research education, it may be difficult to determine which ones would be most beneficial for students to learn first. With literacy being implemented in all classrooms (except math) at the school involved in this study, it could be assumed iPads could play a significant role in research within most ninth-grade core subject classrooms. If one leads to another, a future study recommendation may be to determine the best order in which these should be taught.

It is quite clear, according to the studies above, how definitive self-efficacy beliefs can be when considering achievement or performance outcomes (Bandura et al., 2001). When students feel they can be successful, they will, in turn, be more successful than those who feel the opposite (Griggs et al., 2013). It is important for students to be appropriately challenged in order to keep attention from waning (Pajares, 2002a; Riding & Rayner, 2001). Also, in order for students to feel the highest levels of self-efficacy, it helps if they have competent teachers (Bandura & Kupers, 1964).

Mobile Learning and Self-Efficacy

Bandura (1994) described self-efficacy as people's beliefs about their capabilities to produce effects. When implementing a mobile learning initiative in a classroom, school, or district, it is important for teachers and students to have a sense of self-efficacy with that technology in order to be successful (Bandura & Kupers, 1964; Pajares, 2002b).

It has already been determined teachers should be comfortable with the technology in order to teach students to use it effectively and it should be seen as a tool, not a solution to low academic achievement. There is, however, little research relating student self-efficacy with mobile technology devices to successful implementation of the 1:1 classroom. Terras and Ramsay (2012) collaborated to create a literature review regarding using mobile Web 2.0 activities (such as social networking, wikis, and Twitter) in the classroom in order to combine formal and informal educational environments. They focused on the psychological challenges that impose themselves in a mobile learning environment utilizing Web 2.0 activities. With their research, Terras and Ramsay named five specific psychological challenges when incorporating Web 2.0 technology into the classroom:

- The context-dependent nature of memory – when individuals encode and recall information when in the same physiological, motivational or emotional state, memory is again superior.
- Human cognitive resources – noisy changing environments and the potential distractions posed by social media, etc.
- Distributed cognition and situated learning – learners continually construct and reorder and rearrange their understanding while they interact with their educational materials.
- Metacognition is essential for mobile learning – the ability to self-monitor and self-manage in mobile learning contexts will be crucial.
- Individual differences matter – technology should be used in an integrated way, and students must understand how and why technology can assist their

learning.

Educators in charge of implementing an iPad initiative can gather detailed information regarding how these psychological challenges impact students and strive to create solutions in order to motivate students to learn using technology.

Some studies examine the relationship between self-efficacy and behaviors regarding technology. The results from Yang's (2012) attitude and self-efficacy study of 58 second-year, Taiwanese, college students enrolled in an English class "showed that most students agreed that their motivation for English learning was enhanced and most of them had positive attitudes towards [mobile] learning" (p. 148). The study also concluded "students' computer self-efficacy and attitudes were core factors which affected the success of mobile learning" (p. 152). The key factors which lead to that self-efficacy are yet to be determined.

Joo, Bong, and Choi (2000), in their study of Korean junior high students and the impact of their self-efficacy on WBI, determined that "computer self-efficacy is one of the critical variables determining the success of [computer based instruction] CBI and [web based instruction] WBI" (p. 15). The results also "indicate that teachers, trainers, and instructional designers or WBI would benefit by being more attentive to students' percepts of efficacy" (Joo et al., 2000, p. 15). The more educators know about student self-efficacy with technology in the classroom, the greater their chance of a successful implementation. Joo et al. stated, "If teachers have such information when planning their instruction, they can consider allocating some of the instructional time and activities to strengthening the weaker skills" (p. 15). It is apparent some class time will be spent teaching students how to use new devices, but if educators knew where the weaknesses existed ahead of time, time could be better spent. Since self-efficacy undoubtedly plays a

part in student success, the more areas in which students feel confident in their abilities, the more likely mobile technology will be beneficial to student achievement.

Hsiao, Tu, and Chung (2012) believed "computer self-efficacy has been shown to play a significant role in an individual's decision to use computers" (p. 167). The greater the desire to utilize the iDevices in the classroom, the more motivated students may be to learn. They also believed "general computer self-efficacy may equip students to better assess their computer ability . . . [and] significantly influences computer use" (Hsiao et al., 2012, p. 174). "Learners with better support and guidance during learning are more likely to adopt confidence while learning, and a positive attitude toward the Internet. Therefore, computer self-efficacy is a greater predictor of computer usage than computer experience" (Hsiao et al., 2012, p. 174). Additionally, in their study, Hsiao et al. found the following to be true: "students in a positive social environment tend to possess higher levels of computer self-efficacy . . . [and] student self confidence in computer skills may affect their willingness to learn computer skills" (p. 174).

Bandura is one of the most well-known researchers of self-efficacy. His theories and conclusions on the subject directly relate to the possible success students may experience using technology in the classroom when they feel capable. Bandura (1977) stated, "cognitive processes mediate change but that cognitive events are induced and altered most readily by experience of mastery arising from effective performance" (p. 191). If students perceive themselves as mastering the use of mobile devices in the educational setting, they may have greater success using the technology to learn in various settings. In this 1977 study, Bandura set out "to explain and to predict psychological changes achieved by different modes of treatment" (p. 191). Bandura determined "psychological procedures, whatever their form, alter the level and strength

of self-efficacy" (p. 191). If mobile devices are used in different classes across the grade level, students will have more opportunities to build skills along with beliefs of their capabilities. There is a degree of variance in self-efficacy depending upon past experiences (Bandura, 1977). Therefore, naturally, students will all be on different levels when beginning new projects. However, "perceived self-efficacy proved to be a better predictor of behavior toward unfamiliar threats than did past performance" (Bandura, 1977, p. 211). If students go into the implementation of mobile devices in each particular class with a positive attitude and teachers help students feel as though they can be successful, the tool may be a positive resource regardless of how the devices have been used in the past. "People process, weigh and integrate diverse sources of information concerning their capability, and they regulate their choice behavior and effort expenditure accordingly" (Bandura, 1977, p. 212). This statement indicates if students feel they can be successful, they may be more likely to put forth the effort to be successful (Bandura, 1977).

The opposing findings from a study by Abulibdeh and Hassan (2011) did not find a "direct relationship between students' self-efficacy and students' academic achievement" (p. 1021). Abulibdeh and Hassan determined self-efficacy as "a poor predictor of [student] success" (p. 1019); however, when regarding e-learning experiences, their "results revealed a significant relationship between students' self-efficacy and students' academic achievement" (p. 1019). Mobile learning devices alter the classroom environment drastically and can impact how students perform when they feel confident using the devices.

Castagnaro (2012) found a link between self-concept and self-efficacy in her mixed-methods study of sixth graders and the link between their technology use and self-

efficacy. This study found significant, positive correlations between the use of mobile technology outside of class and using the devices as a math and writing tool during class time. With the number of students using personal devices on their own time, this is good news for schools incorporating mobile learning.

Research Questions

In an attempt to decrease achievement gaps among its students, a South Carolina school district has decided to adopt the iPad initiative, allowing 1:1 access to iPads in the ninth-grade classrooms in one of the three high schools. Research shows that when someone perceives high self-efficacy in a particular environment, his/her chance for success increases (Griggs et al., 2013). The questions in this study regard students and their perceived self-efficacy in the 1:1 classroom. Since this initiative will most likely be adopted by the other two high schools in the district, questions requested feedback based on the implementation process and what changes would have helped improve the process and allow students more self-efficacy.

1. What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
2. What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
3. According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting?

Summary

In conclusion, the apparent themes in the studies found in this review of literature remain the same. First, teachers should be well prepared for iDevice implementation in the classroom via an abundance of PD far prior to implementing any mobile technology initiative. This will prevent confusion and frustration among teachers and students. Second, students must see an educational objective to utilizing the device in class in order to find value in its existence in this setting. All stakeholders should be involved with setting 1:1 initiative goals, and that includes students (Smolin & Lawless, 2011). When the purpose for using the device is clear, students may be much more motivated and on-task. Also, the mobile technology device should be used as a means to teach students necessary information directly related to the subject assessments and curriculum. If this does not occur, the initiative may be deemed out of place or useless. Finally, the more confidence a student has in his/her ability to use the mobile device, the more successful he/she may be with using the device in an educational setting. Although past experience plays a role in self-efficacy, or the perception of one's abilities, this is not the case with e-learning. This means mobile learning may be the one resource incorporated into the classroom environment that has little effect on what a student has been exposed to before. "Mobile technology in a learning environment does not change the essential aspects of how people learn" (Franklin, 2011, p. 264). In a study by Akour (2010) examining what causes students to desire the use of technology in the classroom, it was determined that past use of mobile technology in the classroom increased student intentions to use and perceptions of usefulness. When students saw the tools as useful in the learning process, they usually were more accepting of the technology in the classroom. The most significant indicators of acceptance of technology in the learning process were student

readiness and extrinsic influence (Akour, 2010). If students begin creating self-efficacy with technology during high, middle, or even elementary school, they may be more determined and comfortable using technology when they are in college or later as an adult. With the apparent challenges students face when incorporating technology into the classroom, more emphasis could be put on learning how to overcome these to provide more opportunities to increase technology self-efficacy for students (Parajes, 2002). Studies have shown that mobile learning behaviors in the classroom and the desire to use technology in an educational setting are directly correlated to self-efficacy levels when using the technology, but the factors that contribute to increasing student self-efficacy are unknown (Yang, 2012). Put simply, based on the theory of self-efficacy, students are going to be more motivated and feel more successful in the classroom when they feel confident using the devices and the use of the devices has a purpose (Bandura, 1977). The goal of this study is to determine what factors lead to self-efficacy when students use technology in the educational setting.

Chapter 3: Methodology

The 1:1 iPad initiative was implemented during the 2013-2014 school year in a suburban South Carolina school district to allow students in Grades 3-8 to access their own personal mobile learning devices in the classroom. The initiative was piloted by ninth-grade students at one of the three high schools in the district. This study focused on the self-efficacy beliefs among those ninth-grade students and inquired what students felt could have been different in order to increase their personal self-efficacy beliefs in this situation after 1 school year of implementation.

This particular study is categorized as a case study. Creswell (2009) defined a case study as "a strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals" (p. 13). With this study, individuals, programs, activities, and processes were analyzed; however, the focus will remain on the self-efficacy of the students. Creswell stated that a case study should be used when the researcher is trying to analyze "a process consisting of a series of steps that form a sequence of activities" (p. 465). The series of steps mentioned here would refer to the iPad initiative implementation and the results from that sequence of activities. During the sequence of activities, the researcher sought to determine what worked and what did not, how students' self-efficacy levels were impacted, and what could be changed to make it a more efficient process to allow greater success among students.

Participants

The participants of this study consisted of 372 ninth-grade students attending a high school in South Carolina, 10 of their teachers, and two administrators involved in the initiative. All ninth-grade students enrolled in the school were introduced to the study and asked to take a parent permission form home to be signed in order to participate.

Consent forms were distributed to all teachers, administrators, and parents of all students, and only those who returned a form were included in the study. Consent forms explained that all who participated in the survey had the option to decline or withdraw at any time (see Appendices A and B for the consent forms). Eighty-one ninth graders returned the parent permission form and were surveyed on their self-efficacy beliefs regarding technology use in the educational setting. All teachers and administrators submitted a permission form allowing their responses to be used for analysis (see Appendix C for teacher survey questions and Appendix D for administrator survey questions). Following analysis of the student survey results, a student sample of eight was chosen, via purposeful sampling, to participate in focus group questioning (see Appendix E for focus group questions). The questions for the focus group were chosen based on the answers to the surveys. Another three students from the original 81 were randomly chosen to participate in interviews (see Appendix F for interview questions). The interview questions were created based on the focus group responses. The group surveyed consisted of 47 White, 30 African-American, one Hispanic, one Native American, and two other race students. Fifty were females, and 31 were males. All students were between the ages of 14 and 16. This sample was chosen for two reasons. First, the larger the group of test subjects, the more accurate the results. Creswell (2009) stated, "a high response rate [to surveys] creates a stronger claim in generalizing results from the sample to the population" (p. 390). Second, all students in the ninth grade experienced the iPad initiative in their ninth-grade core classes (this excludes some electives), and as many as possible were considered when reviewing results. Students who answered all survey questions the same were omitted. Wave analysis (checking survey responses for overly positive or negative responses and omitting questionable response forms) can be useful to

eliminate biased survey responses (Creswell, 2009). All other student responses were included in the results and data analysis of the survey findings (see Appendix G for student survey questions). The 81 students who completed the initial student survey were divided into four groups by race (White and other) and gender (male and female). Two students were chosen randomly from each gender and each ethnic group, which created a focus group consisting of two Caucasian boys, two Caucasian girls, and two boys and two girls of other ethnicities. These eight students were pulled from class to participate. This is referred to as purposeful sampling (Creswell, 2009). According to Creswell, variables such as these can help keep the groups a quality and nonbiased sample. In this emerging design component (grouping after some data have been collected), purposeful sampling in the opportunistic form allowed the researcher to gather data from various achievement levels to gain more complex feedback (Creswell, 2009). A colleague of the researcher (who did not know any of the participants) led the focus groups. The focus group conductor recently graduated with her doctoral degree from the same university as the researcher and is very educated on research procedures. They met several times to ensure the focus groups would be conducted properly and appropriately. See Appendix H for research protocols, along with a link to the student survey questions. The focus group students were asked questions to gather more data relating to self-efficacy levels of students when using iPads in the classroom, what factors led to their self-efficacy (Research Question 2), which areas need improvements (Research Question 3), and what they would change about the iPad program (Research Question 3). These questions of the focus group session can be found in Appendix E. After focus groups were completed and data were compiled, three different students from the 81 survey participants were chosen randomly to participate in a four-question interview session. These three students

were asked questions based on what led to their positive responses regarding self-efficacy, how comfortable they were completing assignments using the iPads after their teachers gave them instructions, how prepared they were to use the iPads this year, what could have helped them to be better prepared to use the iPads this year, and what administration could have done to help more with the initiative.

Instruments

The cross-sectional survey instrument used in this student-focused portion of the study encompasses questions pertaining to self-efficacy regarding technology use in the classroom at one point in time (after 1 year of 1:1 implementation). Students, teachers, and administrators were all surveyed to gather as much data as possible regarding the implementation process. Participation of all survey subjects was voluntary, and parent permission was required for students to participate. Several student and administrator surveys were considered, but none met the needs of this research project. The researcher created the questions for the student and administrator surveys based on the iPad initiative implementation at this school. The teacher survey was used previously in another study by a different researcher. Participation at all levels was voluntary.

The student survey was compiled by the researcher and shared with five teachers in the school who were technology leaders and involved in the iPad initiative. All teachers included in this group were members of a technology cohort through the district and designated as the specialists regarding the 1:1 initiative in this particular school. All teachers gave feedback as to changes that should be made to the student survey items, and the researcher took those changes into consideration. Also, a class of 13 eleventh-grade students was chosen to analyze the survey and give feedback regarding changes that should be made in order to gather the necessary data. The researcher met with the

students, explained the research project and the role of the survey, and provided the students with paper to submit anonymous tips. The meeting lasted about an hour, and it was an open forum discussion. Most students posed questions and suggestions to allow more clarity and depth to the survey items. Two pairs of the questions were redundant, and both students and teachers suggested one from each pair be removed. From the students' points of view, several questions could have been worded differently; for example, instead of "Teachers can help me use the iPad," they suggested changing it to, "I feel like my teachers are qualified to use the iPads" and instead of "I can attach a person to a document using Google Drive," it was suggested to be written, "I can share a document with someone using Google Drive." The students also suggested adding questions specifically inquiring about each subject and whether students felt comfortable using the iPads in those classes. One teacher suggested the option of "Neutral" be added to the "I don't know" response to open the answer choices up a little. After consideration, these are some of the suggested changes applied to the original survey. After validating the survey with teachers and students, two district office employees who specialize in utilizing technology in the classroom were also given the student survey questions and asked to consider validity. Both specialists were given the research questions and purpose of the study along with the survey questions to analyze. They both responded with a favorable reply. One specialist suggested the incorporation of the International Society for Technology in Education (ISTE) standards for implementing technology into the classroom, but they were too broad for this particular study.

The eleventh-grade students mentioned above were also asked to take the survey based on their own experiences with technology this year (several of their teachers have classroom sets of iPads) to test for reliability of the survey items. The results were coded

and analyzed using SPSS and the Cronbach's Alpha score was .847. A score of .7 is needed for the survey items in order to prove an acceptable level of reliability (UCLA Office of Information Technology, 2014). Each question ranged from .83 to .859 regarding reliability, which indicates the tool items are highly reliable. See Appendix I for Cronbach's Alpha data regarding the eleventh-grade student results.

Teacher survey questions were acquired from a survey administered to middle school teachers in a North Carolina district following their own iPad initiative implementation (see Appendix J for permission email). A principal from West Caldwell Middle School created and established validity and reliability in the tool he used to gather data from teachers in his school. He gave the researcher permission to utilize these survey items. The survey was not altered. The questions focused on teacher confidence in various areas of using technology during instruction.

The researcher created the administrator survey questions based on the data needs for this study. These questions were chosen in order to gather the data needed to complete the research. The questions focused on the implementation process, PD, and what was observed in the classrooms regarding technology. This information provided more insight into how the implementation process worked outside of the classroom and perceived goings on from an outsider's perspective. Data collected from both teachers and administrators were analyzed along with data from students to determine areas of need and success regarding implementing technology into the classroom.

Students, teachers, and administrators were informed of the purpose of the study and the purpose of data collection prior to completing the surveys. These steps helped increase the validity of the student survey, ensured the reliability of student survey items, and helped gather more valuable data regarding the iPad initiative implementation.

Creswell (2009) stated that the quality of survey questions is important because "using good questions helps participants feel that they understand the question and can provide meaningful answers" (p. 387). The surveys used in this study had all the elements Creswell suggested be included for an overall soundly constructed questionnaire: demographic data (when needed) presented at the beginning of the questionnaire (in order to commit the respondent to completing the survey); the use of various forms of closed-ended questions; inclusion of open-ended questions for additional feedback; the use of one scale, strongly agree to strongly disagree; and instructions at the end when students finish.

The administrator and teacher surveys helped the researcher understand the viewpoint of the technology leaders regarding the iPad initiative rollout this year. The student survey questions led the researcher to answer the research questions by honing in on how comfortable students felt using the iPads in an educational setting. Data gathered from all surveys showed inconsistencies and/or flow among the various levels of implementation. Some questions were included in the student survey to gather data for discussion purposes (i.e., focus groups and interviews). For example, the question focusing on social media – if students feel comfortable using social media on the iPads but do not feel comfortable using them in their classes, maybe they are being used incorrectly and not monitored closely enough. The student survey results were used to answer Research Question 1 (see below). Based on the data collected by the survey, the focus group questions (sample questions, created prior to student survey administration, can be found in Appendix H) were determined to gather additional data. After the focus group was conducted and the data analyzed, students were chosen to participate in interviews to gather more detailed data. Interview and focus group data were gathered to

answer Research Questions 2 and 3. Creswell (2009) stated focus group interviews are useful when time to collect data is limited and when the subjects may be hesitant to answer questions individually (all subjects were youngsters). The research questions for this study were as follows:

1. What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
2. What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
3. According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting?

Procedures

Design. This study is a mixed-methods design. This is a study of human behavior and motivation. Creswell (2009) suggested, "the problems addressed by social and health science researchers are complex, and the use of either quantitative or qualitative approaches by themselves is inadequate to address this complexity" (p. 203). Creswell defined this methodology as having both qualitative and quantitative aspects. Creswell stated this method "involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study" (p. 230). The quantitative data were derived from the survey findings and the qualitative data were from student, teacher, and administrator input relating to the surveys, interviews, and focus groups. All parties were surveyed and questioned in April-June 2014. This allowed students to complete the majority of the school year before questions were

answered about the initiative, while allowing the researcher to complete analysis prior to the other two high schools implementing the program the following year. Upon data analysis from the survey results, focus group questions were determined and subjects were decided. Interviewees and more detailed interview questions were also determined based upon student results from the survey items and focus group data. The triangulation design is explained below. This image is included to allow visualization of both quantitative and qualitative components of the mixed-methods design.

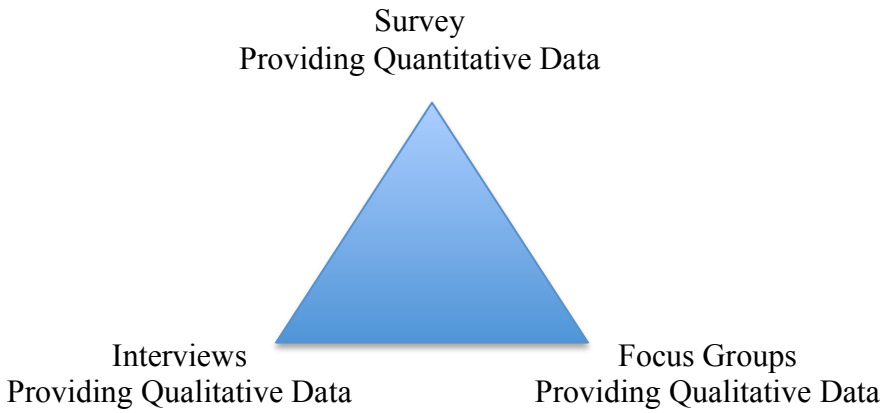


Figure. Mixed-Methods Design – Qualitative and Quantitative Components of the Study.

Focus group protocols are included in Appendix H and should include encouraging students to talk and demanding they take turns speaking in order to keep transcribing simple and thorough (Creswell, 2009). Interviews were videotaped in order to maintain accuracy, and possible probing questions (sub-questions) were included to be used if/when clarification or further information was needed (Creswell, 2009). Both focus groups and interviews were held in a quiet, comfortable, safe, and professional environment to avoid interruptions and distractions (Creswell, 2009).

Data analysis. Survey items utilize the Likert scale to determine where students lie in terms of their self-efficacy beliefs in regards to the 1:1 initiative after 1 school year of implementation. Creswell (2009) stated this scale is popular due to its "theoretically equal intervals among responses" (p. 167). The item answer choices varied from "strongly agree" to "strongly disagree" to gain insight from students regarding their self-efficacy beliefs when using technology in an educational setting. Google Forms were used to administer the surveys, and results were received using Google Drive. Cronbach's Alpha was utilized to test internal consistency and reliability of survey results prior to the ninth graders taking the survey. Data were analyzed from these results to create focus group questions. After focus group sessions were conducted, data were coded and interview questions were determined. When focus groups and interviews had concluded, the data were transcribed and coded for themes. The focus group and interview leader was coached by the researcher, and the leader also used protocols found in an article by University of Minnesota professor and Evaluation Leader Richard Krueger (2002). The article offered information pertaining to the environment, tools, skills, and steps necessary for a successful focus group session and also provided examples and tips. Creswell was helpful to point out several mistakes interviewers sometimes make and the importance of avoiding them (for example, asking the questions out of order and having preconceived notions about how subjects will answer questions). The interviewer was also equipped with an interview guide including the focus questions in the order they should be asked to help reduce the chance of bias during the process (Creswell, 2009, p. 406).

The researcher used scoring data to determine how confident teachers were in their abilities to implement the iPads in their classrooms. This particular study required

an interval scale where teachers were assigned a number based on how they answered each question (Creswell, 2009, p. 175). Teachers scored a 1 for choosing Strongly Disagree as their response, a 2 for Disagree, a 3 for Neither Agree nor Disagree, a 4 for Agree, and a 5 for Strongly Disagree. The researcher used the combined score for each teacher to determine a Confidence Level regarding his/her self-efficacy when using the iPads during instruction. The scores ranged from 21 (lowest) to 105 (highest). This helped the researcher analyze how confident teachers were with regard to how many years of experience they had acquired. Creswell (2009) stated a single-item score as described above, "provide[s] a detailed analysis of each person's response to each question" (p. 177). Creswell suggested that after collecting data and preparing scores, analysis is in order to relate the findings to the research questions. For this study, detailed analysis was not necessary since the focus was on student feedback; however, the scoring data were very helpful to the researcher when comparing the Confidence Levels to years of experience.

Limitations

Limitations to this study include aspects that were beyond the researcher's control. Student fidelity of implementation when answering the questions was difficult to ensure for several reasons. First, student comprehension of the survey items may have been limited. The language used in the survey was age-appropriate and nonbiased regarding gender, age, race, ethnicity, disability, or sexual orientation. Second, survey items were created as fairly as possible, but some students may not have taken the time needed to read, question, and ponder answer choices before submitting their input. Since the students answered the survey items anonymously, the researcher was the administrator. Surveys with the same answer for all items were omitted from the study.

