ABSTRACT

Title of Dissertation: TEACHERS' PERCEPTIONS OF THE IMPACT
                                      OF iPAD© USE IN THE CLASSROOM ON
                                      THEIR INSTRUCTIONAL PRACTICE

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        As technology devices, access, and availability continue to grow exponentially in

our society, school systems need to align their educational resources, tools and

professional growth programs to have a positive effect on teaching and learning in

today's 21st century classroom. Studies have shown the integration of technology in the

classroom can have a positive influence on teaching and learning. The purpose of this

study was to investigate teachers' perceptions of the impact that one device, the iPad©,

can impact their instructional practice in the classroom. The goals of this study were to

determine the variety of ways that iPads© can be utilized in the classroom, types of

professional development that is valuable in technology integration and obtaining

teachers' perceptions towards the usefulness of this technology in the classroom. This

study used a known measurable tool, the SAMR model, to quantify the integration levels

of technology in the classroom. The framework of the SAMR model places technology

use into four categories: Substitution, Augmentation, Modification and Redefinition.

Modification and redefinition are the highest tiers of technology integration, which

exhibits the creation of tasks in the classroom that would not be possible without the use of technology.

This study was conducted in a private, 9-12 high school which has implemented a 1:1 iPad© program since 2013 and is located in a rural/suburban area with 99% of the students matriculating to higher education.

The findings of this study indicated a very high frequency and variation of iPad© use by teachers and students, with the majority of the teachers and students using the device everyday, mostly in the SAMR categories of substitution and augmentation. Teachers having the most total years teaching and the most years teaching with the iPad© were more likely to consider themselves above average or leaders in using technology in the classroom. Teachers that self-reported as above average or leaders in technology use also placed themselves in the two higher tiers of the SAMR scale, with Apple Educator certification being the most influential factor. In their professional development, teachers reported the use of in-house workshops as the most effective method to learn new technologies. When surveyed on the specific types of professional learning teachers needed to vary instruction, their primary response centered on receiving training on how to utilize technology to personalize learning for their students. In order to effectively use the technology in the classroom, teachers believed professional development sessions that focused on curbing student distractions were most valuable. Professional development that emphasized best practices to align the technology to their specific subject area was stated as most significant by teachers in order to increase technology integration in their classroom. Teachers felt the most positive impacts that iPads© had on their instructional practices included the increased access that students have to learn information, the ability

to create assignments that would be impossible without the technology, and the ability to vary assessments with using the iPad©. Student plagiarism was the area of most concern for teachers when surveyed on ways that the iPad© can inhibit teaching and learning. Teacher experience, certifications, frequency of technology use in the classroom, professional development, and teacher perceptions and attitudes towards technology are realized as contributing factors in technology integration in a secondary school classroom.

TEACHERS' PERCEPTIONS OF THE IMPACT OF iPAD© USE IN THE CLASSROOM ON THEIR INSTRUCTIONAL PRACTICE

By

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Dissertation submitted to the Faculty of the Graduate School of the

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Dedication

I would like to dedicate this dissertation to my family, immediate and extended. To my wife, Paula, who constantly believed in my pursuit of a terminal degree in my field. This would not have been possible without her continued support and willingness to always be there for our family, in times I had class, needed time to work on this dissertation or needed inspiration to push through to finish. This is the true form of loving your spouse unconditionally. To the best three children a father could ask for, who understood the time commitment to my vocation and furthering my education when games were missed or weekends were compromised. You truly make me proud as a dad! To my parents, who instilled the value of education and have sustained me throughout my educational journey, I am blessed to have your unending support. To my in-laws who were always there to fill in the gaps, without question, when our family needed you, most of the time at the last minute. To God, which has been a constant in my family life, work life and education. I am indebted to the spiritual direction that has reassured my education pathway. To Mary Joy Hurlburt, as an educator who has always showed continuous