Since this study was subjective, student opinions determined the results. If students do not enjoy school, are not having a good day, or do not care for technology, their answers may have been determined based on those feelings. The administrator prompted students to answer the questions without these biases to help alleviate this problem.

During the interviews and focus groups, an adult who was not closely tied to ninth-grade students or technology administered the meetings. This hopefully reduced the number of students trying to impress the researcher since she works directly with them in the classroom and with the 1:1 initiative. There were technical difficulties with the video camera during the interviews, so the researcher had to conduct the interviews again herself in order to record the responses of the students. The researcher did know two of the three interview participants but had a positive relationship with both, so the results may or may not have been affected.

These limitations may have affected the data that were gathered with this study, but the goal of this process is essentially to gather personal opinions from students. The researcher had been a teacher to most of the students involved and talked to them about the study and its purpose prior to data collection. Since three methods of data collection were utilized, the research should have yielded legitimately valid and reliable results. The results were not falsified or fraudulent in any way.

Delimitations

Strictly ninth-grade students were used as subjects in this study because they were the only students in the school involved in the initiative with all core classes. This school was chosen for the same reason – it was the only school in the district implementing a true 1:1 educational environment for all students in the ninth grade. The researcher chose not to randomly sample for interviews or focus groups in order to represent all student

stakeholders involved in the initiative.

Summary

After gaining parent permission, the researcher gathered data from a large sample of the ninth-grade students in one high school regarding self-efficacy when using technology in the educational setting after 1 year of the 1:1 initiative implementation. Based on the findings from the student survey data analysis, focus group and interview questions were formed to gather data regarding what improvements could have been made to the 1:1 implementation process according to the students involved in the initiative. Upon completion of transcription and coding from the focus group sessions, the researcher then created questions and conducted interviews to gather more data from students regarding what changes could have been made to improve student self-efficacy and create a smoother implementation of the 1:1 initiative. These data were transcribed and coded. At the same time, the researcher gathered feedback from teachers and administrators regarding the 1:1 initiative implementation. All information from students, teachers, and administrators led the researcher to the results reported and recommendations for future implementation attempts and further studies.

Chapter 4: Results

Overview

Incorporating technology into the classroom has been steadily increasing in recent years in order to hopefully motivate students and decrease the achievement gap (Ahmed Atta, 2012; Barrow et al., 2007; Bloemsma, 2013; Castagnaro, 2012; Crichton et al., 2012; De Abreu, 2010; Franklin, 2011; Huang et al., 2010; Kay & Lauricella, 2011; Lam & Tong, 2012; Livingston, 2012; Peluso, 2012; Peters, 2007; Rossing, 2012; Stortz & Hoffman, 2013; Terras & Ramsay, 2012; Vu, 2013). There is little data available based on the factors which increase and/or decrease student self-efficacy with regard to introducing educational technology. In this chapter, data are presented that were used to answer the following questions:

1. What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
2. What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
3. According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting?

This chapter briefly describes the results of data collection that took place in May and June of the 2014 school year. The researcher explains the student survey results using a table and discussion. The results were coded into three subgroups, Skill Self-Efficacy, Self-Efficacy in the Classroom, and Perceived Teacher Self-Efficacy, in order to explain results and lead to focus group and interview data. The chapter then goes on to

analyze teacher and administrator survey responses and how they relate to the student data. Students in the focus group are referred to as students A-H, while students included in the interview sessions are named students 1-3. Tables and discussion are provided for teacher survey results and discussion only for administrator feedback. The summary at the end of this chapter briefly answers the research questions presented above.

Eighty-one ninth-grade students from a suburban high school in South Carolina were surveyed by the researcher to gather data regarding their self-efficacy when using iPads after 1 year of 1:1 technology implementation in their ninth-grade classes. All students were ensured their answers would stay anonymous and there would be no way for the researcher to trace their answers back to them. Ten ninth-grade teachers and two administrators involved in the initiative were also surveyed to gather feedback regarding the implementation in order to find correlating data and/or trends. The teachers were given a hard copy to answer by the researcher to turn in at their earliest convenience and the administrators were given their survey via email. After student survey results were analyzed, questions were created for a focus group session. This chapter discusses the findings from the surveys, focus group, and interviews.

Student Results

Eighty-one students (this is the number of students who returned parent permission forms) were pulled from their classes to complete the student survey regarding Research Questions 1 and 2 of this study. Students used a five-point Likert scale to respond to prompts regarding their self-efficacy levels using the iPads in various areas for educational purposes (see Appendix K for student survey results in graph form and Appendix L for student survey results in chart form).

Table 1 provides the questions and the number of students who responded on each

level of the Likert scale. The questions have been broken down into three themes, Skill Self-Efficiacy, Self-Efficacy in the Classroom, and Perceived Teacher Self-Efficacy. The questions in the table are numbered to represent their order presented in the survey and to aid in discussion. With the exception of the open-ended questions at the end of the survey, these questions focused mainly on gathering data regarding Research Questions 1 and 2.

Table 1

Student Survey Questions and Responses Breakdown by Theme

Skill Self-Efficacy	N	SA	A	IDK/N	D	SD
3. I can receive feedback about a document/project from a teacher and make the necessary changes using the iPad.	81	40	32	4	5	0
8. I feel comfortable taking tests/quizzes on the iPad.	81	37	21	11	8	4
9. I can use the iPad apps easily.	81	43	31	5	2	0
10. I can use educational apps on the iPad easily.	81	39	33	7	2	0
11. I can usually learn new functions on the iPad easily.	81	34	33	10	4	0
12. I feel comfortable using the Safari app on the iPad.	81	40	36	2	3	0
13. I can open multiple Safari web pages at one time on the iPad.	81	51	29	1	0	0
14. I can use the iPad in my classes to create projects.	81	44	30	6	0	1
16. I can contact a teacher using the iPad.	81	38	34	6	3	0
17. I can send an email using the iPad.	81	46	31	2	2	0
18. I can use Google Drive to create a new document on the iPad.	81	57	23	1	0	0
19. I can use the iPad to share a Google document with another person/teacher.	81	53	25	2	0	1
20. I can access social media (Facebook, Twitter, etc.) using the iPad.	81	28	31	11	7	4
21. I can use Edmodo on the iPad for my classes.	81	42	34	3	1	1
23. I can usually resolve problems with my iPad.	81	28	37	8	7	1
29. I believe having the iPad has made me more comfortable using technology.	81	38	27	12	3	1
Self-Efficacy in the Classroom						
1. I felt comfortable using the iPads for school at the end of the eighth grade.	81	31	34	13	3	0
2. I enjoy the classes in which we use the iPads more than the classes in which we do not use the iPads.	81	36	26	15	3	1
7. I feel like having the iPads in my classrooms is beneficial to my learning.	81	32	35	7	5	2
15. I can use the iPad in class to help me learn.	81	34	37	8	2	0
22. I feel more comfortable using the iPad after having them in my ninth-grade classes this year.	81	41	32	5	2	1
24. I feel comfortable using the iPad in my Math class.	81	30	26	10	8	7
25. I feel comfortable using the iPad in my Science class.	81	32	32	11	4	2
26. I feel comfortable using the iPad in my English class.	81	46	33	1	0	1
27. I feel comfortable using the iPad in my elective classes (South Pointe 101, Spanish, etc.).	81	47	26	6	2	0
28. I feel comfortable using the iPad in my Social Studies class.	81	36	31	6	4	4
Perception of Teacher Self-Efficacy						
4. My teachers can help me when I have questions about using the iPad.	81	27	37	10	6	1
5. I feel like my teachers are comfortable using the iPads in their classrooms.	81	21	38	13	9	0

Note. **N=Number of Student Respondents, SA= Strongly Agree, A=Agree, IDK/N=I Don't Know/Neutral, D=Disagree, SD=Strongly Disagree.

For all survey items, students reported SA and A 1,945 (86%) times compared to IDK/N, D, and SD 323 (14%) times, showing more positive responses regarding self-

efficacy in the areas on which the survey focused. None of the questions showed more students answering D or SD than A or SA. For the purpose of discussion, a ratio will be provided when referring to each topic in the survey. The first number in the ratio will be the number of students/teachers who responded SA and A. The second number in the ratio will be how many students/teachers responded IDK/N, D, and SD. If the discussion is referring to a group of questions, an average ratio will be given among the questions in that group.

Skill self-efficacy. The skills students experienced the highest levels of self-efficacy were using Safari (web browser) 78:3, Google Drive 79:2, Edmodo 76:5, and sending emails 77:4. These skills were utilized by many of the teachers involved in the study (emphasis was put on Edmodo and Google Drive in regards to teacher PD). All focus group students claimed Edmodo was "easy" to use. Student E claimed Google Drive was helpful in English because it allowed quick feedback from teachers and other students. Fewer positive responses regarding self-efficacy were reported in the areas of resolving problems 65:16 and learning new functions 67:14. During the focus group, student H stated, "When you needed help using an app, it was very easy to get directions." Also, several of the problems students reported they encountered during class were limitations of the device itself (i.e., restrictions, programs not being available). Student surveys reported a 65:16 ratio, which falls on the lower end of the scale, when referring to feeling more comfortable using technology due to having the iPad. All of the focus group students stated they had used the device before they began the 1:1 initiative in the ninth grade. Another area in this "lower self-efficacy group" was taking tests/quizzes 58:23. However, students E, D, and H reported the teachers did a good job putting tests and quizzes on the iPads. The survey results also showed lower self-efficacy

levels in the area of accessing social media (59:22). One of the focus group questions asked students about their fondest memories of using the devices at school and not one student claimed social media as a favorite. The levels presented in this subgroup were still indicative of high confidence among the vast majority of students (a much larger number of students answered SA or A than the other response options). In the focus group questioning, student E said teachers did a good job putting tests and quizzes on the iPads. This subgroup, Skill Self-Efficacy, had the lowest number (72:9) of Disagree and Strongly Disagree responses, which shows skills to be a strong area of self-efficacy after 1 year of 1:1 implementation.

The ninth graders in this study were exposed to several apps this year via their teachers due to the 1:1 initiative. When asked during focus group questioning about student efficacy using the apps on the iPads, four students stated the apps were easy to navigate, and four students said they were comfortable, but they had encountered issues at some point. Regarding teacher instruction, all students in the focus group were complimentary of how the teachers handled the devices as an instructional tool. Not one student remarked negatively about teachers or classroom instruction. One student (Student H) stated, "When you need help using an app, it was very easy to get directions." Edmodo, one application several ninth-grade teachers incorporated into their classrooms this year, was a topic of discussion during the focus group session. Two students (H and G) stated posts were sometimes hard to locate, but the students who pinpointed Edmodo in the focus group questioning all stated that mainly it was easy to navigate. This reflected their survey results stating the apps are easy to navigate and use. According to student reports, their skill level in using the apps the teachers were encouraged to incorporate helped to increase self-efficacy when using the devices due to

the fact they were using some of the same apps throughout various classroom environments. Student G stated, "This year we used the iPads a lot more than we did last year. We use it for math, English, pretty much every class."

Self-efficacy in the classroom. Of the classes pinpointed in the questions in the student survey, students reported the most self-efficacy using the iPads in their electives 73:8, English 79:2, and social studies 67:14 classes. Students named math class 56:25 to be the area they felt the least confident (although, again, there were few students who reported problems). Students also reported with the survey that they enjoy the classes during which they use the iPads 62:19 and also they feel the iPads help them learn 71:10.

Table 2

Comparison of Responses to Questions 1 and 22

Self-Efficacy in the Classroom	N	SA	A	IDK/N	D	SD
1. I felt comfortable using the iPads for school at the end of the eighth grade.	81	31	34	13	3	0
22. I feel more comfortable using the iPad after having them in my ninth-grade classes this year.	81	41	32	5	2	1

Note. **N=Number of Student Respondents, SA= Strongly Agree, A=Agree, IDK/N=I Don't Know/Neutral, D=Disagree, SD=Strongly Disagree.

Table 2 shows a comparison between the student responses to questions one and 22. Question one stated students felt comfortable using the iPads at the end of their eighth-grade year, and question 22 stated students felt more comfortable using the iPad after having them in their ninth-grade classes. Comparing these two questions, more students moved to strongly agree for item 22. There were fewer responses for item 22 than item one in every answer choice except strongly disagree. One student responded

strongly disagree for item 22, and none responded strongly disagree for item one. This shows a positive shift for the vast majority of students regarding self-efficacy from the end of eighth grade to the end of ninth grade. As a result, an increase in student self-efficacy is shown after 1 year with the 1:1 initiative.

During focus group sessions (focus group questions can be found in Appendix E), all eight students reported the iPads as making their classes easier and saving time when working on assignments. One student stated it helped her because she is a visual learner and the iPad offered more to her learning style than teacher-led instruction. When asked about their fondest memory of using the iPads in the classroom, students A, B, D, and H responded using techbooks; students A, C, and D stated playing games; students F and H said having more options when working on projects; and student E named using math apps as activities they enjoyed. However, all students included in the focus group claimed they had some technology background (middle school, home, etc.), which helped them navigate and feel comfortable with the devices. Students E, F, and H named writing essays; students H and E claimed sharing documents with peers and teachers for editing; student G said watching educational videos; students A, C, and G stated working at their own pace; and students D, E, and H said taking tests and quizzes went particularly well when they were using the iPads. The report of tests and quizzes going well let the researcher know the students who struggled in this area obviously were not chosen to participate in the focus groups.

When the students included in the focus group were asked if they had background in using iPads, they all said yes. However, students A, B, G, and H discussed how they used them more this year. The increased usage of the iPads in various settings exposed them to various applications and more utilization methods. The adoption of the techbook

took place this year in science and social studies classes and the focus group students D, B, A, and H spoke favorably about the elements it added to the classroom experience. When asked about the fondest memory from using the iPads in class, student A stated, "Techbooks because we got to read over it all by ourselves and look at videos and play games out it on our own." Students enjoyed the more interactive approach the techbook added to the learning experience and the addition of videos and games that can aid in the absorption of material by the visual learner. Student H stated, "Since I'm a visual learner, having something with me that I can see helps me a lot." When asked what teachers did well this year regarding iPads, students D, E, and G listed giving quizzes and tests; students B, C, and F said instruction; student H said the ease of getting directions for assignments; and student A discussed how the technology paired with the promethean board (interactive projector that can mirror the teachers' iPads) kept her on task and moving at a quicker pace. Students also claimed that even though the teacher helped, they were able to learn at their own pace. During the interviews (interview questions can be found in Appendix F), all three students named previous experience, all students said frequency of use, and students 2 and 3 claimed the popularity of Apple devices were the main reasons ninth graders reported mostly positively regarding self-efficacy on the student survey. Student 3 discussed how his teachers from his various classes helped him with different apps and gave good instruction on how to use the iPads and this helped increase his comfort level using the device.

Along with the factors that increased self-efficacy among students with their technology use in the classroom, there were also some frustrations they experienced that may have decreased their comfort and patience. Some areas of concern reflected by the open-ended responses in the student survey included students having to use different

iPads in each class and everyone not having their own (students had to pay $65 to rent an iPad if they did not have their own to bring from home and wanted one to use in various classes and take home, but teachers had extras for students to borrow only during class time if they chose not to rent one), all teachers not using them, wanting more time with them, and not using them enough.

During the focus group sessions, the students also discussed the restrictions that were put on the iPads and how sometimes it kept students from getting onto sites they needed for class. Some other frustrations named were Internet connection problems (student D), apps closing or disconnecting without saving (students F and H), and difficulty typing without a keyboard (student H). When asked what needs improvement, some students said, "Nothing." Others discussed the lack of Adobe Reader (students A, F, and H), as they needed it to open some elements of the science techbook. The fact that some students were not allowed to take them home was a concern for students B and G of the focus group. During the interview sessions, student 3 voiced his concern that tenth-, eleventh-, and twelfth-grade students do not have access to the iPads. He had been using one in the classroom since the seventh grade and wondered about the reasoning behind incorporating and teaching technology and then taking away the devices.

Another main concern that may have decreased self-efficacy of using technology in the classroom was the fear of losing paper and pencil activities. For the open-ended survey item asking for any additional comments, one student wrote about using pencil and paper more often in class and not using the iPads for every assignment. This topic came up again (without prompting) during the focus group session and students again voiced concerns over the lack of paper/pencil writing that is taking place in the classroom. During the focus groups, students G and A talked about their younger

siblings (the 1:1 initiative took place in all schools in the district with Grades 3-8 this year) who no longer take materials for handwritten assignments to school due to the fact everything is done on the iPads. Student H pointed out that a large number of students are not able to write in cursive to sign documents, and all students agreed that writing on paper and iPads should be at least 50/50 in the classroom.

Survey item number 31 asked students for any final comments. Many students offered suggestions/critiques, providing feedback as to how teachers and administrators could change the initiative to increase their comfort when using the devices. Four students were critical about overuse of the iPads. These four students responded that their classes depend on them too much, they thought they were fine without the iPads, some teachers add more work to assignments because of the iPad use, they do not like using them for every assignment, and the iPads are not as effective as teacher-led instruction; however, 11 students commented positively regarding the iPad use in class stating they were fun, beneficial, convenient, efficient, helpful, and easy to use. During focus group questioning, students went further into this topic and discussed the addition of Adobe and how the program was needed for some of their science lessons. A concern student E voiced was that the techbooks do not have an app and students had to search for them using a browser each time they wanted access. She claimed this was time consuming and an easy way to access/locate the techbook, such as an app, would have been helpful. Students B and G voiced concerns about how some students had access to the iPads at home and some did not. During the interviews, student 3 shared concern about how the ninth graders were the only students who experienced the 1:1 initiative in his school this year and how it was odd to offer technology to students in Grades 3-9 and then take it away in Grades 10-12. During the interviews, student 3 also suggested the

school have a tutorial at the beginning of the year when students pick up their devices so they will have the option to learn how to use apps, basic functions, etc. if they do not already obtain those skills. Responses to the open-ended survey questions, focus group topics, and interview questions all reflected the concern of partiality, the need for all students and grade levels to have access to the devices fairly, and the need for student tutorials.

Perception of teacher self-efficacy. Although there are only two questions presented in this section, it shows the lowest self-efficacy levels among students regarding the utilization of the iPads in the classroom. This subgroup presents the lowest average numbers of SA and A and higher numbers of IDK/N, D, and SD responses than the other two subgroups. The first subgroup, Skill Self-Efficacy, averaged 72:9, while the second subgroup, Self-Efficacy in the Classroom, averaged 68:13. This subgroup averaged 62:19. Students do not feel as confident that their teachers can answer questions about the iPads (64:17), and they feel less certain their teachers are comfortable using the devices (59:22).

One of the questions on the student survey asked how comfortable the students felt their teachers were when using the iPads in the classroom. In the research presented in Chapter 2, a recurring point is teachers need to be prepared before implementing a 1:1 initiative in the educational setting (Hutchinson et al., 2012; Franklin, 2011; Manguerra & Petocz, 2011; Rossing, 2012). This was one area where there were less SA and more D responses – a 21:9 ratio. Twenty-one was the lowest number of students who responded SA of all the student survey questions, and nine was the highest number of D responses of all the questions. Also, question four refers to the capability of teachers helping the students with the iPads when they need it. These responses produced a 64:17

ratio.

Two open-ended questions were incorporated into the student survey. One asked students what teachers and administrators could have done to make the iPads easier to use in the classroom this year. Five students remarked that teachers needed more training. This reflects how some students answered survey questions four and five regarding teachers being comfortable and the ability of the teachers to help students when they have questions about the iPads. Ten students also responded they would have benefited from more guidance based on how to use the iPads initially.

When asked what the school can do to make the iPad initiative better (during the focus group), student C said telling teachers to use better websites and students B, E, and H responded focusing more on learning and less on games. Responding to the open-ended survey question, seven students stated they would not change anything because the teachers did a good job utilizing the devices.

Teacher Results

Ten teachers were given a survey regarding their confidence levels in various areas of the 1:1 iPad initiative. Each of the teacher survey questions inquired about various areas of confidence when using technology for instruction. The questions given to the teachers to answer can be found in Appendix C. Table 3 reports teacher responses based on each survey item. For discussion, the results are referred to in a ratio of SA and A responses to NAnD (Neither Agree nor Disagree), D, and SD responses.

Table 3

Teacher Survey Questions and Results

	N	SA	A	NAnD	D	SD
1. I feel confident that I understand computer/technology device capabilities well enough to maximize them in my classroom.	10	2	7	0	0	1
2. I feel confident that I have the skills necessary to use the computer/technology device for instruction.	10	5	4	0	0	1
3. I feel confident that I can successfully teach relevant subject content with appropriate use of technology.	10	4	4	2	0	0
4. I feel confident in my ability to evaluate software for teaching and learning.	10	1	7	1	0	1
5. I feel confident that I can use correct computer/technology device terminology when directing students' computer use.	10	2	5	2	1	0
6. I feel confident I can help students when they have difficulty with the computer/technology device.	10	0	7	3	0	0
7. I feel confident I can effectively monitor students' computer/technology device use for project development in my classroom.	10	2	5	2	1	0
8. I feel confident that I can motivate my students to participate in technology-based projects.	10	3	7	0	0	0
9. I feel confident I can mentor students in appropriate uses of technology.	10	0	10	0	0	0
10. I feel confident I can consistently use educational technology in effective ways.	10	2	7	1	0	0
11. I feel confident I can provide individual feedback to students during technology use.	10	3	5	2	0	0
12. I feel confident I can regularly incorporate technology into my lessons, when appropriate to student learning.	10	2	7	0	1	0
13. I feel confident about selecting appropriate technology for instruction based on curriculum standards.	10	3	6	1	0	0
14. I feel confident about assigning and grading technology-based projects.	10	2	8	0	0	0
15. I feel confident about using technology resources (such as spreadsheets, electronic portfolios, etc.) to collect and analyze data from student tests and products to improve instructional practices.	10	3	4	3	0	0
16. I feel confident I can be responsive to students' needs during computer use.	10	1	9	0	0	0
17. I feel confident about keeping curricular goals and technology uses in mind when selecting an ideal way to assess student learning.	10	2	6	2	0	0
18. I feel confident that I will be comfortable using technology in my teaching.	10	2	6	2	0	0
19. I feel confident that, as time goes by, my ability to address my students' technology needs will continue to improve.	10	4	6	0	0	0
20. I feel confident that I can develop creative ways to cope with system constraints (such as budget cuts on technology facilities) and continue to teach effectively with technology.	10	1	6	2	1	0
21. I feel confident that I can carry out technology-based projects even when I am opposed by skeptical colleagues.	10	2	7	1	0	0

Note. **N=Number of Teacher Respondents, SA= Strongly Agree, A=Agree, NAnD=Neither Agree nor Disagree, D=Disagree, SD=Strongly Disagree.

Teachers rated themselves 10:0 in the areas of motivating students to use technology, mentoring students as they use the devices, assigning, grading and carrying out projects, responding to technology needs, and their own skills improving over time. A ratio of 9:1 came from questions regarding understanding the devices; having the necessary skills to teach with them; consistently, regularly and appropriately incorporating the devices; and carrying out projects even when opposed by skeptical colleagues. Teachers responded 8:2 when asked about teaching relevant content with appropriate use of the technology, evaluating software, providing student feedback during iPad use, keeping curricular goals and technology uses in mind when assessing students, and comfort using technology when teaching. The lowest SA and A responses were 7; and the highest NAnD, D, and SD responses were 3. Those responses came from the following areas of incorporating the devices into the classroom: using proper terminology, helping students with difficulties, monitoring students, using data from technology assignments to improve instruction, and coping with system constraints.

The following table displays each teacher and which response choice they chose for each of the questions based on their years of experience (least to most). Also included on this chart is a Confidence Level. This number is calculated by giving a value to each of the answer choices. In this table, the highest Confidence Level would be a 105 (this would result from answering all 21 questions as SA) and the lowest would be a 21 (this would result from answering all 21 questions as SD). For each answer, the following teachers would receive the following number of Confidence Level points: SA 5, A 4, NAnD 3, D 2, SD 1.

Table 4

Teacher Confidence Levels and Survey Question Responses by Years of Experience

	Yrs Exp	Con Lev	SA	A	NAnD	D	SD
Teacher 1	1-10	91	1-3, 15, 18, 19, 21	4-14, 16, 17, 20	---	---	---
Teacher 2	1-10	101	1-3, 5, 7, 8, 10-14, 16-21	4, 6, 9, 15	---	---	---
Teacher 3	1-10	93	2, 3, 5, 8, 11-14, 19	1, 4, 6, 7, 9, 10, 15,16-18, 20, 21	---	---	---
Teacher 4	11-20	89	2-4, 15, 17	1, 5-14, 16, 18-21	---	---	---
Teacher 5	11-20	91	2, 7, 10, 11, 13, 15, 19	1, 3-6, 8, 9, 12, 14, 16-18, 20, 21	---	---	---
Teacher 6	11-20	81	---	1-10, 12-14, 16, 18-21	11, 15, 17	---	---
Teacher 7	11-20	78	---	1-4, 8-14, 16-19, 21	5-7, 15	20	---
Teacher 8	11-20	81	---	1-6, 8-19, 21	20	7	---
Teacher 9	21-30	67	---	8, 9, 11, 14-17, 19	3, 4, 6, 7, 10, 13, 18, 20, 21	1, 2, 5, 12	---
Teacher 10	21-30	79	8	1, 2, 7, 9, 10, 12-14, 16, 19-21	3, 5, 6, 11, 15, 17, 18	---	4

Note. **Yrs Exp=Years of Experience, Con Lev=Confidence Level, SA=Strongly Agree, A=Agree, NAnD=Neither Agree nor Disagree, D=Disagree, SD=Strongly Disagree.

The teachers with 1-10 years of experience reported a confidence score of 95 when using technology in the classroom with all items of the survey. Teachers with 11-20 years of experience also reported a confidence score of 84. Both of these groups answered either A or SA for all items except one teacher. He/she answered D when asked about confidence in coping with budget constraints regarding technology in each

area.

As the years of experience increased to 21-30 years, teachers answered NAnD, D, or SD more often to the questions regarding their confidence when using technology in the classroom. The confidence score average of this group was 73. One teacher in this group answered SD in the area of evaluating software. The other teacher in this category answered D regarding his/her confidence in the areas of understanding the devices enough to maximize use in the classroom, having the skills necessary to utilize the devices for instruction, having the ability to correct students when they use improper terminology when referring to technology, and regularly incorporating technology into lessons. Of the 10 teachers who responded, nine reported to be confident in all areas addressed in the survey regarding utilizing instruction in the classroom.

Administrator Results

Two administrators were given a short questionnaire via email regarding their perceptions of the 1:1 iPad initiative. The questions from this survey can be found in Appendix D. The district level administrator will be coded D Admin and the school administrator will be named S Admin when discussing survey results. When asked about how often teachers were perceived to be utilizing technology in their classrooms this year, D Admin stated daily and S Admin answered weekly. The school administrator was in the school each day, therefore most likely reporting a more accurate prevalence. When asked how they would rate teacher PD prior to 1:1 implementation, D Admin stated, “Excellent;” and S Admin responded, “Satisfactory.” When asked how they would rate their own training prior to 1:1 implementation, D Admin replied “Satisfactory;” and S Admin stated “Unsatisfactory.” Students’ response to using technology in the classroom was rated “Satisfactory” by D Admin and “Excellent” by S

Admin. Also, English and math were the two subjects the administrators noticed teachers using iPads in during instruction most frequently. As discussed earlier, when the student survey asked about self-efficacy using the devices in math, their responses were less positive than in other disciplines.

When asked what went well during implementation, D Admin pointed out

- Administrators and CBL teachers did a great job deploying and leading the 1:1 initiative in the building.
- All 1:1 teachers were willing to take risks and attempt to implement the devices in their instruction at some level.
- Teachers were receptive to professional development/training and put the focus on how it would benefit their content area.
- Students took care of their devices and understood their responsibilities in ensuring they followed the proper procedures each day (i.e. bringing them out, putting them back at the end of class, bringing them to school each day).
- Students were actively engaged when using the devices in the classroom and understood it was a tool for learning and not a toy.

S Admin noted students' previous experiences with iPads and teachers' willingness to incorporate iPads into their classrooms regarding what went well with the implementation procedures. Although the teachers were willing to accept the devices, fidelity of implementation could not be ensured. The school administrator's response of previous experience with the iPads matches the focus group responses of students stating they had used the devices in middle school or at home prior to using them in the ninth-grade classroom.

Lastly, when asked what they would change about the 1:1 initiative implementation this year, D Admin suggested offering monthly PD for teachers, holding sessions where teachers could highlight active engagement practices, ensuring teachers were utilizing the iPads as much as possible, and administrators and teachers communicating in a more consistent and timely manner. S Admin responded with ensuring more planning during the rollout process and increasing security for the devices themselves (the school had approximately 30 iPads stolen at the beginning of the year). During the student interviews, a question was asked regarding what administration could do to help make using the iPads easier. Student B stated the beginning of the year procedures were confusing. She said she was given confusing information and ended up renting an iPad even though she had one at home. She would have liked to bring her own to school so she would not have to turn it back in or use classroom sets, but she was confused about procedures.

Research Question 1

What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation? It is made clear by the student survey responses that student self-efficacy when using the iPads in the educational setting, after 1 year of 1:1 implementation, looks more positive (86%) than negative (14%) among the 81 students who answered the student survey questions. Every student survey question resulted in an overwhelmingly higher response of SA and A (1,945 total) than IDK/N, D or SD (323 total). Students showed the highest levels of confidence in the Skills Self-Efficacy subgroup. With an average of 72:2 (SA, A:IDK/N, D, SD), survey results showed the highest levels when using Safari, Google Drive, Edmodo, and sending emails. Although the responses were still very positive, students

showed a little less self-efficacy when resolving problems, learning new functions, referring to their comfort using the iPads due to the 1:1 initiative, taking tests/quizzes, and accessing social media. The six students who participated in the focus group all commented positively regarding the ease of using the devices and capability of their teachers to help them. The three students included in the interview sessions also commented that the devices helped them when using them in class.

Regarding the second subgroup, Self-Efficacy in the Classroom, student survey responses named elective and English as the classes in which they experienced the most confidence using the iPads. The students were asked how comfortable they were using the iPads at the end of the eighth grade, and another question asked how comfortable they were using the iPads after the ninth grade. SA responses rose from 31 to 41 from the eighth grade to the ninth grade.

Research Question 2

What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation? Students in the focus groups and interviews claim past experience, the popularity of Apple devices, and increased usage across their various courses helped to increase self-efficacy when using the iPads during the 2013-2014 school year. Teachers were urged to use Google Drive and Edmodo during this particular school year, and these are two skills the students reported positively regarding confidence when using. One student discussed how she was a visual learner so the iPad made her feel more capable.

Restrictions on the iPads and the lack of certain programs, students claimed, limited the learning process and prevented them from performing certain tasks when using the techbooks. Focus group students listed Internet connection problems and apps

suddenly closing as issues when using the iPads. The lowest level of self-efficacy, of the three subgroups, was found in the Perception of Teacher Self-Efficacy section of survey questions. This was determined by student responses of 19 D and SD answers with regard to the ability of their teachers to answer their questions about the iPads and perceived teacher confidence when teaching with the iPads, compared to 62 responses of SA and A.

The teacher survey responses reflected 10:0, reflecting the highest levels of confidence in the areas of motivating students to use technology, mentoring students as they use the devices, assigning, grading and carrying out projects, responding to technology needs, and their own skills improving over time. Teachers showed the least confidence, 7:3, in the areas of incorporating the devices into the classroom: using proper terminology, helping students with difficulties, monitoring students, using data from technology assignments to improve instruction, and coping with system constraints. The three teachers with 1-10 years of experience scored a confidence level of 95 when using the devices in the classroom, compared to a confidence level of 84 among the five teachers with 11-20 years of experience and a score of 73 for the two teachers with 21-30 years of experience.

The two administrators who participated in the questionnaire observed teachers using the devices in the classroom daily or weekly and stated teacher PD was satisfactory or excellent. One of the two administrators rated his training prior to the 1:1 initiative implementation as unsatisfactory. Both administrators stated teachers were receptive to using the devices in the classroom.

Research Question 3

According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting? Students remarked a tutorial based on the basic functions of the iPads would have been helpful at the beginning of the year when the devices were distributed and use in the 1:1 classroom began. In the open-ended survey question asking for any additional comments, five students said teachers needed more training. Students in the focus group and interviews claimed the functions and capability of the iPads were not enough to meet some learning needs and the addition of Adobe would be a good place to start. Students in the focus group session discussed the lack of paper/pencil activities and how this made them fearful writing skills would lose importance. Students in the focus group also mentioned it would be beneficial for all students to have an iPad they can take home, not just the students who rented or owned one. One student responded to the open-ended survey question requesting any additional comments that all teachers needed to use them, not just ninth-grade teachers. There was some conflict in the open-ended question responses when some students claimed the iPads should be used less, and some students urged the teachers to use them more.

Summary

The student and teacher surveys reported overall high areas of self-efficacy after 1 year of using mobile devices in their ninth-grade classrooms. The results seem to point to previous experience with the iPads, teacher instruction, and the popularity of Apple products to be factors that led to the more positive responses regarding self-efficacy. Frustrations, which may have led to decreased levels of self-efficacy, seem to lie in the areas of students' perceptions of teacher

confidence when utilizing the devices in the classroom, not having the appropriate programs to permit (or having restrictions which prevent) maximized learning experiences, and teachers' lack of consistency in how they use the iPads in various classes. According to administrators, teachers, and students, in order to make the initiative better, teachers and administrators should have received more training prior to implementation, the rollout procedure needed to be more precise, and students would like more paper/pencil assignments to go along with the iPad use. In the next chapter, the results presented here are elaborated upon and conclusions are drawn.

Chapter 5: Discussion

Overview

In order to help eliminate the achievement gap, promote 21st century learning, and motivate students in the educational setting, some school districts have implemented 1:1 student technology in the classroom (Ahmed Atta, 2012; Barrow et al., 2007; Bloemsma, 2013; Castagnaro, 2012; Crichton et al., 2012; De Abreu, 2010; Franklin, 2011; Huang et al., 2010; Kay & Lauricella, 2011; Lam & Tong, 2012; Livingston, 2012; Peluso, 2012; Peters, 2007; Rossing, 2012; Stortz & Hoffman, 2013; Terras & Ramsay, 2012; Vu, 2013). During the 2013-2014 school year, a suburban school district in South Carolina implemented a 1:1 technology initiative in the third through eighth grades. During the same school year, one high school in this district decided to pilot the 1:1 initiative among the ninth-grade teachers' classrooms. The researcher gathered data regarding 1:1 technology use in the educational setting and realized a lack of information was available regarding the self-efficacy of students when using technology in the classroom. The researcher is a ninth-grade teacher at the high school where the 1:1 program was implemented and has served as a technology leader in the school. This being the first year the district offered technology access to all students, gathering data from the ninth-grade students, teachers, and administrators could help the other two high schools in the district with their eventual transition to 1:1 classrooms. Therefore, the researcher set out to answer the following questions:

1. What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation?
2. What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of

implementation?

3. According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting?

In Chapter 2, data were gathered regarding the implementation of iPads or other mobile devices into the educational setting. Since this is a rapidly growing trend, there were plenty of data regarding technology and the classroom (iRock, 2013). There were very little data regarding student self-efficacy. The researcher decided to find out how confident students were with their own iPad skills after 1 year of 1:1 implementation. Surveys, focus group questioning, and interviews were utilized to gather data from students. Teachers and administrators were also surveyed/questioned to find additional data or trends. Data from students, teachers, and administrators were analyzed, and the results from the study were presented as three categories of Skill Self-Efficacy, Self-Efficacy in the Classroom, and Perceived Teacher Self-Efficacy. These data are presented in Chapter 4, along with sections focusing on student survey results and administrator survey results. For the purpose of discussion, in this chapter the survey responses will be written SA for "strongly agree," A for "agree," IDK/N for "I don't know/neutral," D for "disagree," and SD for "strongly disagree."

In this final chapter, limitations and recommendations regarding this study are presented. The results presented in Chapter 4 are also discussed in this chapter. Ratios will be provided to show the strength of the responses. The first number in the ratio will represent how many participants responded SA or A to the question. The second number in the ratio will indicate how many participants answered IDK/N, D, or SD to the survey question.

Limitations

In addition to the limitations named in Chapter 3 of this study, a few can be added which may have impacted the results and conclusions. First, only 81 of 372 ninth graders returned the permission slip to participate in the study. The ninth graders who struggle in school were most likely the students who did not return the form. As a result, the researcher did not hear from this group of students regarding their self-efficacy using the iPads and their recommendations to make the process run more smoothly. It would have been ideal if all ninth graders were able to participate in the study so the highest possible level of diversity could have been ensured.

Also causing some unforeseen change to the intended course of the study, there was a technical problem during the interviews with the video camera so the researcher had to repeat the interviews. The first time the interviews were held, there was a neutral leader hosting who the students did not know personally. Due to the unforeseen technological difficulties, the researcher had to conduct the interviews. The researcher taught two of the three students included in the interviews and had a positive relationship with both. This may have disrupted results due to the fact the students did not want to hurt the researcher's feelings or be completely honest about their feelings regarding the iPad initiative. The researcher was a technology leader in the school and worked with the interview subjects a great deal on technology and the use of the iPads throughout the year.

One final limitation to this study was the access the student subjects had to the iPads the year prior to implementation. If the study would have been based on students using educational technology for the first time, it may have yielded different results. It is difficult to determine if students gained more self-efficacy via their experiences during

this school year or middle school experience.

Research Question 1

What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation? In this study, the researcher found generally positive responses regarding student self-efficacy when using the iPads in the educational setting after 1 year of the 1:1 initiative. Total student survey responses resulted in 1,945 SA or A (more positive) responses compared to 323 IDK/N, D, or SD (more negative) responses. Ten teachers were surveyed as well with regard to their own confidence levels when using the devices as teaching tools. Regarding the literature, Livingstone (2012) pointed out that educators are being pressured to change the way classrooms operate in order to meet the needs of a digital society. The researcher felt it was important to see any links between student and teacher self-efficacy with regard to using the mobile devices in the classroom. The total responses to teacher survey questions regarding teacher confidence when using the devices were generally positive as well (179 compared to 31), with no more than three teachers answering IDK/N, D, or SD for any question. The teachers in this study with the most years of teaching experience, 21-30 years, showed the least confidence using the devices in the classroom. The literature suggests that mandatory, differentiated PD should be offered to teachers in order for their experiences to be useful when using technology in the classroom (Edwards et al., 2012). A school- and district-level administrator were given a questionnaire regarding their perceptions of the 1:1 initiative. Since they ranked their own experiences with PD prior to rollout as satisfactory or unsatisfactory, as opposed to excellent, the training they were given was not exactly what they felt they needed.

When the students in this study were asked about self-efficacy using the devices in math, their responses were less positive than in other subjects. The ratios of SA and A compared to IDK/N, D, SD were as follows: math 56:25, science 64:17, social studies 67:14, elective classes 73:8, and English 79:2. This may be due to some math teachers not using the devices like they were intended or a few teachers using them with higher frequency. More, varied PD opportunities may need to be offered in this area for teachers as well. The research suggests that using technology in the math classroom can be beneficial to student learning, but teachers have been unclear as to how to utilize the devices appropriately (Bennison & Goos, 2010). The results of this item on the administrator survey do not represent the high level of self-efficacy students reported in the student surveys. The administrators stated they observed math as one class where the iPads were used the most frequently. It may be the case that math teachers did not use them to make learning easier; the students did not view the devices as helpful in that particular class; or the teachers were unclear of how to use the devices in a meaningful way.

The data from this study also suggest positive self-efficacy comes from using the devices frequently and with various teachers. Students reported that they enjoy the classes where they use iPads (reportedly using them in electives, English, and social studies the most), and they felt the devices helped them learn as well with the survey. Perhaps using the devices in most of their classes led to their increase in comfort using the devices in the educational setting from eighth grade to ninth grade. The iPads have been used with some classes in the middle schools, but the 2013-2014 school year was the first year the students were included in a true 1:1 environment. The skills that students used in multiple classes yielded the highest confidence levels. With their prior

knowledge and increased exposure, performing iPad skills was an area where students felt they could perform well. Again, since the programs transcended the subject areas, students most likely felt more comfortable with those skills because of this. Of the 81 students who participated in the survey, the highest levels of self-efficacy were indicated when students were working on Safari, Google Drive, Edmodo, and sending emails, with an average ratio of 77.5:3.5. Several of the ninth-grade teachers utilized Google Drive and Edmodo in their classrooms. The research suggests that the more frequently the devices are used in various settings, the more immersion will take place (Shapley et al., 2008). In the literature, Manuguerra and Petocx (2011) also found mobile learning devices to be helpful in creating a more challenge-based classroom setting, which is more engaging for students. This mirrors findings in the Rossing (2012) study, where student reports stated the mobile learning environment was easier, more engaging, and more stimulating than the traditional teacher-led classroom. The more often students in this study used the devices, the more confident they became.

For example, during the focus group, one student discussed how his teachers from his various classes helped him with different apps and gave good instruction on how to use the iPads, and this helped increase his comfort level using the device. As mentioned before, perhaps the increased exposure in various areas of learning helped to increase self-efficacy levels. Combined with their previous experiences and the additional learning strategies put in place in these students' classrooms, it seems skill self-efficacy, among these students, is at a high level due to increased opportunities to use the devices in multiple, more engaging settings.

The areas where students reported the lowest levels of self-efficacy were resolving problems (65:16), accessing social media (59:22), learning new functions

(67:14), feeling more comfortable using technology due to having the iPad (65:16), and taking tests/quizzes (58:23). Generally speaking, all of these survey items produced an overwhelmingly positive response from students, but these few yielded fewer SA and A responses and more IDK/N, D, and SD responses. These skills were on the lower end of the spectrum presented, even though the spectrum itself consisted of more people answering positively than negatively.

Research Question 2

What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation? In this study, the highest numbers of positive teacher responses came from questions regarding motivating students to use technology; mentoring students as they use the devices; assigning, grading, and carrying out projects; responding to technology needs; and their own skills improving over time. All 10 teachers responded SA or A to these questions. These are major factors that may have led to overall higher numbers of positive responses regarding self-efficacy for students. If teachers feel confident helping students use the devices and are not opposed to learning, it means they may see the initiative as ongoing and not just another trend. Students in the current study also claimed their teachers could have benefited from more training with the devices. Therefore, teacher preparedness is a factor that contributes to the increased self-efficacy levels of students. According to the literature, in Feltman's (2013) study, students claimed they would have benefited if the teacher had been better prepared. Bandura and Kupers (1964) claimed in the literature that student motivation to complete tasks may come from the confidence of their leaders. This also suggests increased teacher self-efficacy may increase student self-efficacy.

If the school administrator does not feel well prepared, it is difficult for the students to feel comfortable obtaining the devices. The less-than-excellent rating by the school administrator regarding teacher PD opportunities may be a contributing factor as to why some teachers reported less confidence in some areas of utilizing the devices in the classroom. The less-than-excellent rating administrators gave their own training is also a major concern. The research suggests longer PD sessions (4-6 hours) in an ongoing manner (monthly) for all teachers can lead to more teacher buy-in and overall student immersion (Shapley et al., 2008). The purpose of PD is to create prepared participants. This needs to be ensured on all levels.

Regarding the same topic, one of the focus group students in this study stated she would have liked to have brought her own device from home to school so she would not have to turn it back in or use classroom sets, but she was confused about procedures at the beginning of the year. This may have created some of the frustrations the students discussed during the focus group session. The school administrator hinted to this in his response to the question about what he would change with the initiative. He stated he would have had a more detailed plan for the rollout at the beginning of the year. With more proper training on how to effectively execute the rollout, stakeholders at all levels would have been more aware of procedures and expectations.

Students in this study named the benefit of using the device to gather feedback from teachers and other students as a positive factor when using the devices in the classroom. This easy sharing may have been a leading factor in the high level of self-efficacy expressed by students with regard to using the iPads in the classroom. According to the literature, an environment where data are easily shared and discussed can create increased confidence in students regarding their competencies (Rossing, 2012).

The 1:1 environment lends itself to allow easy access and distribution of information, therefore increasing communication opportunities between student and teacher.

The focus group students in this study claimed the iPads were easy to use due to the fact that they used them in middle school; however, the survey results reflected their self-efficacy increased during their ninth-grade year. This could be due to the fact that the students in the focus group stated they used them more during their ninth-grade year in a wider variety of classes. The school administrator listed the previous iPad experience the students had and teacher willingness to incorporate the devices into the classroom as positive factors regarding the initiative. During the focus group session, all students claimed they had a background with using the devices in the educational setting, but most said their usage increased during their ninth-grade year. No students claimed their teachers were unhelpful or unable to use the devices properly during class. They claimed the instruction they got from their teachers helped them with their success; however, the students responded to the open-ended survey questions that teachers needed more training before using the iPads during class. Due to their past experience with the devices, if teachers could not help them solve a problem, maybe students were capable of figuring it out on their own. Also, maybe the teachers were only proficient in the apps they were using and the students had more knowledge regarding the device than their teachers. During focus group questioning, the students in this study also reported the apps were easy to use and claimed one reason they were reporting positively regarding self-efficacy was because they were using the same apps in several of their classes. Again, the more exposure they have, the higher the self-efficacy levels may rise. According to the literature, the more exposure they have to the devices, the more confident they will be when using them (Rossing, 2012). As mentioned in the discussion

of Research Question 1, the more opportunities the students have to work with the devices, the more confident they become when using them in the school setting.

All focus group students in this study reported the devices made their classes easier and saved them time when completing assignments. Similar to these findings, the literature states students included in the Feltman (2013) study also claimed the iPads increased the pace of completing assignments since more could be done at once. These students also named techbooks, playing games, having options when working on projects, and math apps as activities they enjoyed when using the devices during class. They also named writing essays, sharing documents for feedback, watching educational videos, working at their own pace, and taking tests and quizzes as activities where they found the iPads particularly helpful. This finding agrees with Yang (2012), in a study of Taiwan students, who found "m-learning offered [students] more chances to acquire more information and supported collaborative and ubiquitous learning" (p. 152).

With open-ended survey questions, students in this study named the frustrations with using the iPads in the classroom to be everyone not having their own device, all teachers not using them, and wanting more time with the devices. These factors lead one to believe that in some classrooms, the devices were not utilized as the initiative intended. According to the literature, Crichton et al. (2012) conducted a study on the implementation of mobile learning devices and named students having the option to take the devices home as a factor for success when using the device for learning. During focus group questioning in this study, restrictions placed on the iPads, Internet connection problems, apps closing or disconnecting, difficulty typing without a keyboard, and the lack of certain programs (i.e., Adobe) as frustrations. Crichton et al. (2012) determined another prerequisite to the devices being beneficial was providing proper Internet access

to the students.

Teachers at the school in this study may be taking digital literacy more seriously than intended in some classes. Americans still require handwriting skills for signing documents, filling out paper resumes, and countless other life tasks that may arise. Maybe too much emphasis is being placed on digital literacy in the classroom. Focus group students in this study voiced concerns about losing paper and pencil assignments, which may eventually lead to decreased handwriting skills. Students have a right to be concerned if they are not practicing writing skills any longer in the classroom. Regarding the literature, Beschorner and Hutchison (2013) reported that literacy for students needed to include digital literacy. Also, Owston and Wideman (1997) did find growth in the quality of writing of students in the 1:1 environment over the traditional pen and pencil classroom setting. Therefore, although the devices have shown increases in writing levels for students, relying solely on the devices and removing actual handwriting from the classroom may cause anxiety among students, as it did in the current study. Allowing students to participate in both handwriting and using devices to write may be a factor that could increase student self-efficacy.

The math department involved in the current study could truly benefit from the devices if they are used in ways that have been proven to increase student learning. Via student survey responses, students named math class to be the discipline where they felt least confident (56:25) using the devices. This could be due to the fact that some teachers may not have implemented the devices in their classes as instructed with the 1:1 initiative. Barrow et al. (2007) conducted a study which suggested mobile devices show a statistically significant increase in math scores. Castagnaro (2012) also reported that technology, namely iPads, are needed in the math classroom. Since the literature also

states that PD sessions should be set to meet the needs of teachers, maybe the math department in this study did not receive the training it desired to meaningfully incorporate the devices into its classrooms (Knestis et al., 2011). Abulibdeh and Hassan's (2011) study stated, "student-content interaction makes the highest contribution to the e-learning interactions" (p. 1021). Maybe the apps they were using in math were not directly related to the content or did not help them learn the material since student self-efficacy levels were lower in this area; however, the students in the focus group never named math class as an area where they disliked using the iPads. There are four ninth-grade math teachers in the school. It may be that the students who responded negatively to the survey question pertaining to math (perhaps having one particular teacher) were not included in the focus group or interviews, so the researcher was not able to hear from those students.

Research Question 3

According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting? Teacher preparedness is seemingly obvious to students and could increase student self-efficacy. The literature states student feelings toward completing a task can come directly from the leaders who are at the front of the classroom (Bandura & Kupers, 1964). Students in this survey reportedly do not feel as confident that their teachers can answer questions about the iPads (64:17), and they feel less certain their teachers are comfortable using the devices (59:22). This, along with their less positive responses of self-efficacy when solving problems with the iPads on their own (65:16) could present a problem. Storz and Hoffman (2013) found teachers to be ill-prepared during their study based on 1:1 computing at the middle school level. The

teachers in this study implemented the initiative with students just 1 year past middle school. Feltman (2013) also had reports from students that the teacher also was limited in knowledge and learned as she went. The students in the Feltman study stated they would have benefited if the teacher had been better prepared. Paralleling this, a majority of the student subjects involved in Bloemsma's (2013) study also stated that they "wished their teachers had been better trained on how to best use the iPads in the classroom" (p. xii). According to the focus group and interview responses, most of the students had previous experience with Apple devices, so this may not play as large a role in this particular setting; but it is definitely something the students notice and it could negatively impact student confidence when using technology to learn.

Teachers are leaders for youngsters in our society. If teachers are showing signs of confusion or frustration when using iPads in the classroom, it seems the students in the class may pick up on those behaviors. As mentioned before, these doubts could be directly related to teachers choosing not to use the devices properly in their classrooms and, therefore, students not knowing how to make them useful for learning. According to the literature, a study based on observations between children and their adult leaders, Bandura and Kupers (1964) found young kids to reflect their models in behavior. The students were not connected directly to their individual teachers in this study, so it is difficult to determine which teachers are not buying in to the iPad initiative and which students have doubts regarding the devices due to this; however, some teachers were not as confident utilizing the devices, and students voiced their concerns with their survey responses regarding teacher readiness.

Perception of Teacher Self-Efficacy reflected the lowest (62:19) self-efficacy levels of the three subgroups. Livingstone (2012) found teaching in this age of

multimedia as “complex, compromised, and often contradictory” but also pointed out its possibility of enhancement (p. 61). When asked with an open-ended survey question what teachers and administrators could have done to make the iPads easier to use, students remarked more teacher training and student guidance on how to use the devices prior to the 1:1 initiative implementation. During interviews, one student recommended offering students a tutorial at the beginning of the year when students picked up their rented devices. The research also suggests hosting a Parent’s Night prior to device rollout allowing students and parents to become familiar with the devices, school policies, and initiative goals as essential to a successful 1:1 initiative implementation (Holcombe, 2009).

With the majority of teachers responding positively to all survey items regarding self-efficacy (179:31), it is surprising the students reported their confidence levels in their teachers as lower than in other areas. A study conducted by Vu (2013) showed a lack of teacher training and increased teacher skepticism in regards to using the devices. Some of the teachers in the current study seemed to be having similar feelings regarding using the devices in the classroom. It cannot be ruled out that the students who reported less positively regarding perceived teacher self-efficacy were enrolled in the classes with teachers lacking the needed skills to appropriately incorporate the technology. According to the literature, Bebell and O’Dwyer (2010) found that teachers need an abundance of PD to implement the 1:1 initiative properly.

It has been made clear that students can benefit from their teachers’ preparedness when implementing devices into the learning environment. The teachers with more (21-30) years of experience showed less confidence when teaching with the iPads. The more experienced teachers yielded an average confidence score of 73, while the teachers with

the least experience (1-10 years) responded with an average confidence score of 95. The less experienced teachers may have received more of the PD prior to the initiative implementation since the sessions were not mandatory. The district administrator hosted several PD sessions at the school at the beginning of the school year. It may have seemed like all teachers involved in the 1:1 initiative implementation were present. This may be why she replied that the PD opportunities were excellent and the school administrator replied that the opportunities were only satisfactory. If all teachers were not present, it would be difficult to assume all teachers were provided with appropriate training. Therefore, some teachers could have been inadequately prepared. Also, since the more seasoned teachers included in the survey were coaches, they may not have been available to attend PD sessions. This may have affected their self-efficacy regarding the areas they reported as low. All teachers should be offered PD that meets their needs in order to meet the needs of their students. When students responded negatively in this study regarding teacher readiness when implementing the initiative, it leads one to believe their teachers did not receive the training they desired or needed to be effective.

The school administrator stated the teachers were using the devices weekly. The district administrator stated students were using them daily. The school administrator was in the school each day, therefore most likely reporting a more accurate prevalence. Teachers may have ensured they were using the devices on days the district administrator visited the school or told the district administrator they used them more than they actually did. If teachers were only observed using the devices weekly, some may not have been incorporating them as the initiative intended or the initiative goals pertaining to frequency of use were not made clear to the teachers. This may be a reason behind students lacking confidence in their teachers using the devices.

Connections to Theory

Three theories were connected between the research and the findings in this study: increased usage can lead to higher levels of self-efficacy, teacher behaviors can influence student behaviors, and meaningful PD opportunities can lead to increased teacher self-efficacy.

Increased usage of the devices in various classes can be linked to increasing student self-efficacy. Students in this study reported using the devices in many of their classes, and the research suggests this can lead to increased comfort levels (Shapley et al., 2008). Students in this study also verbally claimed during focus groups that this and past experience using the iPad led to their high levels of self-efficacy when using the devices in class.

According to the literature, students tend to model the behavior of their leaders (Bandura & Kupers, 1964). The Bandura and Kupers (1964) study also found young kids reflect their models in their behaviors. Therefore, if the teacher models herself as a learner and remains confident in the classroom when introducing new skills, this may transmit to her students. If all teachers and administrators felt they were well prepared for the 1:1 initiative, students may have responded more favorably regarding their confidence in their teachers when using the devices. Consequently, increasing teacher self-efficacy may lead to increased student self-efficacy.

When teachers are comfortable utilizing technology in the classroom and have had sufficient time to learn how to use the devices to teach, they can more easily see the devices as beneficial to student learning gains. If teachers are not trained in an effective and meaningful way regarding how to appropriately incorporate the devices, skepticism may infiltrate the instruction which can lead to decreased student buy-in regarding using

the devices for learning (Bebell & O'Dwyer, 2010; Vu, 2013). Teacher PD experiences could lead to increased levels of teacher self-efficacy regarding incorporating technology into the classroom. If teachers feel confident that the devices will aid in student learning, students may be more likely to see the devices as useful and not just another trend. Therefore, as teacher self-efficacy increases, student self-efficacy may increase. Students in this study verbally stated they felt their teachers were helpful and did a good job implementing the devices for learning. This may be one reason why the student self-efficacy levels yielded more SA/A survey responses than any combination of the IKD/N, D, and SD regarding their confidence using the devices in the classroom.

Further, higher levels of thinking have been linked to student self-efficacy. Students in Bloemsma's (2013) study

> reported being most engaged in activities which tapped into the Redefinition and Modification categories of Puentedura's SAMR (Substitution, Augmentation, Modification, and Redefinition) Model. A majority of the students desired more frequent use of iPads and stated that they wished their teachers had been better trained how to best use the iPad in the classroom. (p. xii)

In order for students to feel as confident as possible, teachers need to be confident in their own meaningful use of the devices and in the educational setting (Bandura & Kupers, 1964). Required PD opportunities need to be provided to teachers as soon as possible in order for them to find this comfort (Shapley et al., 2008). There were not many mandatory, in-advance PD opportunities for teachers and administrators involved in this study; had there been, teachers and administrators would have been knowledgeable regarding standards of how, when, and what to include in their lessons involving the devices. Therefore, students could have been more aware of what to expect as well. The

student in this study who voiced her concerns regarding her confusion with beginning of the year procedures was certainly not alone. Students in this study would not have had to endure those questionable moments if the staff would have been aware of set standards and procedures.

Recommendations

According to feedback from the students in this district, a recommendation to the district would be to keep the iPads. Students responded overwhelmingly positively to using the devices and remarked they wished they could use them in tenth, eleventh, and twelfth grades. Students also reported benefiting from using the devices in the classroom. Since the high school in this study was piloting the 1:1 program within the high school, it seems students in the other two high schools in the district could possibly benefit from using the devices as well.

According to feedback from students, teachers, and administrators included in this study, increased security of the devices during the roll-out process, increased PD opportunities for staff, offering a student tutorial at the beginning of the year, providing clearer instructions regarding how and how often to use the iPads in the classroom for teachers, better communication between administrators and teachers, and ensuring teachers have the support they need to incorporate the devices as they are intended could improve student self-efficacy during the first year of 1:1 implementation. With more precise procedures and more school administrator training, the distribution process at the beginning of the year could have gone more smoothly and students may have been better informed regarding expectations, limitations, and permissions when using the classroom, personal, and rented iPads for school (Shapley et al., 2008). More mandatory PD may have decreased the Disagree and Strongly Disagree responses (31 total) from the teachers

in this study regarding their own self-efficacy levels using technology in the classroom and, therefore, may have possibly increased student self-efficacy and confidence in their teachers (Shapley et al., 2008). All areas of concern voiced by administrators can be improved upon by adding appropriate PD opportunities, increasing the time administrators spend in the classroom to monitor what is actually taking place, and increasing structure/planning throughout the whole roll-out process (Shapley et al., 2008).

Surveys conducted before, during, and after PD opportunities begin can aid in truly meeting the needs of teachers while maintaining project goals remain in focus (Knestis et al., 2011). When teachers and other stakeholders are included in the decision making regarding topics for PD sessions, an atmosphere is created where teachers feel confident as educators and everyone involved can take responsibility for the outcomes (Smolin & Lawless, 2011). It could also be beneficial to have input from all levels to ensure best practices are being considered from all angles. Teachers should be thoroughly trained on what programs/apps are to be implemented and what that will look like to the students prior to rollout (Faulder, 2011). According to the research, it would be beneficial to have at least 1-2 years of intense training prior to rollout to prepare teachers for the initiative (Faulder, 2011). Although the teachers in this study reported overall higher levels of confidence with regard to their own abilities when using the devices, the literature states students thrive in an environment where data are easily shared and discussed (Rossing, 2012). When teachers provide this type of environment for students, the self-efficacy beliefs of students may increase regarding their own competencies (Rossing, 2012). Ample time should be allotted to ensure teachers are capable and comfortable providing that type of environment for students (Zucker & Hug,

2007).

To increase the self-efficacy of students, it may help for teacher PD to be mandatory when 1:1 technology is implemented to ensure the teachers with more years of experience will attend and be able to learn (Shapley et al., 2008). The two teachers involved in the teacher survey with the most years of experience also coach after-school sports throughout the school year. Monthly Late Start time and faculty planning sessions that take place during planning periods could be utilized to offer mandatory training opportunities in order to include those who cannot participate in after-school PD.

For schools or districts considering 1:1 implementation, prior to device rollout, based on the research, schools should be sure to do the following: (1) begin PD opportunities no less than 1 year prior to rollout; (2) frequently gather input from teachers regarding what sessions they feel they need and which sessions have been helpful; (3) provide a detailed step-by-step roll-out procedure for administration, teachers, and students to follow when the iPads are initially handed out; (4) provide students and parents with a workshop where they can learn basic skills, rules, regulations, etc. regarding using the iPads in the classrooms; (5) set classroom norms/goals for all teachers to follow regarding applications/programs they are to use, expectations on how often the devices are to be used for instruction, and student expectations when using the devices for learning; (6) try to find a way for students with limited funds to be able to use the devices after school hours if needed (maybe an after-school lab); and (7) each block, several teachers and possibly students (students should be trained prior to rollout also) who are proficient with the devices should be named as go-to people in the building in case other teachers have questions or problems and need assistance (Faulder 2011; Holcombe, 2009; Knestis et al., 2011; Shapley et al., 2008; Zucker & Hug, 2007). After

rollout, teachers need to be continually offered PD, and a variety should be offered in order to meet the needs of the various levels of teacher-learners (the surveys can help with this) (Edwards et al., 2012). Also, sessions should be offered where more experienced teachers are available to help less-proficient teachers with basic functions (Faulder, 2011).

Implications for Future Research

One recommendation for future studies would be to run the same type of data collection on various school climates. Findings are truly only applicable to the students in this district. The results from this study may vary greatly from the results of the same study conducted with students of a different demographic. A second recommendation for future studies would be to test fidelity of implementation. How are the devices being used in the classroom, and where are teachers finding the most success among their students?

Another implication for further research would be to study various PD opportunities, which have been suggested to increase teacher self-efficacy. If a teacher is not proficient in using the device, students may become frustrated, and this could cause them to lose confidence in themselves as learners when using the device. A study could be created to survey teachers before and after PD sessions and at the beginning and end of the year to determine which sessions were most helpful to teachers (Smolin & Lawless, 2011). This could help determine the actual topics of training needed when preparing for the 1:1 initiative. Teachers should get a chance to also give feedback at the end of the year regarding what the PD was missing and what topics should be added to the list (Courville, 2011).

A study on 1:1 initiative implementation which upholds the prerequisites from the Crichton et al. (2012) research (students should have the option to take them home, proper Internet connections need to be provided, teachers need plenty of PD, etc.) could be conducted in a district during the first year any teachers have had access to classroom sets or allowed technology for learning in the classroom and may yield different results from the current study. The students in this study had so much experience, it was difficult to determine exactly from where their high confidence levels stemmed.

Summary

Bandura et al. (2001) stated, "the self-efficacy belief system is the foundation of human motivation" (p. 125). In an academic situation, self-efficacy may determine how a person learns or reacts to certain situations. Also, Griggs et al. (2013) reported with their study of fifth graders, "strong self-efficacy beliefs promote students' achievement in math and science" (p. 369). The more educators know about student self-efficacy with technology in the classroom, the greater their chance of a successful implementation. In this study, three research questions were posed; and the surveys, a focus group session, and interviews were used to determine the answers.

Research Question 1: What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation? In this suburban school in South Carolina, students, teachers, and administrators reported more positively than negatively regarding self-efficacy among students and themselves when including the devices in a 1:1 fashion in the educational environment. All participants reported much higher ratios of positive feelings towards the devices than negative. Although students reported positively overall regarding comfort in all subjects, English and elective classes were viewed as the classes where

students felt the most comfortable using the devices, and math was at the end of the list having the most negative responses. Students reported more positively than negatively regarding self-efficacy when using apps and sharing documents for feedback and found restrictions and Internet connection problems to be frustrations when using the devices. Although not all of the ninth graders in this school were represented in the study, this was a detailed case that gathered data from students regarding personal iPad use and overall use among ninth graders.

Research Question 2: What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after 1 school year of implementation? The data concluded prior experience, the popularity of Apple devices, and using the iPads in various classrooms are the leading factors in what contributed to the high level of technological self-efficacy among the ninth graders 1 year after the implementation of the 1:1 initiative. Students found the Internet connection problems, the lack of certain programs, and the fear of losing paper and pencil assignments as concerns. These concerns could have led to decreased self-efficacy levels; and if they were addressed, maybe the small number of negative responses to using the iPads in the classroom would become even smaller.

Research Question 3: According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting? Students and administrators reported that more training prior to the devices being distributed for teachers and students would be beneficial to create a smoother transition for everyone involved in the 1:1 classroom implementation. One student suggested offering a brief tutorial for students after the parent meeting. Some students stated teachers used the devices too much, and

some stated teachers did not use them enough. Maybe some consistency is needed among the classrooms as to when and how the devices are to be used. Since there were 30 iPads stolen at the beginning of the year, it was the suggestion of one administrator to find a secure place for the iPads to be kept during distribution. Another concern for students was that not all students had access to the devices after school. Unfortunately, with budget demands and domestic Internet capabilities, this is a concern that is beyond the control of the school.

In conclusion, this study showed the first year of the 1:1 iPad implementation to be quite successful in this school regarding student self-efficacy. After conducting student, teacher, and administrator surveys, an overwhelmingly positive response was reported regarding self-efficacy. Students were very complimentary of their teachers' abilities, although some classrooms could have benefited from more structured teacher and student training regarding the iPads. The students enjoyed using the devices in class, and some recommended they be used more frequently. Although students voiced concerns over losing pencil and paper activities, they reported the devices to be easy to use and beneficial to their own learning. Teachers and administrators pointed out a need for increased security of the devices prior to implementation and a need for more PD opportunities. The limitations in this study were minimal, and the recommendations included more training for students, teachers, and administrators prior to implementation and access to more apps/programs, which were needed for learning.

References

Abulibdeh, E., & Hassan, S. (2011). E-Learning interactions, information technology self efficacy and student achievement at the University of Sharjah, UAE. *Australasian Journal of Educational Technology*, *27*(6), 1014-1025.

Aesaert, K., Vanderlinde, R., Tondeur, J., & van Braak, J. (2013). The content of educational technology curricula: A cross-curricular state of the art. *Educational Technology Research and Development*, *61*(1), 131-151.

Ahmed Atta, A. (2012). Web 2.0: A movement within the learning community. *Information Management & Business Review*, *4*(12), 625-631.

Akour, H. (2010). *Determinants of mobile learning acceptance: An empirical investigation in higher education.* Retrieved from http://digital.library.okstate.edu/etd/Akour_okstate_0664D_10760.pdf

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).

Bandura, A. A., Caprara, G. V., Barbaranelli, C. C., Pastorelli, C. C., & Regalia, C. C. (2001). Perceived self-efficacy measure. *Journal of Personality and Social Psychology*, *80*(1), 125-135.

Bandura, A., & Kupers, C. J. (1964). Transmission of patterns of self-reinforcement through modeling. *Journal of Abnormal & Social Psychology*, *69*(1), 1-9.

Barrow, L., Markman, L., & Rouse, C. (2007). *Technology's edge: The educational benefits of computer-aided instruction.* Retrieved from http://www.nber.org/papers/w14240.pdf

Bebell, D., & O'Dwyer, L. M. (2010). Educational outcomes and research from 1:1 computing settings. *Journal of Technology, Learning, and Assessment*, *9*(1).

Bennison, A., & Goos, M. (2010). Learning to teach mathematics with technology: A survey of professional development needs, experiences and impacts. *Mathematics Education Research Journal*, *22*(1), 31-56.

Benton, B. K. (2012). *The iPad as an instructional tool: An examination of teacher implementation experiences.* (Order No. 3516595, University of Arkansas). *ProQuest Dissertations and Theses*, 150. Retrieved from http://search.proquest.com/docview/1029869338?accountid=11041 (1029869338)

Beschorner, B., & Hutchison, A. (2013). *iPads as a literacy teaching tool in early childhood*. Retrieved from http://files.eric.ed.gov/fulltext/ED543276.pdf

Bloemsma, M. S. (2013). *Student engagement, 21st century skills, and how the iPad is transforming learning in the classroom.* (Order No. 3566043, University of California, Irvine). *ProQuest Dissertations and Theses*, 170. Retrieved from http://search.proquest.com/docview/1415894557?accountid=11041 (1415894557)

Bush, M. H., & Cameron, A. H. (2011). *Digital course materials: A case study of the Apple iPad in the academic environment.* (Order No. 3457458, Pepperdine University). *ProQuest Dissertations and Theses,* 209. Retrieved from http://search.proquest.com/docview/874080374?accountid=11041 (874080374)

Castagnaro, A. V. (2012). *Evaluating sixth graders' self-efficacy in response to the use of educational technology.* (Order No. 3522881, The Claremont Graduate University). *ProQuest Dissertations and Theses,* 167. Retrieved from http://search.proquest.com/docview/1037995456?accountid=11041 (1037995456)

Courville, K. (2011). *Technology and its use in education: Present roles and future prospects*. Retrieved from http://files.eric.ed.gov/fulltext/ED520220.pdf

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods Approaches* (3rd ed.). Los Angeles, CA: Sage Publications, Inc.

Crichton, S., Pegler, K., & White, D. (2012). Personal devices in public settings: Lessons learned from an iPod touch/iPad project. *Electronic Journal of E-Learning*, *10*(1), 23-31.

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal*, *38*(4), 813-34.

De Abreu, B. (2010). Changing technology = Empowering students through media literacy education. *New Horizons in Education*, *58*(3), 26-33.

Dunleavy, M., Dexter, S. S., & Heinecke, W. F. (2007). What added value does a 1:1 student to laptop ratio bring to technology-supported teaching and learning? *Journal of Computer Assisted Learning*, *23*(5), 440-452.

Edwards, M., Smith, S., & Wirt, T. (2012). Go digital. *Learning & Leading With Technology*, *40*(2), 12-15.

Ensor, T. (2012). Teaming with technology: "Real" iPad applications. *Journal of Adolescent & Adult Literacy*, *56*(3), 193.

European Commission. (2009). *Creativity in schools in Europe: A survey of teachers.* Retrieved from http://www.pef.uni-lj.si/fileadmin/Datoteke/ CRSN/branje/ Creativity _in_Schools_in_Europe_A_Survey_of_Teachers__2009_.pdf

Faulder, T. R. (2011, January 1). *Technology integration: A research-based professional development program*. Retrieved from http://files.eric.ed.gov/fulltext/ED525563.pdf

Feltman, V. (2013). *The influence of interactive technology on student performance in an Oklahoma secondary biology I program.* (Order No. 3588439, Oklahoma State University). *ProQuest Dissertations and Theses,* 43. Retrieved from http://search.proquest.com/docview/1428173262?accountid=11041 (1428173262)

Franklin, T. (2011). Mobile learning: At the tipping point. *Turkish Online Journal of Educational Technology - TOJET*, *10*(4), 261-275.

Greaves, T. W., Hayes, J., Wilson, L., Gielniak, M., & Peterson, E. L. (2012). *Revolutionizing education through technology: The project RED roadmap for transformation.* Washington, DC: International Society for Technology in Education.

Griggs, M., Rimm-Kaufman, S. E., Merritt, E. G., & Patton, C. L. (2013). The responsive classroom approach and fifth grade students' math and science anxiety and self-efficacy. *School Psychology Quarterly*, *28*(4), 360-373. doi:10.1037/spq0000026

Holcomb, L. B. (2009). Results & lessons learned from 1:1 laptop initiatives: A collective review. *Techtrends: Linking Research and Practice to Improve Learning*, *53*(6), 49-55.

Hsiao, H., Tu, Y., & Chung, H. (2012). Perceived social supports, computer self-efficacy, and computer use among high school students. *Turkish Online Journal of Educational Technology - TOJET*, *11*(2), 167-177.

Huang, J. S., Yang, S. H., Yueh-Min, H., & Hsiao, I. T. (2010). Social learning networks: Build mobile learning networks based on collaborative services. *Journal of Educational Technology & Society*, *13*(3), 78-92.

Hutchison, A., Beschorner, B., & Schmidt-Crawford, D. (2012). Exploring the use of the iPad for literacy learning. *Reading Teacher*, *66*(1), 15-23.

iDevices. (2014, Feb. 6). *Wikipedia, the free encyclopedia.* Retrieved from http://en.wikipedia.org/wiki/IDevice

iRock. (2013, Nov. 4). Retrieved from http://irockanytimeanywhere.com

Joo, Y., Bong, M., & Choi, H. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and Internet self-efficacy in web-based instruction. *Educational Technology Research and Development*, *48*(2), 5-17.

Kay, R. H., & Lauricella, S. (2011). Exploring the benefits and challenges of using laptop computers in higher education classrooms: A formative analysis. *Canadian Journal of Learning and Technology*, *37*(1).

Knestis, K., Smoke-Zur, N., Gibson, R., Pike, J. Y., Higgins, C., & Hezel, A. (2011). *State-wide evaluation of the New Hampshire ESEA Title II, Part D grant program*. Retrieved from http://files.eric.ed.gov/fulltext/ED542702.pdf

Krueger, R. A. (2002). *Designing and conducting focus group interviews.* Retrieved from http://www.eiu.edu/~ihec/Krueger-FocusGroupInterviews.pdf

Lam, P., & Tong, A. (2012). Digital devices in classroom--Hesitations of teachers-to-be. *Electronic Journal of E-Learning*, *10*(4), 387-395.

Lewis, M. S., Zhao, J., & Montclare, J. (2012). Development and implementation of high school chemistry modules using touch-screen technologies. *Journal of Chemical Education*, *89*(8), 1012-1018.

Livingstone, S. (2012). Critical reflections on the benefits of ICT in education. *Oxford Review of Education*, *38*(1), 9-24.

Manuguerra, M., & Petocz, P. (2011). Promoting student engagement by integrating new technology into tertiary education: The role of the iPad. *Asian Social Science, 7*(11), 61-65.

National Center for Education Statistics. (2011). *The nation's report card: Reading and mathematics 2011. National assessment of educational progress at grades 4 and 8. Findings in brief.* Retrieved from http://nces.ed.gov/nationsreportcard/pdf/main2011/2012459.pdf

News Archive. (2013). South Carolina State Department of Education. Retrieved from http://ed.sc.gov/

Owston, R. D., & Wideman, H. H. (1997). Word processors and children's writing in a high-computer-access setting. *Journal of Research on Computing in Education*, *30*(2), 202-220.

Pajares, F. (2002a). *Overview of social cognitive theory and of self-efficacy*. Retrieved from http://www.emory.edu/EDUCATION/mfp/eff.html

Pajares, F. (2002b). *Self-efficacy beliefs in academic contexts: An outline*. Retrieved from http://des.emory.edu/mfp/efftalk.html

Peluso, D. C. (2012). The fast-paced iPad revolution: Can educators stay up to date and relevant about these ubiquitous devices? *British Journal of Educational Technology*, *43*(4), E125-E127.

Peters, K. (2007). m-learning: Positioning educators for a mobile, connected future. *International Review of Research in Open and Distance Learning, 8*(2), 1-17.

Riding, R. J., & Rayner, S. (2001). *International perspectives on individual differences, volume 2: Self-perception.* Westport, CT: Ablex Publishing.

Rossing, J. P. (2012). Mobile technology and liberal education. *Liberal Education*, *98*(1), 68-72.

Rowell, D. (2004). *Educational technology's impact on student attitudes in high school social studies.* (Order No. MQ93767, Royal Roads University (Canada)). *ProQuest Dissertations and Theses,* pp. 100-100. Retrieved from http://search.proquest.com/docview/305053370?accountid=11041 (305053370)

Shapley, K., Maloney, C., Caranikas-Walker, F., & Sheehan, D. (2008). *Evaluation of the Texas technology immersion pilot: Third-year (2006-07) traits of higher technology immersion schools and teachers.* Retrieved from http://files.eric.ed.gov/fulltext/ED536301.pdf

Smolin, L., & Lawless, K. A. (2011). Evaluation across contexts: Evaluating the impact of technology integration professional development partnerships. *Journal of Digital Learning in Teacher Education*, *27*(3), 92-98.

South Carolina Annual School Report Card. (2012). In *South Carolina Department of Education.* Retrieved from http://ed.sc.gov/data/reportcards/2012/district/s/D4603999.pdf

South Carolina Annual School Report Card Summary. (2013). In *South Carolina Department of Education.* Retrieved from https://ed.sc.gov/data/report-cards/2013/high/s/h4603041.pdf

Storz, M. G., & Hoffman, A. R. (2013). Examining response to a one-to-one computer initiative: Student and teacher voices. *RMLE Online: Research In Middle Level Education*, *36*(6).

Terras, M. M., & Ramsay, J. (2012). The five central psychological challenges facing effective mobile learning. *British Journal of Educational Technology*, *43*(5), 820-832.

Tuncer, M. (2013). An analysis on the effect of computer self-efficacy over scientific research self-efficacy and information literacy self-efficacy. *Educational Research and Reviews*, *8*(1), 33-40.

UCLA Office of Information Technology. (2014). *SPSS FAQ: What does Chronbach's alpha mean?* Retrieved from http://www.ats.ucla.edu/stat/spss/faq/alpha.html

Vu, P. (2013). *An inquiry into how iPads are used in classrooms.* (Order No. 3588039, Southern Illinois University at Carbondale). *ProQuest Dissertations and Theses,* 101. Retrieved from http://search.proquest.com/docview/1427346496?accountid=11041 (1427346496)

Yang, S. (2012). Exploring college students' attitudes and self-efficacy of mobile learning. *Turkish Online Journal of Educational Technology - TOJET*, *11*(4), 148-154.

Zucker, A. A., & Hug, S. T. (2007). *A study of the 1:1 laptop program at the Denver School of Science & Technology*. Retrieved from http://files.eric.ed.gov/fulltext/ED500425.pdf

Appendix A

Parent Consent Form for Student Participation

Consent Form: Technology Self-Efficacy Beliefs of Ninth-Grade Students after One Year of One-to-One Initiative Implementation

I am conducting research on the impact of technology on self0efficacy of students this year. I am investigating this because the research will help educators make informed decisions about using technology in the classroom based on the impacts revealed in the study. If you decide to do this, your child will be asked to complete a survey and possibly participate in focus groups/interviews discussing their experiences with using technology in the classroom during the month of May. Not all students will be included in focus groups/interviews.

There are no risks to students in this study. All information is confidential, and no person or school will be identified in the study. No individual information shared in the surveys, focus groups, or interviews will be used for any reason beyond the research study, nor will it be shared with school personnel or other students.

If your child takes part in this project, he or she will have the opportunity to give input about the future use of technology in schools. Taking part in this project is entirely up to you, and no one will hold it against your child if you decide not to do it. If your child does take part, he or she may stop at any time without penalty. There will be no grade for participation. In addition, you may ask to have your data withdrawn from the study after the research has been conducted.

If you want to know more about this research project, please contact me at XXXXXXXXXX or email me at XXXXXXX. This project has been approved by the Institutional Review Board at Gardner-Webb University, Rock Hill school district, and South Pointe High School administration. Information on Gardner-Webb University's policy and procedure for research involving humans can be obtained from Dr. Doug Eury at Gardner-Webb University.

Thank you for your help!

Sincerely,

Adrianne McGee, South Pointe High School Teacher, Gardner-Webb University Student

Consent Statement

I agree to let my child take part in this project. I know what he or she will have to do and that he or she can stop at any time.

_____ _____

Signature Date

Audio/Videotape Consent Addition

I agree to videotaping at South Pointe High School during the month of May, 2014.

_____ _____
Signature Date

I have been told that I have the right to see the videotapes before they are used. I have decided that I:

_____ want to see the tapes

_____ do not want to see the tapes

Adrianne McGee and other researchers approved by Gardner-Webb University may use the tapes made of my child. The original tapes or copies may be used for this research project, teacher education, and presentation at professional meetings.

_____ _____ _____
Signature Date Address

Appendix B

Teacher/Administrator Consent Form for Survey Participation

Consent Form: Technology Self-Efficacy Beliefs of Ninth-Grade Students after One Year of One-to-One Initiative Implementation

I am conducting research on the impact of technology on self-efficacy of students this year. I am investigating this because the research will help educators make informed decisions about using technology in the classroom based on the impacts revealed in the study. If you decide to do this, you will be asked to complete a survey regarding technology in the classroom this year. The survey will be completed during the month of May.

There are no risks to you in this study. All information is confidential, and no person or school will be identified in the study. No individual information shared in the surveys will be used for any reason beyond the research study.

If you take part in this project, you will have the opportunity to give input about the future use of technology in schools. Taking part in this project is entirely up to you, and no one will hold it against you if you decide not to do it. If you do take part, you may stop at any time without penalty. In addition, you may ask to have your data withdrawn from the study after the research has been conducted.

If you want to know more about this research project, please contact me at XXXXXXX or email me at XXXXXXXXX. This project has been approved by the Institutional Review Board at Gardner-Webb University, Rock Hill school district, and South Pointe High School administration. Information on Gardner-Webb University's policy and procedure for research involving humans can be obtained from Dr. Doug Eury at Gardner-Webb University.

Thank you for your help!

Sincerely,

Adrianne McGee, South Pointe High School Teacher, Gardner-Webb University Student

Consent Statement

I agree to take part in this project. I know what I will have to do and that I can stop at any time.

_____ _____

Signature Date

Appendix C

Teacher Survey Questions

Years of experience

1-10 years
11-20 years
21-30 years

1. I feel confident that I understand computer/technology device capabilities well enough to maximize them in my classroom.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

2. I feel confident that I have the skills necessary to use the computer/technology device for instruction.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

3. I feel confident that I can successfully teach relevant subject content with appropriate use of technology.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

4. I feel confident in my ability to evaluate software for teaching and learning.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

5. I feel confident that I can use correct computer/technology device terminology when directing students' computer use.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

6. I feel confident I can help students when they have difficulty with the computer/technology device.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

7. I feel confident I can effectively monitor students' computer/technology device use for project development in my classroom.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

8. I feel confident that I can motivate my students to participate in technology-based projects.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

9. I feel confident I can mentor students in appropriate uses of technology.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

10. I feel confident I can consistently use educational technology in effective ways.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

11. I feel confident I can provide individual feedback to students during technology use.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

12. I feel confident I can regularly incorporate technology into my lessons, when appropriate to student learning.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

13. I feel confident about selecting appropriate technology for instruction based on curriculum standards.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

14. I feel confident about assigning and grading technology-based projects.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

15. I feel confident about using technology resources (such as spreadsheets, electronic portfolios, etc.) to collect and analyze data from student tests and products to improve instructional practices.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

16. I feel confident I can be responsive to students' needs during computer use.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

17. I feel confident about keeping curricular goals and technology uses in mind when selecting an ideal way to assess student learning.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

18. I feel confident that I will be comfortable using technology in my teaching.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

19. I feel confident that, as time goes by, my ability to address my students' technology needs will continue to improve.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

20. I feel confident that I can develop creative ways to cope with system constraints (such as budget cuts on technology facilities) and continue to teach effectively with technology.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

21. I feel confident that I can carry out technology-based projects even when I am opposed by skeptical colleagues.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

Appendix D

Administrator Survey Questions

1. About how often do you think teachers, in general, used iPads in their classrooms this year for instruction?
    a. Daily
    b. Weekly
    c. Monthly
    d. Never
2. How would you rate the professional development opportunities offered to teachers prior to 1:1 implementation?
    a. Excellent
    b. Satisfactory
    c. Fair
    d. Unsatisfactory
3. How would you rate the training you received prior to the iPad initiative implementation?
    a. Excellent
    b. Satisfactory
    c. Fair
    d. Unsatisfactory
4. How would you rate the student response to using technology in the classroom at SPHS this year?
    a. Excellent
    b. Satisfactory
    c. Fair
    d. Unsatisfactory
5. What subject areas did you notice using the iPads the most?
    a. English
    b. Math
    c. Science
    d. Social Studies
    e. Electives
6. How did you observe teachers utilizing the iPads for instruction this year at SPHS (Edmodo, Google Drive, etc.)?
7. What went well with the iPad initiative at SPHS?
8. What would you change about the iPad initiative implementation at SPHS?

Appendix E

Focus Group Questions

1. How have you been involved in using the iPads last school year compared to this year?
    a. How do you feel about using the iPads this year compared to your 8th grade year?
    b. How do you think the way you use technology in school changed from the 8th to the 9th grade?
    c. How do you think the iPad helps you in school?
    d. How has it frustrated you?
2. Think back over all the ways that you've used iPads in school and tell us your fondest memory. (The most enjoyable memory.)
    a. How do you like using the iPads compared to paper/pencil assignments?
    b. Do you feel like you were prepared for the way you used them?
3. Think back over the past year (9th grade) of the things that you did with the iPads in your classes. What went particularly well?
    a. How do you feel about using the iPads for tests/quizzes?
    b. Do you think the teachers moved at a slow enough pace when including iPads into the classroom?
    c. What is your comfort level with navigating apps like safari, edmodo, and google drive on the iPad? How do you feel about using the apps?
    d. What did the teachers do well?
4. What needs improvement?
    a. What restrictions do you think kept you from doing what you wanted on the iPads?
    b. What do you think about the access students have to the iPads? Some students cannot take them home. How do you think this affects them?
    c. Do you feel like you have enough time with your iPad during the day to get your work done?
    d. Where did the teachers struggle?
5. If your best friend were beginning to use iPads in his/her classes, what would you let them know?
6. Suppose that you were in charge and could make changes that would make the iPad program better. What would you change?
7. What can each one of us do to make the iPad program better?
    a. Is there anything you would like to add about using the iPads in the classroom?

Appendix F

Interview Questions

1. Overall, students reported being very comfortable using the iPads this year in class. Why do you think that is?
    a. Did using the iPads more often this year (in most of your classes) help you become more confident using technology to learn?
2. In your classes, the teacher gives you instruction when you are given assignments using the iPad. Do you usually feel comfortable enough to complete assignments independently using the iPad after your teacher gives you instructions?
    a. Is it due to the content (what you are studying), the class, the teacher instruction or your ease of technology use?
3. Do you feel like you were prepared to use the iPads at the beginning of the 9th grade? What would have helped you become better prepared?
4. How can administration help you more with the iPads?

Appendix G

Survey Questions and Research Question Focus

**All questions will initially be asked to gather data regarding Research Question 1.

**With the exception of the demographic questions (presented at the beginning of the survey), all answer choices were on a five-point scale (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree).

I consider myself [ethnicity]:

My gender is:

My age is:

1. I felt comfortable using the iPads for school at the end of the eighth grade.

2. I enjoy the classes in which we use the iPads more than the classes in which we do not use the iPads.

3. I can receive feedback about a document/project from a teacher and make the necessary changes using the iPad.

4. My teachers can help me when I have questions about using the iPad.

5. I feel like my teachers are comfortable using the iPads in their classrooms.

6. I feel comfortable with the ability of my teachers to use the iPads when teaching.

7. I feel like having the iPads in my classrooms is beneficial to my learning.

8. I feel comfortable taking tests/quizzes on the iPad.

9. I can use the iPad apps easily.

10. I can use educational apps on the iPad easily.

11. I can usually learn new functions on the iPad easily.

12. I feel comfortable using the Safari app on the iPad.

13. I can open multiple Safari web pages at one time on the iPad.

14. I can use the iPad in my classes to create projects.

15. I can use the iPad in class to help me learn.
16. I can contact a teacher using the iPad.

17. I can send an email using the iPad.

18. I can use Google Drive to create a new document on the iPad.

19. I can use the iPad to share a Google document with another person/teacher.

20. I can access social media (Facebook, Twitter, etc.) using the iPad.

21. I can use Edmodo on the iPad for my classes.

22. I feel more comfortable using the iPad after having them in my ninth-grade classes this year.

23. I can usually resolve problems with my iPad.

24. I feel comfortable using the iPad in my Math class.

25. I feel comfortable using the iPad in my Science class.

26. I feel comfortable using the iPad in my English class.

27. I feel comfortable using the iPad in my elective classes (South Pointe 101, Spanish, etc.).

28. I feel comfortable using the iPad in my Social Studies class.

29. I believe having the iPad has made me more comfortable using technology.

30. What do you think South Pointe High School teachers and principals could have done to make iPads easier to use in the classroom this year?

31. Please feel free to add any comments about using iPads in the SPHS classrooms here:

Appendix H

Research Protocols, Link to Survey Questions, and Sample Focus Group and Interview Questions

**This is not the timeline the researcher was able to follow, but much preferred/suggested.

Step 1 (February-March): Principal, IRB, teacher, administrator and student subject parent approval requested.

Step 2 (March-April): Student subjects with parent permission complete the survey during South Pointe 101 classes and rotate in and out of the computer lab. Students should be given 30-40 minutes to complete the 34-item survey. Students should be provided with an explanation of the purpose of the study and an invitation to complete the survey prior to survey administration. All surveys should be completed within two class periods on an A/B block schedule, so this should take no more than four days.

Step 3 (March-April): Based on survey results, a set of students and questions should be determined to complete focus group sessions in order for the researcher to gather more data on student needs during the implementation of the 1:1 initiative and steps to improve self-efficacy of student technology use in the educational setting (Research Questions two and three). The focus group participants and questions should be determined within one week after surveys are administered. Since the researcher has also been a teacher to most of the students involved in data collection, a focus group leader will be chosen and trained in order to conduct videotaped focus group sessions. Focus group leaders should be provided with training and question lists. Focus groups should be conducted in a quiet conference room attached to the media center and the researcher should be available to answer any questions that may arise during the process.

Step 4 (March-April): Based on focus group findings, the researcher should determine interview subjects and questions to gather more specific data from individual students using one-on-one interviews. The interviewees and questions should be determined within one week after focus group sessions are completed. Trained interviewers (not including the researcher) should conduct these interviews in order to keep student responses unbiased. These sessions should also be video/audiotaped to allow easy transcription of responses. Interviewers should be provided with training and question lists. Interviews should be conducted in a quiet conference room attached to the media center and the researcher should be available to answer any questions that may arise during the process.

Step 5 (April-May): Results should be reported and shared with other high schools in the district to aid in their implementation of the initiative.

* All students will be thanked after each session and their anonymity will be ensured to maintain professionalism.

*The goal of this study is to gather data from students involved in the 1:1 initiative after one year of implementation in order to answer the following questions:

1. What does student self-efficacy look like in regards to using mobile devices in the 1:1 classroom setting after one school year of implementation?

2. What factors led to student self-efficacy, or the lack thereof, in regards to using mobile devices in the 1:1 classroom setting after one school year of implementation?
3. According to students, what could have been done during the initial implementation process to increase student self-efficacy in regards to using mobile devices in the 1:1 classroom setting?

The survey tool can be found here:
https://docs.google.com/forms/d/1D7Ss_IwiX59NPl9MA12lpJ6AASJm2oPMtPD2aVOVlrM/viewform

Sample Focus Group Questions:

1. What iPad instruction did you find most helpful?
2. What iPad instruction did you find least helpful?
3. What made using the iPads in Math class easy for you?
4. What made using iPads in English difficult for you?

Sample Interview Questions:

1. What about _____ instruction would you change?
2. What would you do to teach students how to use iPads in the classroom setting?
3. How would you go about teaching students in the ninth grade to use the iPads?
4. In general, what could your teachers have done to make you more confident when using the iPads in the classroom setting?

Appendix I

Cronbach's Alpha Reliability Test (for Student Survey) Results Using SPSS

Reliability Statistics:
Cronbach's Alpha .847 28
N of Items 28

Item-Total Statistics:
Column 1: Variable (question) Number
Column 2: Scale Mean if Item Deleted
Column 3: Scale Variance if Item Deleted
Column 4: Corrected Item-Total Correlation
Column 5: Cronbach's Alpha if Item Deleted

VAR00001	100.2500	146.023	.458	.840
VAR00002	101.1667	138.515	.745	.830
VAR00003	100.6667	143.515	.557	.837
VAR00004	100.5833	143.902	.410	.841
VAR00005	100.5000	146.091	.436	.841
VAR00006	101.4167	139.538	.609	.834
VAR00007	100.5000	143.000	.411	.842
VAR00008	99.4167	153.174	.329	.845
VAR00009	99.9167	152.992	.172	.848
VAR00010	99.9167	150.992	.264	.846
VAR00011	99.7500	148.386	.473	.841
VAR00012	99.5000	146.818	.334	.844
VAR00013	99.4167	145.902	.369	.843
VAR00014	100.3333	143.152	.410	.841
VAR00015	101.0833	138.447	.651	.832
VAR00016	99.5833	150.811	.519	.842
VAR00017	99.5000	150.455	.407	.842
VAR00018	100.5833	162.629	-.253	.859
VAR00019	100.7500	151.659	.136	.852
VAR00020	99.1667	156.333	.118	.848
VAR00021	99.5000	157.909	-.042	.851
VAR00022	101.0833	147.538	.263	.848
VAR00023	101.0833	140.265	.504	.838
VAR00024	100.3333	144.424	.428	.841
VAR00025	101.0833	144.265	.517	.838
VAR00026	100.4167	144.265	.430	.841
VAR00027	99.8333	146.152	.534	.838
VAR00028	100.6667	150.242	.356	.843

Appendix J

Permission Documentation for Teacher Survey Use

EMAIL:

On Fri, Apr 25, 2014 at 10:08 AM, Adrianne McGee <XXXXXXXX> wrote:
I owe you big! Thank you SO much!!!! When you get finished, I would LOVE to read your dissertation, as Shellman said ours are very similar!

From: Bill Griffin <XXXXXXXX>
Date: Friday, April 25, 2014 at 9:29 AM
To: RH3 RH3 <amcgee@rhmail.org>
Subject: Re: Teacher Survey Request - Dissertation

Adrianne McGee

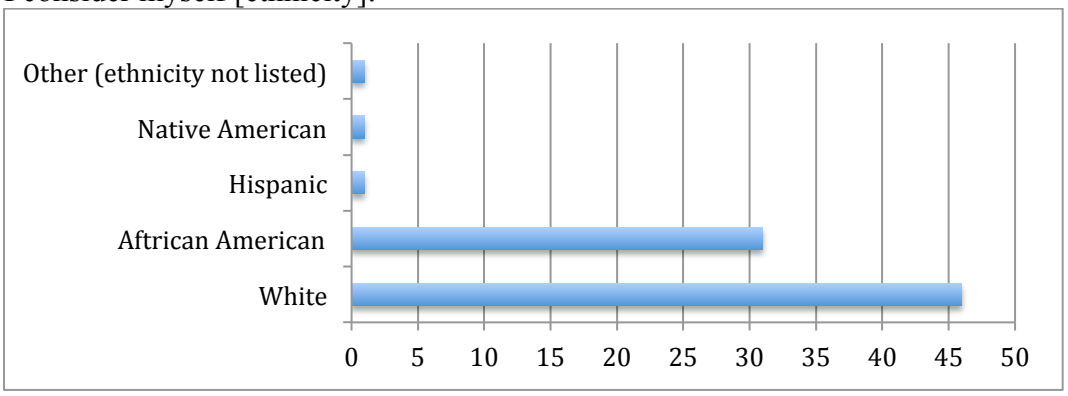
I have attached the Wang survey that I used in my study. I will also share with you the Google doc that I used for collecting my data. Good luck with your research. It's quite a process!

On Thu, Apr 24, 2014 at 2:15 PM, Adrianne McGee <XXXXXXXX> wrote:
Hi Mr. Griffin,
I am working with Dr. Shellman on my dissertation and am frantically searching for a valid teacher survey regarding technology. He told me you have a great one and suggested I contact you and request your permission to use it. Would you mind? I'm aware you are on Spring Break, but if you happen to have access, that would be amazing! Thank you so very much in advance for your consideration!
Adrianne McGee
South Pointe High School Teacher

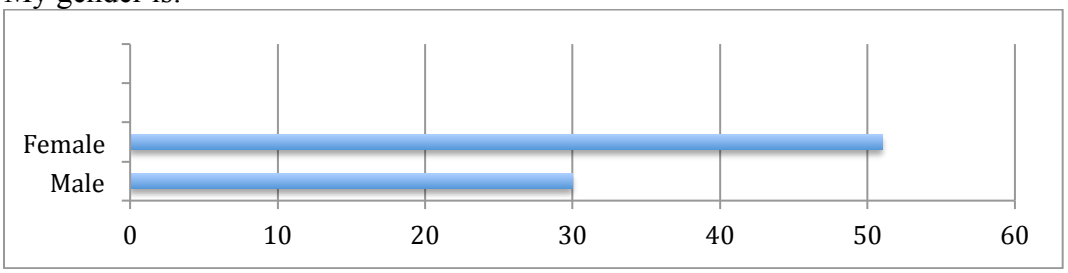
Appendix K

Student Survey Responses by Question (Graphs)

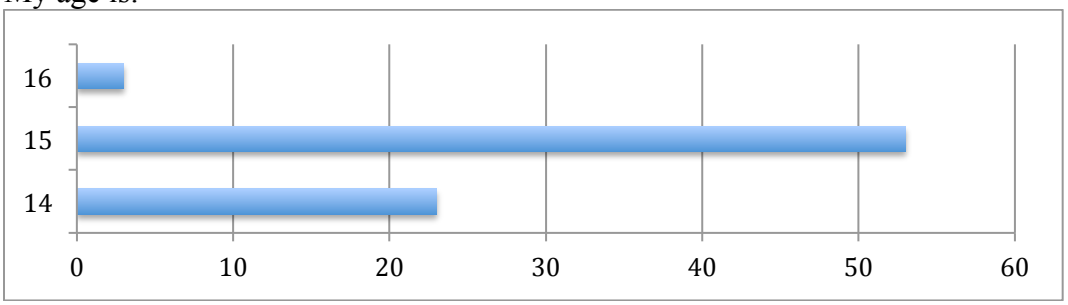
I consider myself [ethnicity]:



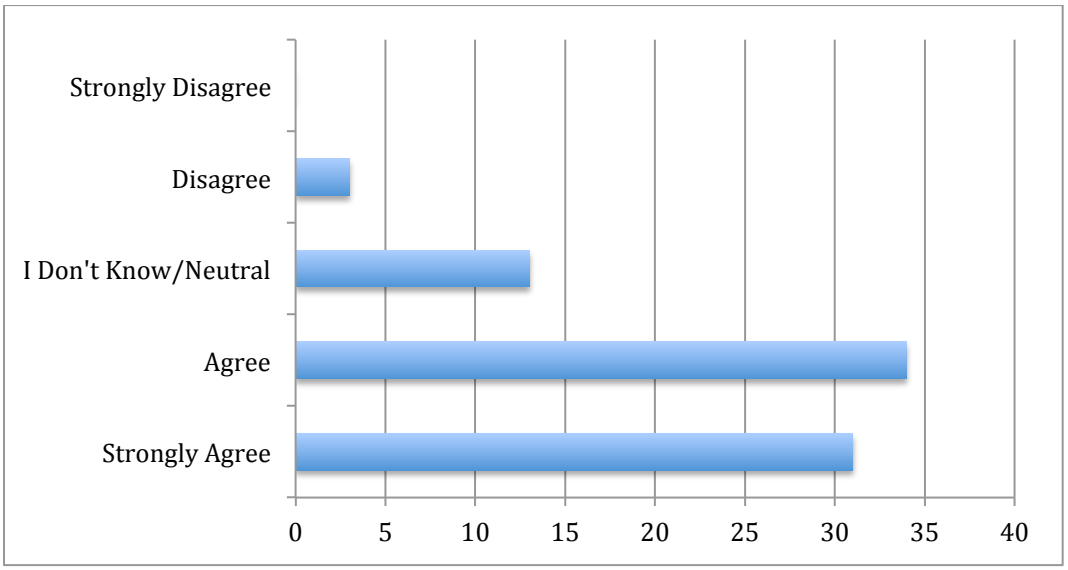
My gender is:



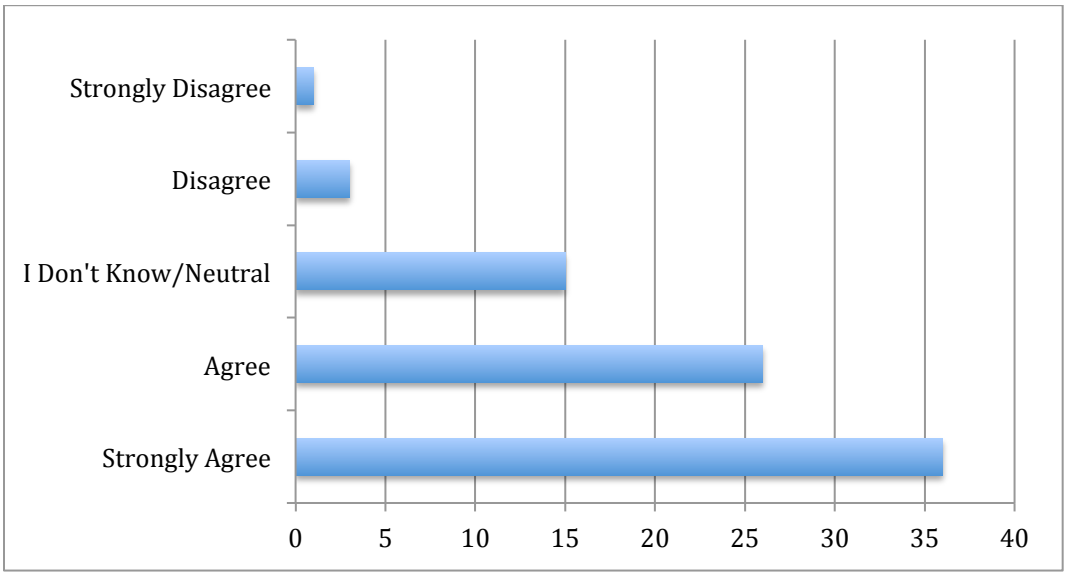
My age is:



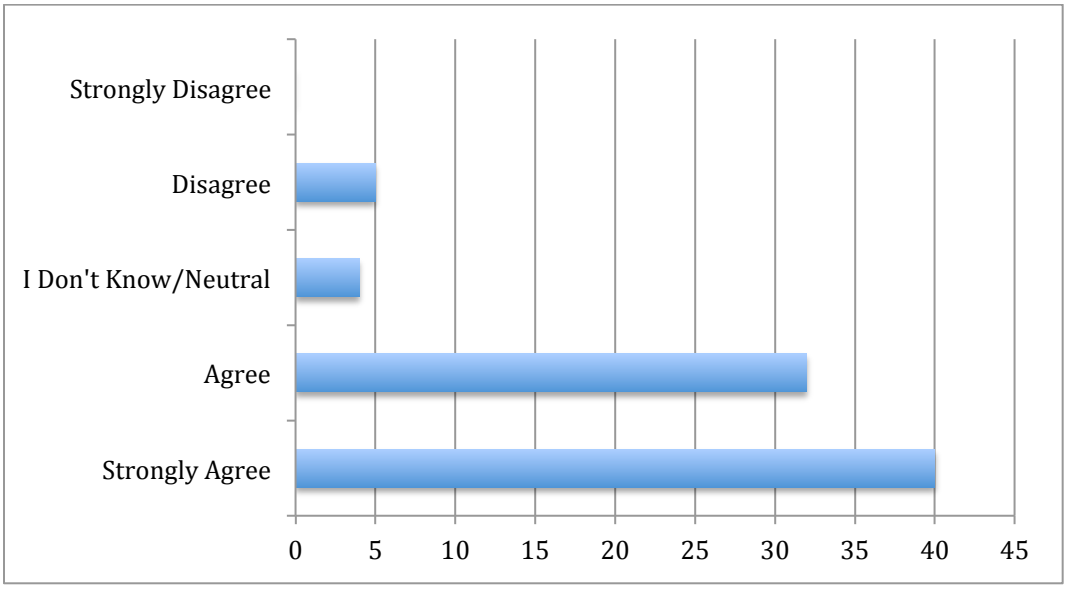
1. I felt comfortable using the iPads for school at the end of the eighth grade.



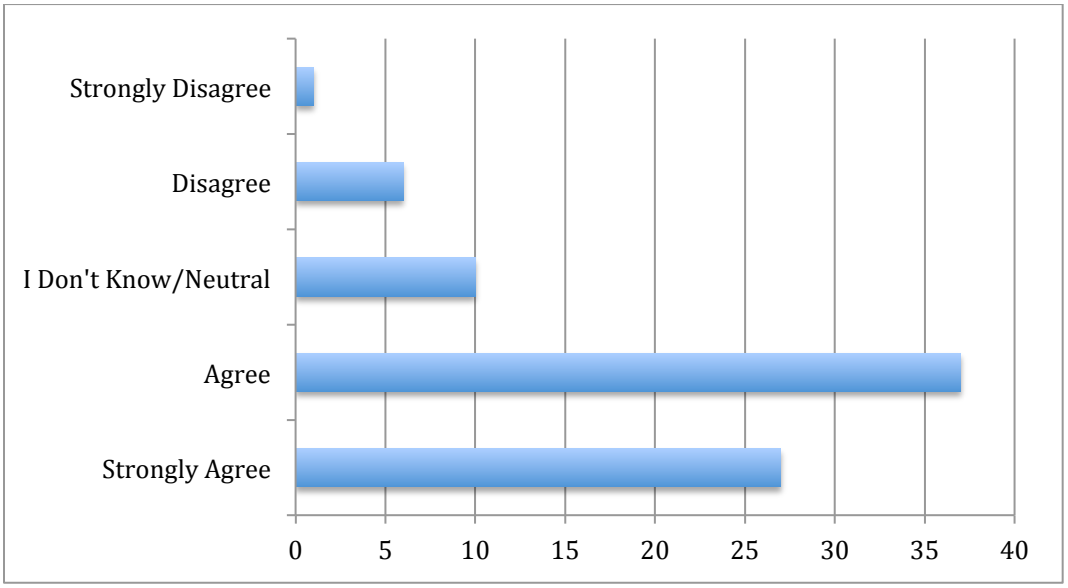
2. I enjoy the classes in which we use the iPads more than the classes in which we do not use the iPads.



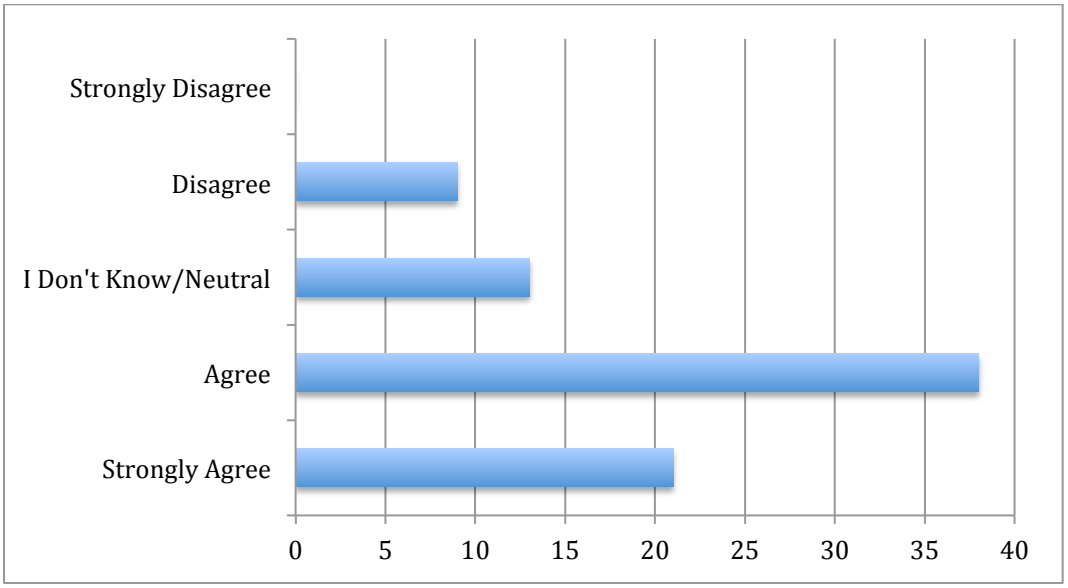
3. I can receive feedback about a document/project from a teacher and make the necessary changes using the iPad.



4. My teachers can help me when I have questions about using the iPad.

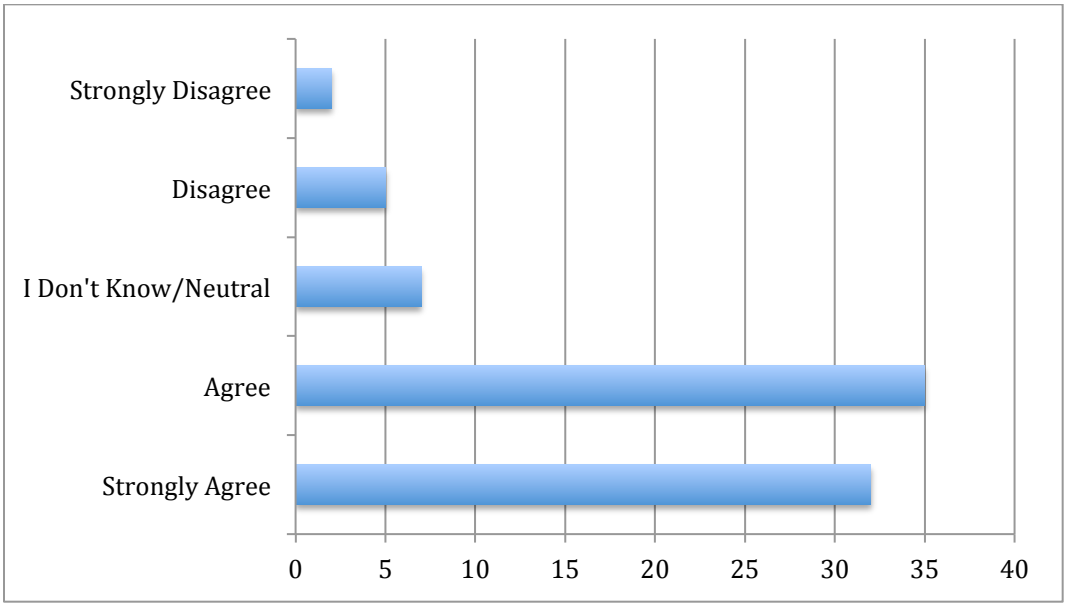


5. I feel like my teachers are comfortable using the iPads in their classrooms.

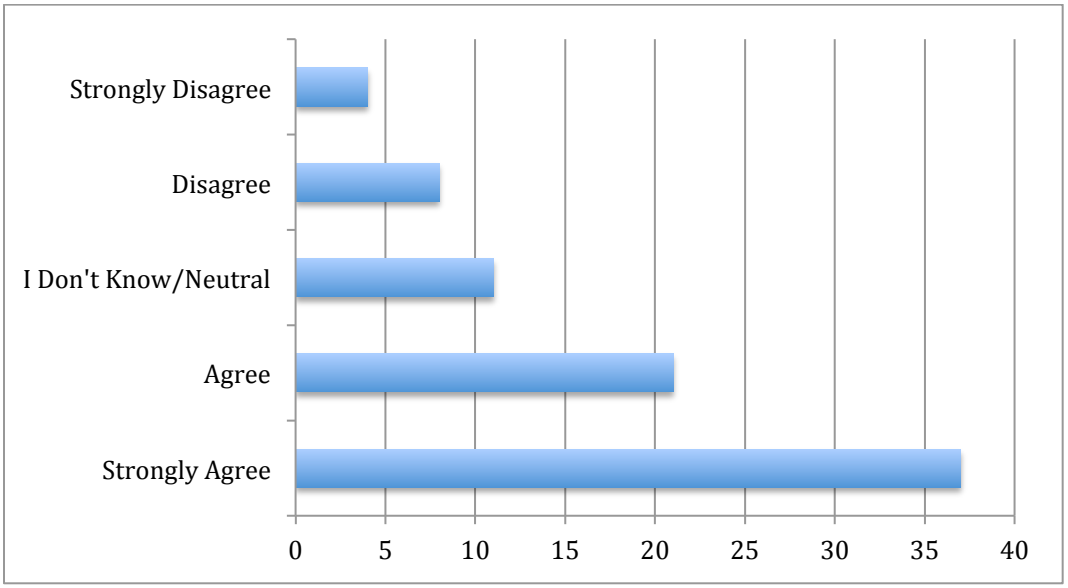


6. I feel comfortable with the ability of my teachers to use the iPads when teaching. **This question was accidentally left off the survey**

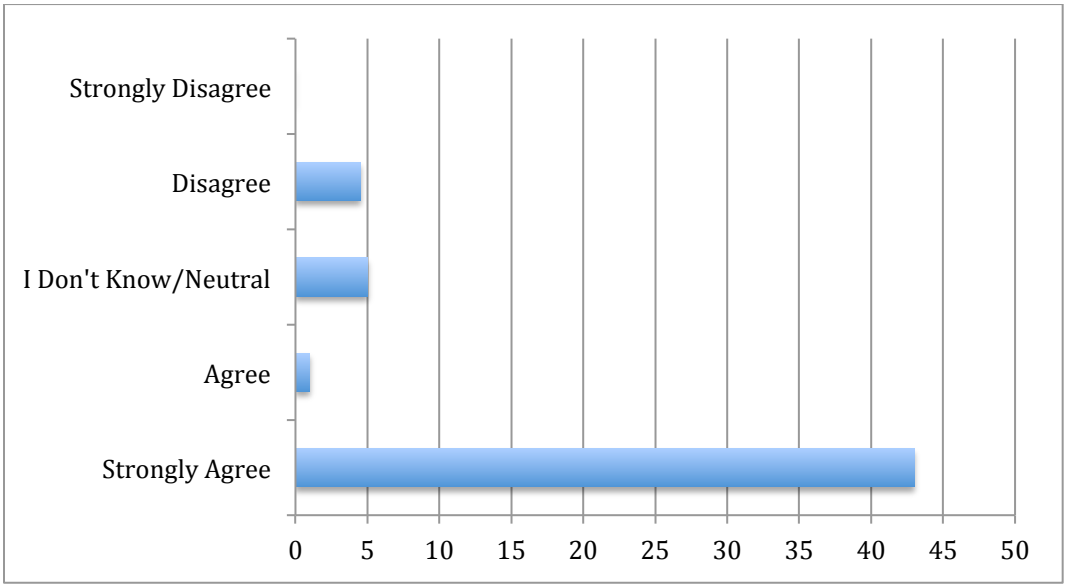
7. I feel like having the iPads in my classrooms is beneficial to my learning.



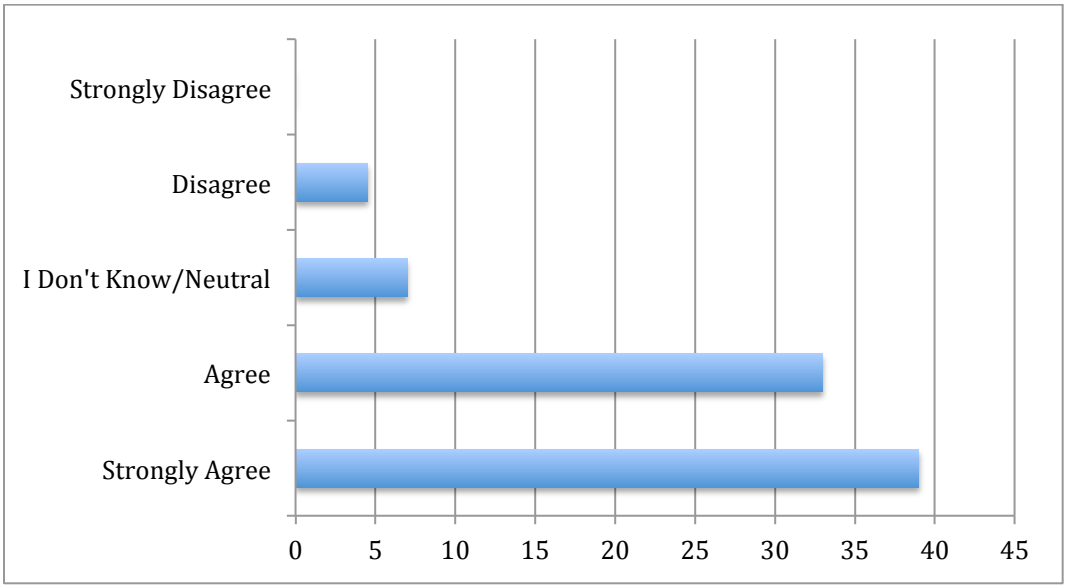
8. I feel comfortable taking tests/quizzes on the iPad.



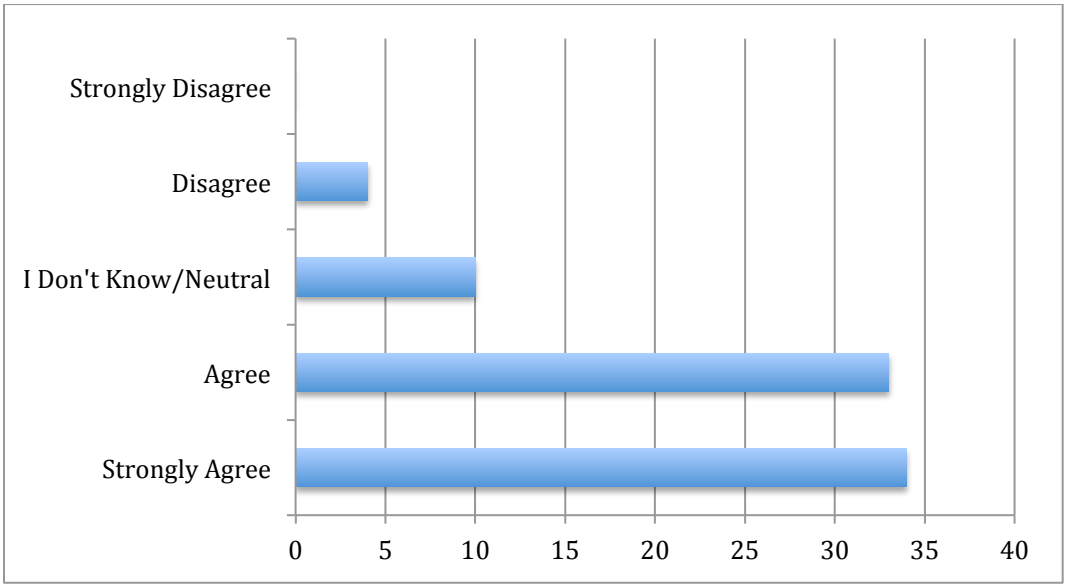
9. I can use the iPad apps easily.



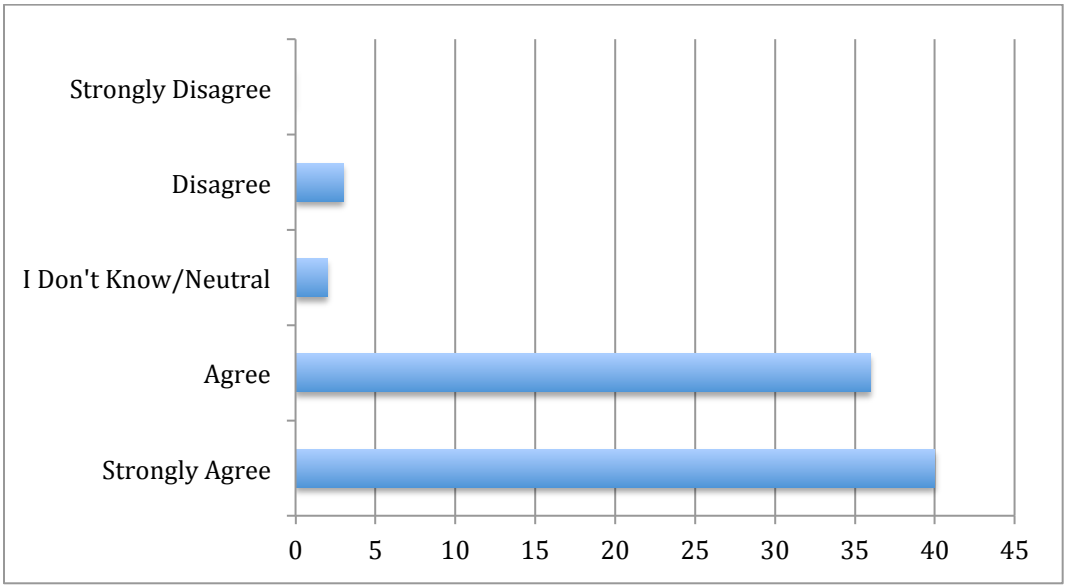
10. I can use educational apps on the iPad easily.



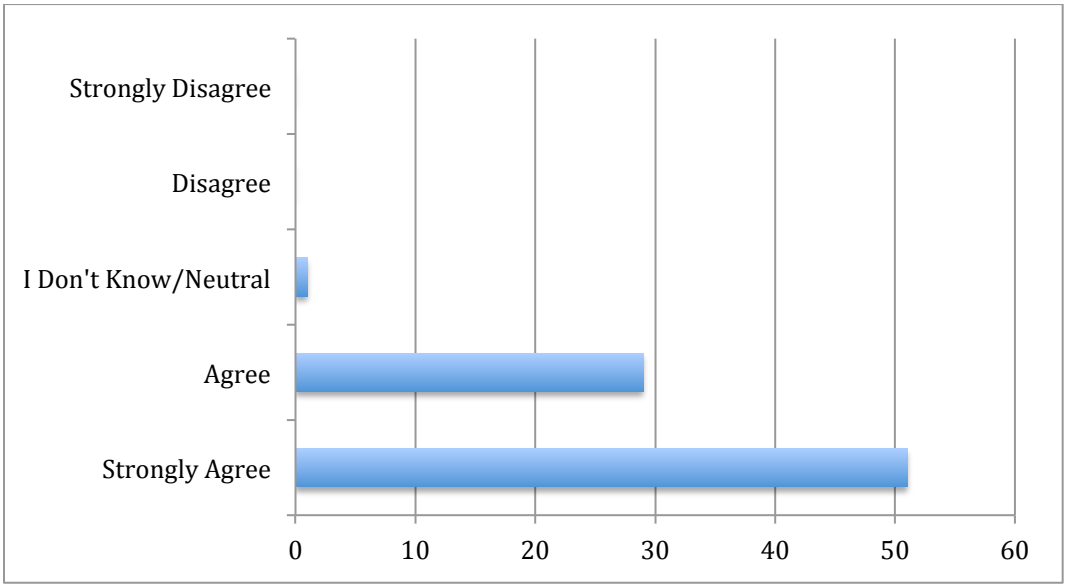
11. I can usually learn new functions on the iPad easily.



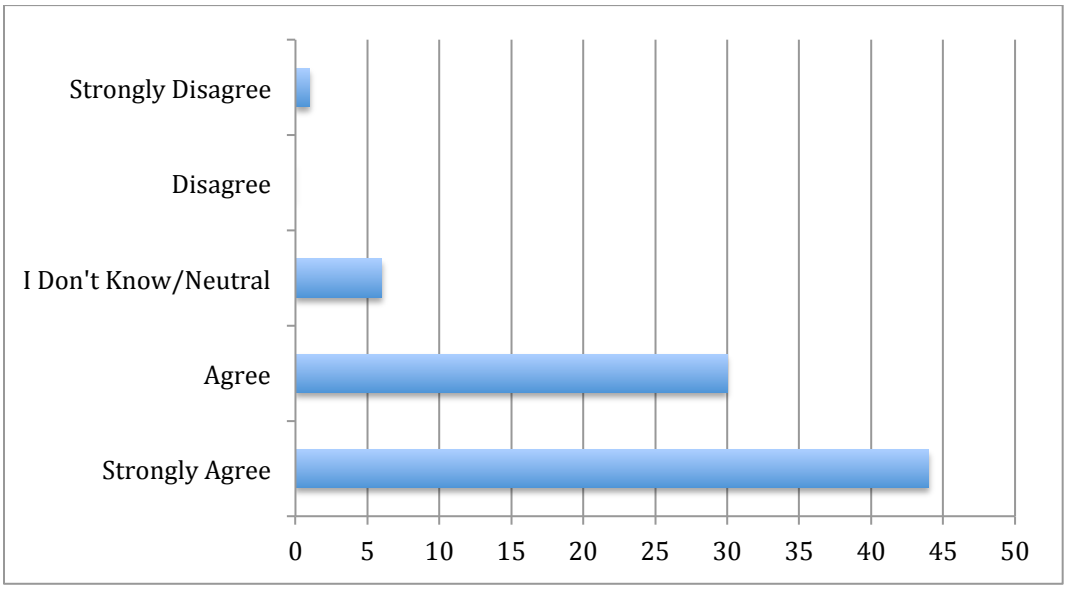
12. I feel comfortable using the Safari app on the iPad.



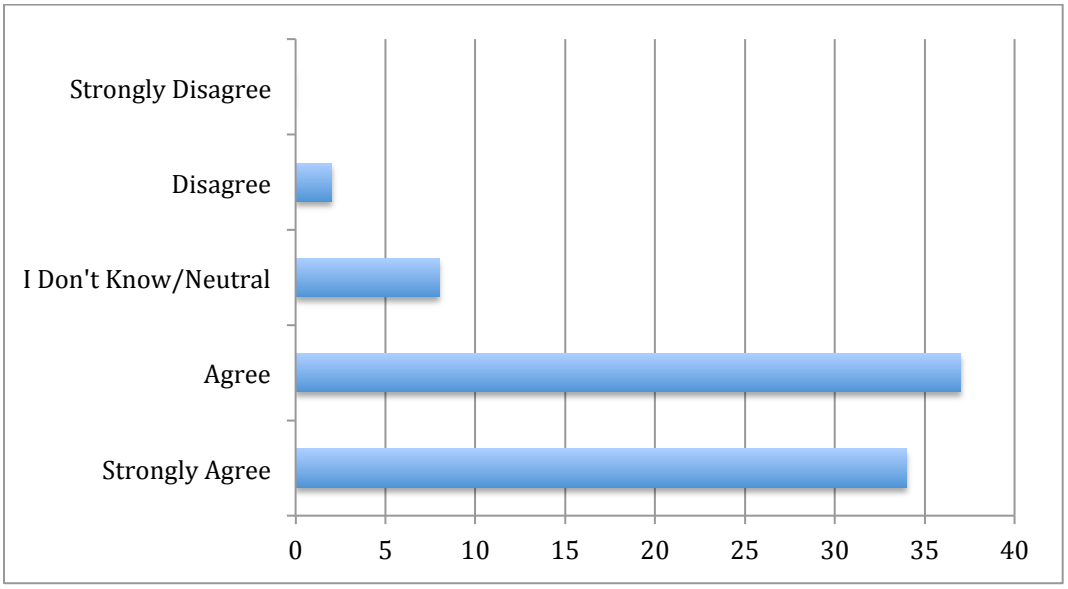
13. I can open multiple Safari web pages at one time on the iPad.



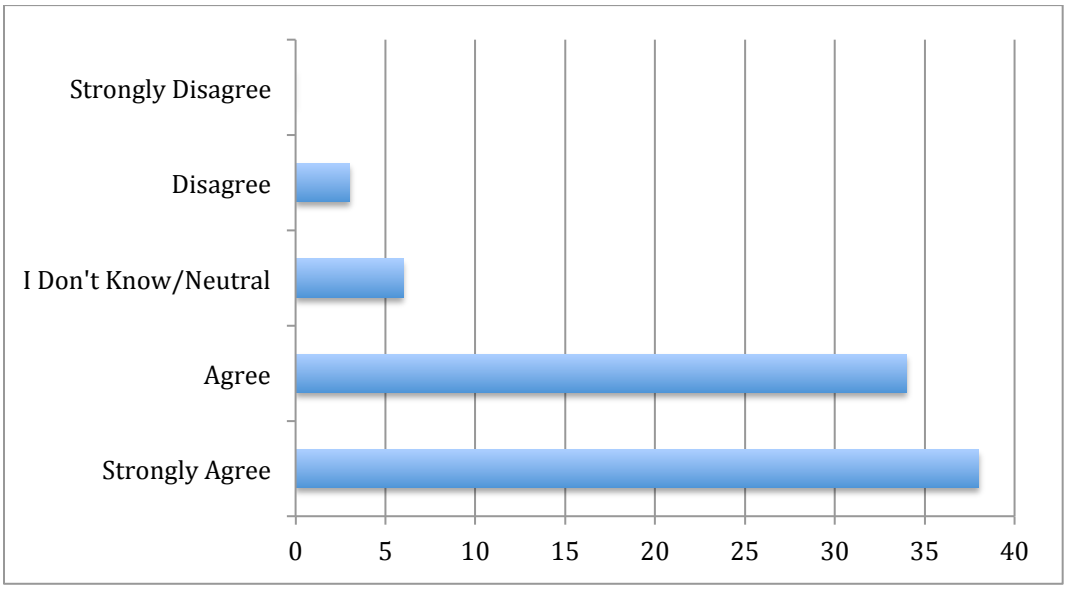
14. I can use the iPad in my classes to create projects.



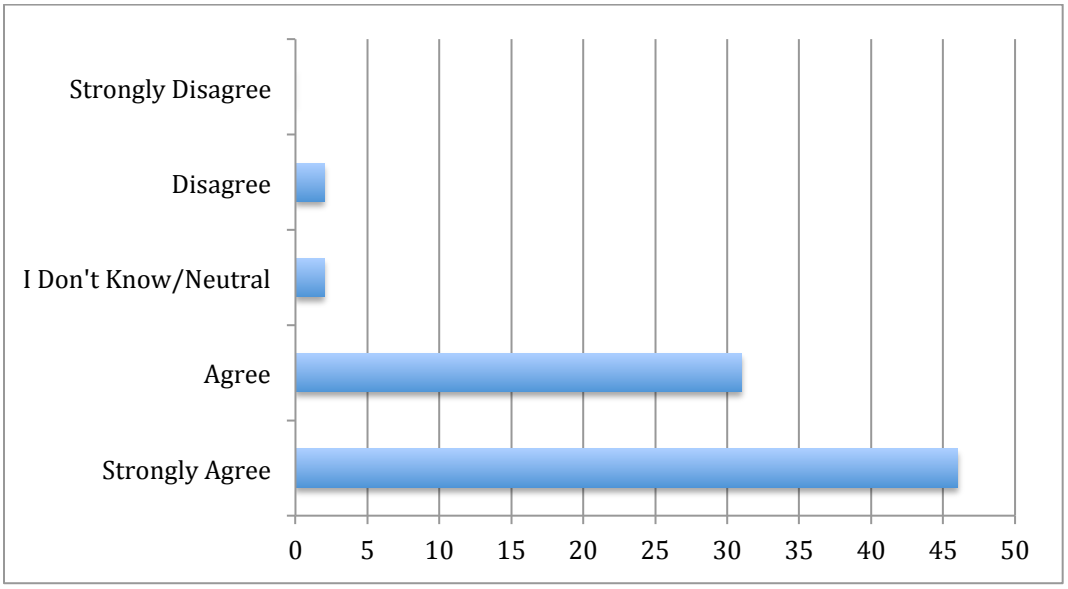
15. I can use the iPad in class to help me learn.



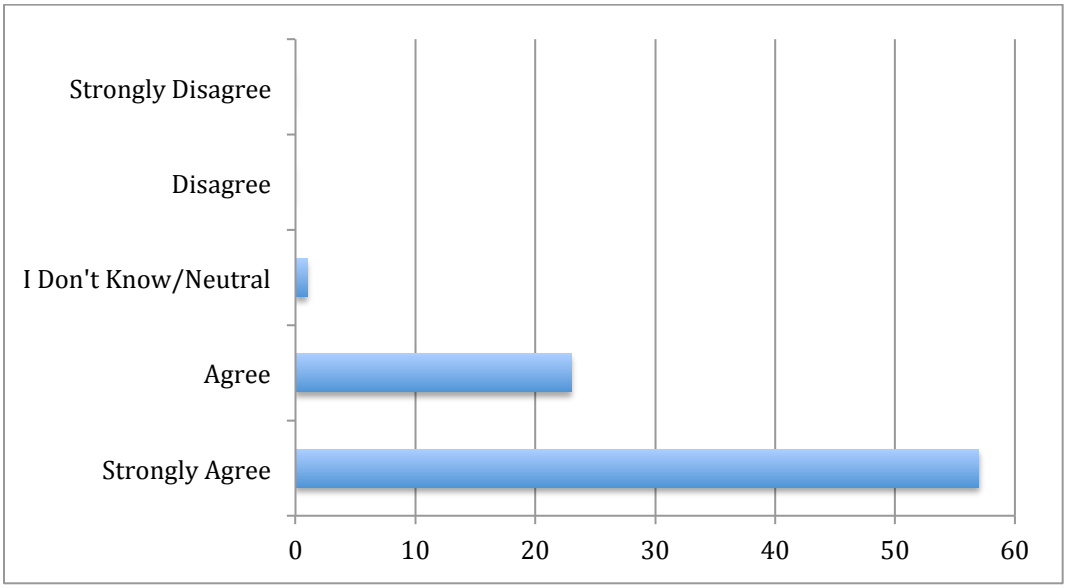
16. I can contact a teacher using the iPad.



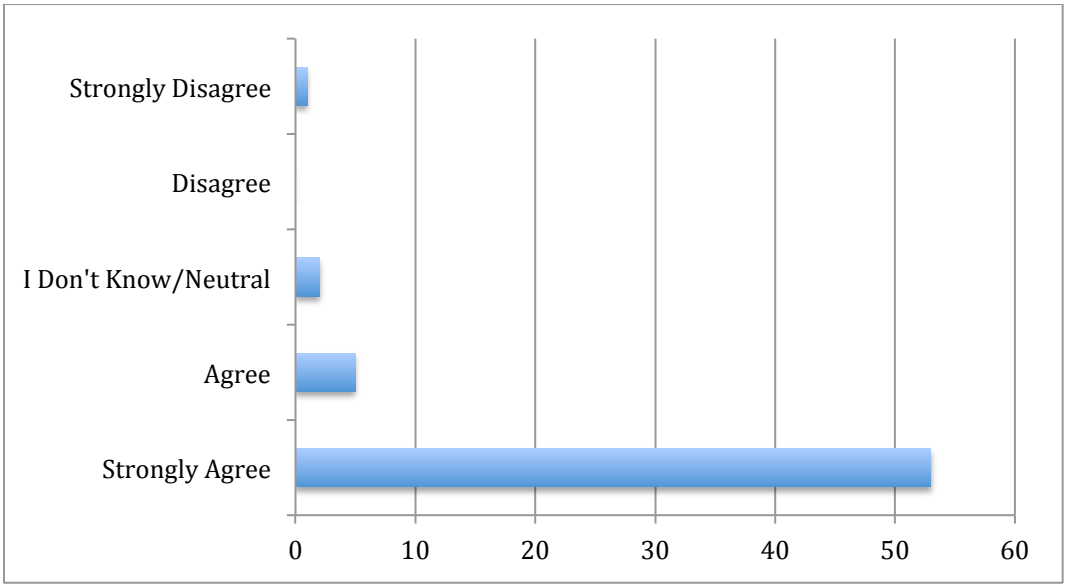
17. I can send an email using the iPad.



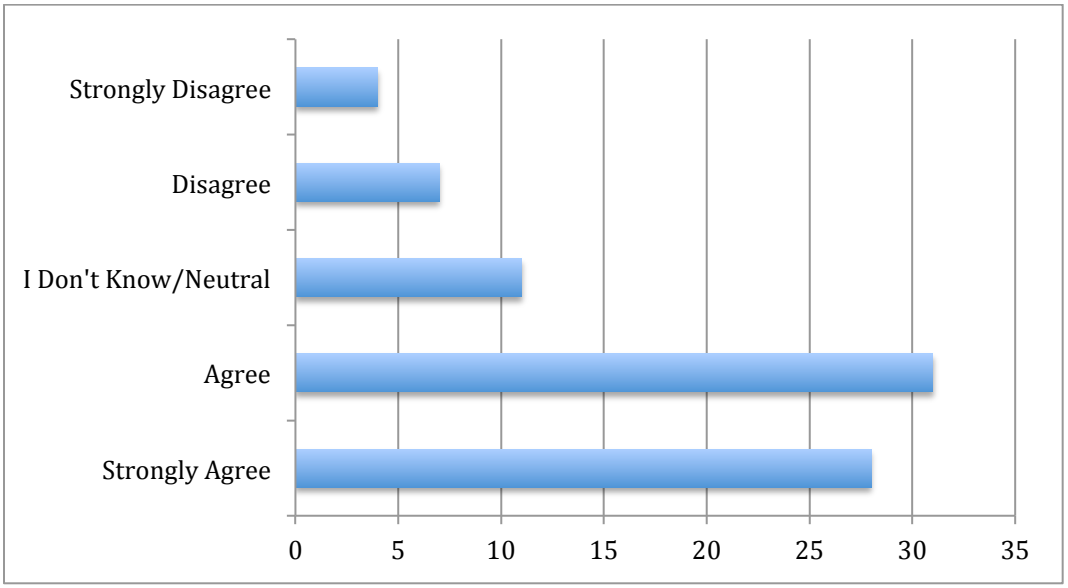
18. I can use Google Drive to create a new document on the iPad.



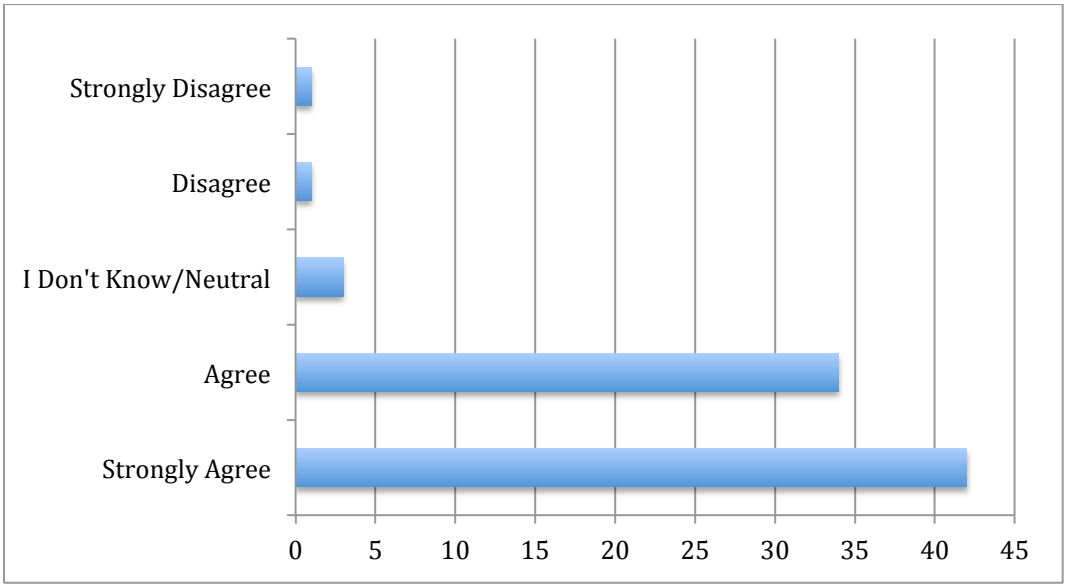
19. I can use the iPad to share a Google document with another person/teacher.



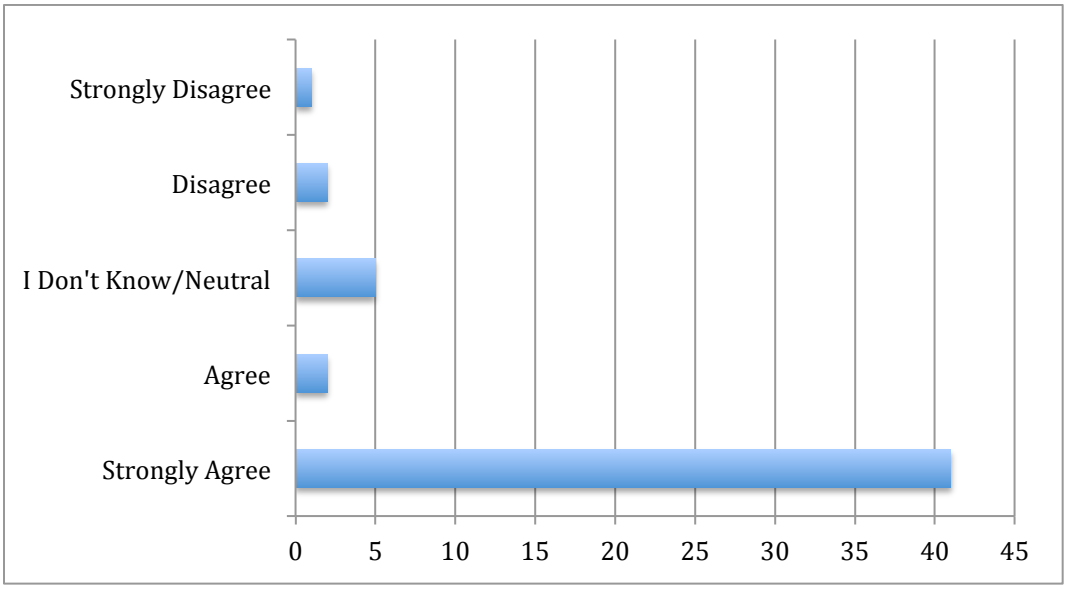
20. I can access social media (Facebook, Twitter, etc.) using the iPad.



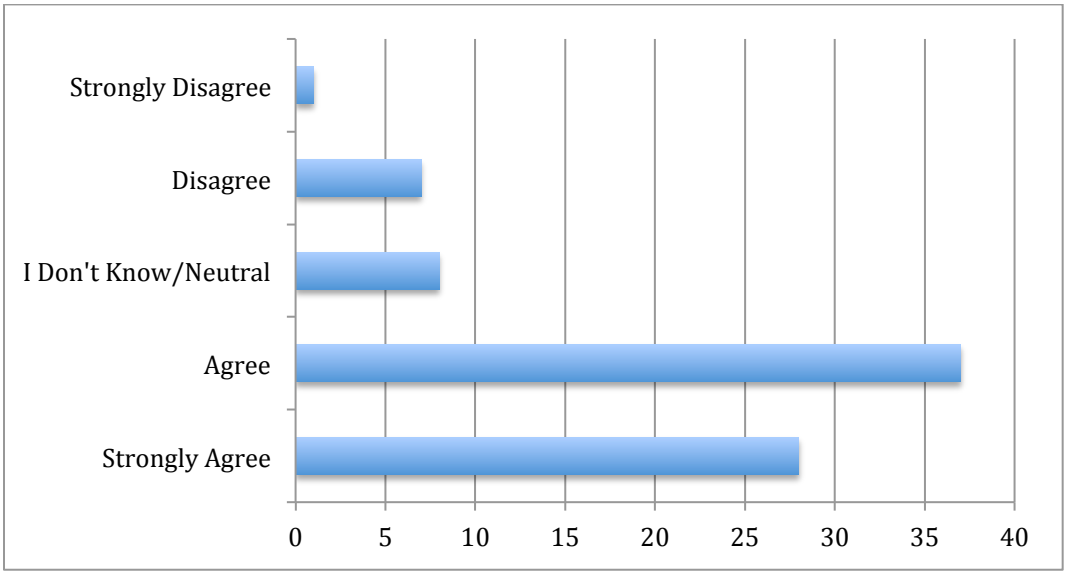
21. I can use Edmodo on the iPad for my classes.



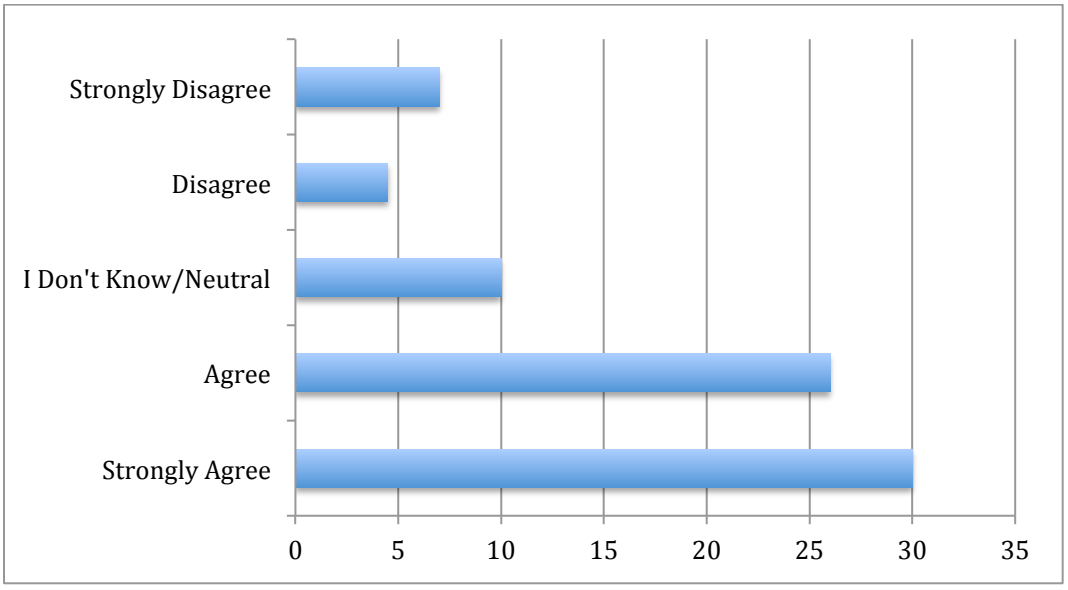
22. I feel more comfortable using the iPad after having them in my ninth-grade classes this year.



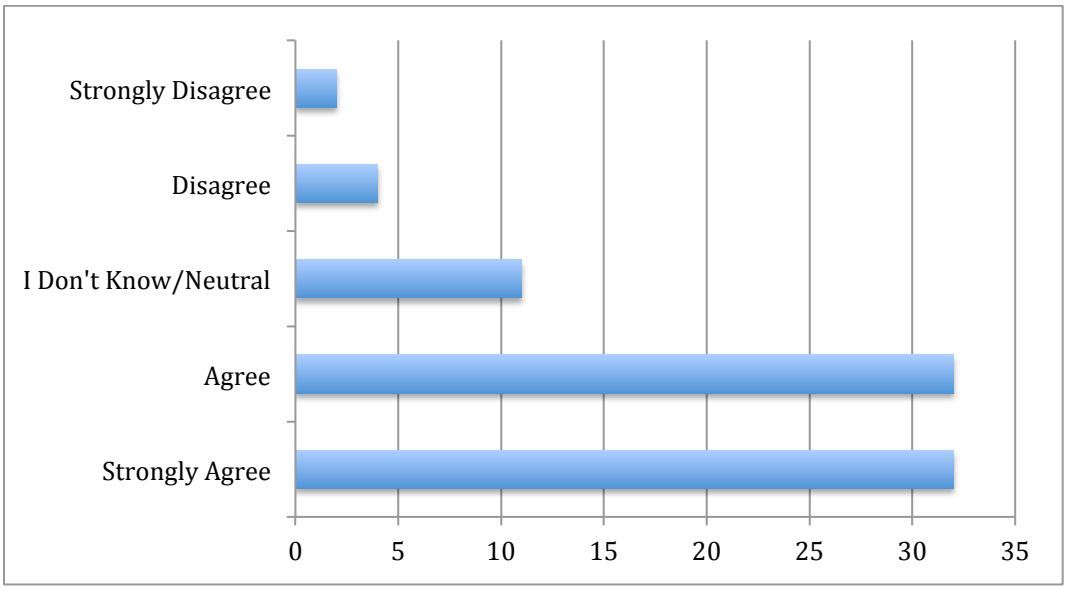
23. I can usually resolve problems with my iPad.



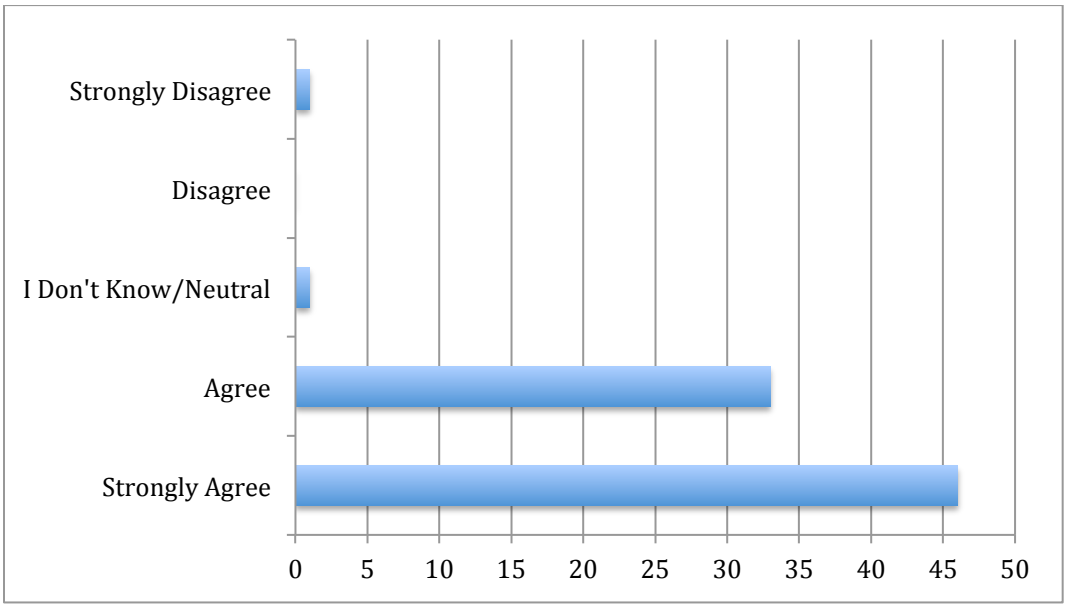
24. I feel comfortable using the iPad in my Math class.



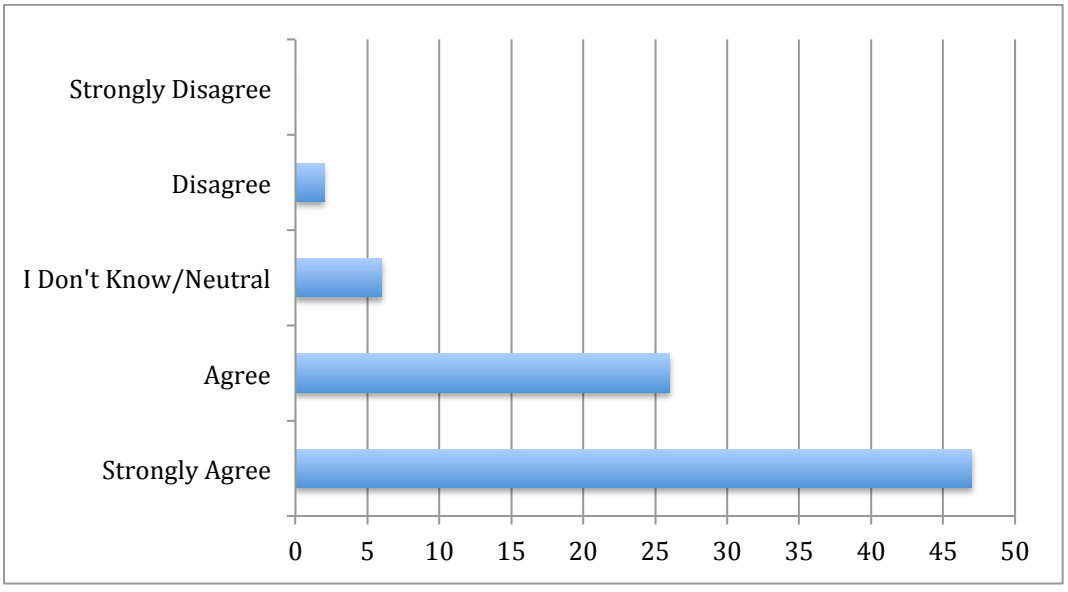
25. I feel comfortable using the iPad in my Science class.



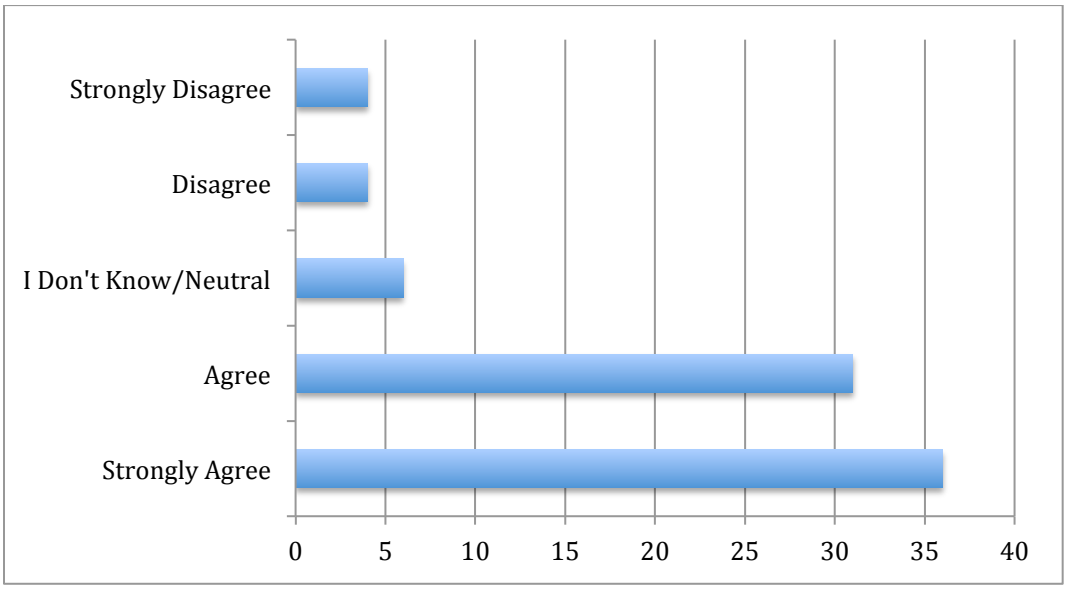
26. I feel comfortable using the iPad in my English class.



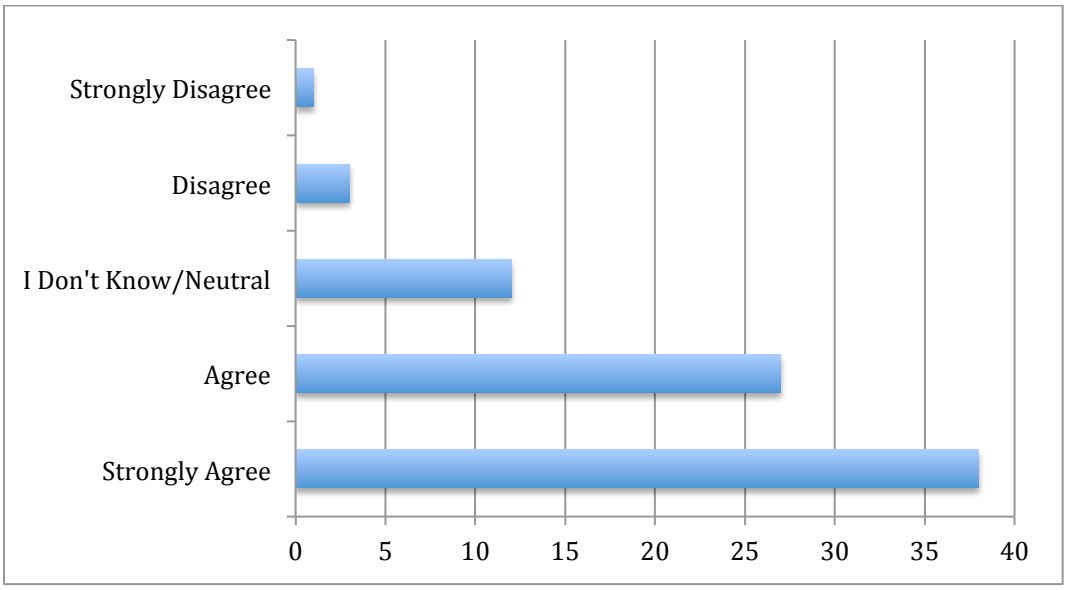
27. I feel comfortable using the iPad in my elective classes (South Pointe 101, Spanish, etc.).



28. I feel comfortable using the iPad in my Social Studies class.



29. I believe having the iPad has made me more comfortable using technology.



30. What do you think South Pointe High School teachers and principals could have done to make iPads easier to use in the classroom this year?
    - Educate teachers about technology
    - Maybe they could have had like a class period where they taught us how to use it
    - I think that maybe they could let us keep them a little longer than May because we still have projects due
    - I can't really think of anything/Nothing
    - They did everything correctly i feel like this is a great opportunity to help students learn
    - The teachers should know how to use them
    - Be sure that they know what exactly to do on the iPad with that certain assignment before they give it to us.
    - I think that they could have found more online books
    - I think pre training before school starts would've been helpful!
    - Teach a I pad usage class
    - Let us pick them up at the beginning of the day and turn them in so we aren't wasting time signing into everything in our classes that we go to
    - I think they could have had a lesson and reached us things about the iPad because I'm still struggling to do projects on iPads
    - Make it cheaper for students to buy an iPad
    - Let us use it more to get the hang of it
    - Providing everyone with a personal one
    - Do a tutorial session
    - Not blocked so much stuff
    - Nothing. The way they have it set up made it easy to use them. I don't think there is any easier way honestly
    - Having them already out for us
    - Tell us more about it
    - They did a good job I did not see anything wrong
    - The teachers have learned more about the iPads so they can help people with problems
    - Let everyone get one! It isn't fair if you can't afford it
    - Not immediately jump right into using them everyday with everything, start out slow so we can get used to it and learn how to use it
    - More activities with the ipads
    - Helping everyone out with questions and helping them understand things more better
    - Not use them so much
    - Add more lessons

- Research on how to use them better so when the student has issues with the I pad they could answer any questions.
- Introduce teachers to some more ways to use them in a classroom environment
- I think that paper is a better learning tool than iPads. We should use paper to take notes and do assignments because it is easier to understand and better to use and to help us learn.
- They could have made it to where all teachers have to use them some teachers refuse to let us use them in class
- They have allowed us to take them home and use them as a personal I pad. This lets us do more things with them.
- I believe that teachers could have all used the same apps (edmodo/google drive) so that all students could know how to do the necessary projects for class.
- They could get more iPads so that you could allow all of the students to have an iPad instead of just the freshman
- Have them teach us how to go back on quizzes or tests
- Some things should be done on paper. Because some things are more complicated on the iPads when you can easily do them on paper
- I liked everything that they did this year with the IPads
- Everything they did was great, they taught us how to use it, and to make it function.
- Stop trying to be so complex and high tech when it can just be neutral
- Show us more ways we can use them
- Take off the restrictions, one of the websites it usually use for reading was blocked and because if it my assignment was late.
- Nothing, usually students are self-teaching each other by exploring through the iPads. Teens, 9th graders, usually do not have trouble with he iPads unless they need help with certain apps.
- I feel that the principals and teachers could have done a brief overview with the students.

31. Please feel free to add any comments about using iPads in the SPHS classrooms here:
    - I like using them but then it's a confusing benefit at the same time.
    - I would just like to say thanks to mrs.McGee the most because she took so much time out to help us with the iPads.
    - More device time
    - I think that they should buy us iPads that we can have
    - I took ALL my notes on my iPad. And I'm guessing they didn't think about that we have exams on the last day of school . So how am I supposed to study if they take up the iPads before my exams ?
    - I'm not getting anything out of this.
    - They are only used in a few classes, not all.

- I feel like something easier to type on
- I think we were fine without iPads
- It is a convenient way to research in class.
- They save paper and are easy to use
- They shouldn't have taken the restrictions to the point they did we can do very little fun stuff on them
- We depend on the iPads too much. We shouldn't have to use the iPads for email, textbooks, etc. a computer would be a better leading tool in the classroom than the iPad.
- I don't like using them for every assignment
- I think the teachers should get more interactive with them to gain more intel about them.
- The ipads are easy to use, it's just hard to learn via iPad. I'd rather listen to a teacher teach me, instead of read a few articles on the iPad and then answer questions on it. It effected my grade, because I was practically teaching myself.
- Sometimes the teachers like to add more work cause they think on iPads are easier but sometimes it's easier to just use paper & pencils
- iPads are easy to use and better the pencil and paper
- Fun
- I feel that all grades should have I pads that students can take home
- I don't like the discovery education book/app and I think it would be easier to use a device with an actual keyboard on it(laptop)
- I like using them
- I love using my ipad
- We'll they are useful but not for all things, some websites require adobe flash player and iPads couldn't get that so some teachers had to change plans
- Using the iPads was very helpful and beneficial this year. Most teachers were on board. However, one of my teachers didn't use them at all! She stated "she didn't believe in them" I think all teachers should embrace the iPads and iRock initiative wether the like it or not!!!
- We should have more freedom. We should also be able to use them more often.
- They have a few issues with office documents.
- They make everything a lot easier and allow me to get more work done at times when I wouldn't normally be able to get it done without the iPad. It allows me to work on different essays and projects in class so there isn't as much work once I get home.
- They attempted to take them up very early in the year while we still needed them

Appendix L

Student Survey Responses by Question (Charts)

I consider myself [ethnicity]:

White	46
African American	31
Hispanic	1
Native American	1
Other/Ethnicity not Listed	2

My gender is:

Male	30
Female	51

My age is:

14 years old	25
15 years old	53
16 years old	3

1. I felt comfortable using the iPads for school at the end of the eighth grade.

Strongly Agree	31
Agree	34
I Don't Know/Neutral	13
Disagree	3
Strongly Disagree	0

2. I enjoy the classes in which we use the iPads more than the classes in which we do not use the iPads.

Strongly Agree	36
Agree	26
I Don't Know/Neutral	15
Disagree	3
Strongly Disagree	1

3. I can receive feedback about a document/project from a teacher and make the necessary changes using the iPad.

Strongly Agree	40
Agree	32
I Don't Know/Neutral	4
Disagree	5
Strongly Disagree	0

4. My teachers can help me when I have questions about using the iPad.

Strongly Agree	27
Agree	37
I Don't Know/Neutral	10
Disagree	6
Strongly Disagree	1

5. I feel like my teachers are comfortable using the iPads in their classrooms.

Strongly Agree	21
Agree	38
I Don't Know/Neutral	13
Disagree	9
Strongly Disagree	0

6. I feel comfortable with the ability of my teachers to use the iPads when teaching.
   This question was accidentally left off the survey

7. I feel like having the iPads in my classrooms is beneficial to my learning.

Strongly Agree	32
Agree	35
I Don't Know/Neutral	7
Disagree	5
Strongly Disagree	2

8. I feel comfortable taking tests/quizzes on the iPad.

Strongly Agree	37
Agree	21
I Don't Know/Neutral	11
Disagree	8
Strongly Disagree	4

9. I can use the iPad apps easily.

Strongly Agree	43
Agree	31
I Don't Know/Neutral	5
Disagree	2
Strongly Disagree	0

10. I can use educational apps on the iPad easily.

Strongly Agree	39
Agree	33
I Don't Know/Neutral	7
Disagree	2
Strongly Disagree	0

11. I can usually learn new functions on the iPad easily.

Strongly Agree	34
Agree	33
I Don't Know/Neutral	10
Disagree	4
Strongly Disagree	0

12. I feel comfortable using the Safari app on the iPad.

Strongly Agree	40
Agree	36
I Don't Know/Neutral	2
Disagree	3
Strongly Disagree	0

13. I can open multiple Safari web pages at one time on the iPad.

Strongly Agree	51
Agree	29
I Don't Know/Neutral	1
Disagree	0
Strongly Disagree	0

14. I can use the iPad in my classes to create projects.

Strongly Agree	44
Agree	30
I Don't Know/Neutral	6
Disagree	0
Strongly Disagree	1

15. I can use the iPad in class to help me learn.

Strongly Agree	34
Agree	37
I Don't Know/Neutral	8
Disagree	2
Strongly Disagree	0

16. I can contact a teacher using the iPad.

Strongly Agree	38
Agree	34
I Don't Know/Neutral	6
Disagree	3
Strongly Disagree	0

17. I can send an email using the iPad.

Strongly Agree	46
Agree	31
I Don't Know/Neutral	2
Disagree	2
Strongly Disagree	0

18. I can use Google Drive to create a new document on the iPad.

Strongly Agree	57
Agree	23
I Don't Know/Neutral	1
Disagree	0
Strongly Disagree	0

19. I can use the iPad to share a Google document with another person/teacher.

Strongly Agree	53
Agree	25
I Don't Know/Neutral	2
Disagree	0
Strongly Disagree	1

20. I can access social media (Facebook, Twitter, etc.) using the iPad.

Strongly Agree	28
Agree	31
I Don't Know/Neutral	11
Disagree	7
Strongly Disagree	4

21. I can use Edmodo on the iPad for my classes.

Strongly Agree	42
Agree	34
I Don't Know/Neutral	3
Disagree	1
Strongly Disagree	1

22. I feel more comfortable using the iPad after having them in my ninth-grade classes this year.

Strongly Agree	41
Agree	32
I Don't Know/Neutral	5
Disagree	2
Strongly Disagree	1

23. I can usually resolve problems with my iPad.

Strongly Agree	28
Agree	37
I Don't Know/Neutral	8
Disagree	7
Strongly Disagree	1

24. I feel comfortable using the iPad in my Math class.

Strongly Agree	30
Agree	26
I Don't Know/Neutral	10
Disagree	8
Strongly Disagree	7

25. I feel comfortable using the iPad in my Science class.

Strongly Agree	32
Agree	32
I Don't Know/Neutral	11
Disagree	4
Strongly Disagree	2

26. I feel comfortable using the iPad in my English class.

Strongly Agree	46
Agree	33
I Don't Know/Neutral	1
Disagree	0
Strongly Disagree	1

27. I feel comfortable using the iPad in my elective classes (South Pointe 101, Spanish, etc.).

Strongly Agree	47
Agree	26
I Don't Know/Neutral	6
Disagree	2
Strongly Disagree	0

28. I feel comfortable using the iPad in my Social Studies class.

Strongly Agree	36
Agree	31
I Don't Know/Neutral	6
Disagree	4
Strongly Disagree	4

29. I believe having the iPad has made me more comfortable using technology.

Strongly Agree	38
Agree	27
I Don't Know/Neutral	12
Disagree	3
Strongly Disagree	1

30. What do you think South Pointe High School teachers and principals could have done to make iPads easier to use in the classroom this year?
    - Educate teachers about technology
    - Maybe they could have had like a class period where they taught us how to use it
    - I think that maybe they could let us keep them a little longer than May because we still have projects due
    - I can't really think of anything/Nothing
    - They did everything correctly i feel like this is a great opportunity to help students learn
    - The teachers should know how to use them
    - Be sure that they know what exactly to do on the iPad with that certain assignment before they give it to us.
    - I think that they could have found more online books
    - I think pre training before school starts would've been helpful!
    - Teach a I pad usage class
    - Let us pick them up at the beginning of the day and turn them in so we aren't wasting time signing into everything in our classes that we go to
    - I think they could have had a lesson and reached us things about the iPad because I'm still struggling to do projects on iPads
    - Make it cheaper for students to buy an iPad
    - Let us use it more to get the hang of it
    - Providing everyone with a personal one
    - Do a tutorial session
    - Not blocked so much stuff
    - Nothing. The way they have it set up made it easy to use them. I don't think there is any easier way honestly
    - Having them already out for us
    - Tell us more about it
    - They did a good job I did not see anything wrong
    - The teachers have learned more about the iPads so they can help people with problems
    - Let everyone get one! It isn't fair if you can't afford it

- Not immediately jump right into using them every day with everything, start out slow so we can get used to it and learn how to use it
- More activities with the ipads
- Helping everyone out with questions and helping them understand things more better
- Not use them so much
- Add more lessons
- Research on how to use them better so when the student has issues with the I pad they could answer any questions.
- Introduce teachers to some more ways to use them in a classroom environment
- I think that paper is a better learning tool than iPads. We should use paper to take notes and do assignments because it is easier to understand and better to use and to help us learn.
- They could have made it to where all teachers have to use them some teachers refuse to let us use them in class
- They have allowed us to take them home and use them as a personal I pad. This lets us do more things with them.
- I believe that teachers could have all used the same apps (edmodo/google drive) so that all students could know how to do the necessary projects for class.
- They could get more iPads so that you could allow all of the students to have an iPad instead of just the freshman
- Have them teach us how to go back on quizzes or tests
- Some things should be done on paper. Because some things are more complicated on the iPads when you can easily do them on paper
- I liked everything that they did this year with the IPads
- Everything they did was great, they taught us how to use it, and to make it function.
- Stop trying to be so complex and high tech when it can just be neutral
- Show us more ways we can use them
- Take off the restrictions, one of the websites it usually use for reading was blocked and because if it my assignment was late.
- Nothing, usually students are self-teaching each other by exploring through the iPads. Teens, 9th graders, usually do not have trouble with the iPads unless they need help with certain apps.
- I feel that the principals and teachers could have done a brief overview with the students.

31. Please feel free to add any comments about using iPads in the SPHS classrooms here:

- I like using them but then it's a confusing benefit at the same time.
- I would just like to say thanks to mrs.McGee the most because she took so much time out to help us with the iPads.
- More device time
- I think that they should buy us iPads that we can have
- I took ALL my notes on my iPad. And I'm guessing they didn't think about that we have exams on the last day of school . So how am I suppose to study if they take up the iPads before my exams ?
- I'm not getting anything out of this.
- They are only used in a few classes, not all.
- I feel like something easier to type on
- I think we were fine without iPads
- It is a convenient way to research in class.
- They save paper and are easy to use
- They shouldn't have taken the restrictions to the point they did we can do very little fun stuff on them
- We depend on the iPads to much. We shouldn't have to use the iPads for email, textbooks, etc. a computer would be a better leading tool in the classroom than the iPad.
- I don't like using them for every assignment
- I think the teachers should get more interactive with them to gain more intel about them.
- The ipads are easy to use, it's just hard to learn via iPad. I'd rather listen to a teacher teach me, instead of read a few articles on the iPad and then answer questions on it. It effected my grade, because I was practically teaching myself.
- Sometimes the teachers like to add more work cause they think on iPads are easier but sometimes it's easier to just use paper & pencils
- iPads are easy to use and better the pencil and paper
- Fun
- I feel that all grades should have I pads that students can take home
- I don't like the discovery education book/app and I think it would be easier to use a device with an actual keyboard on it(laptop)
- I like using them
- I love using my ipad
- We'll they are useful but not for all things, some websites require adobe flash player and iPads couldn't get that so some teachers had to change plans
- Using the iPads was very helpful and beneficial this year. Most teachers were on board. However, one of my teachers didn't use them at all! She stated "she didn't believe in them" I think all teachers should embrace the iPads and iRock initiative wether the like it or not!!!

- We should have more freedom. We should also be able to use them more often.
- They have a few issues with office documents.
- They make everything a lot easier and allow me to get more work done at times when I wouldn't normally be able to get it done without the iPad. It allows me to work on different essays and projects in class so there isn't as much work once I get home.
- They attempted to take them up very early in the year while we still needed them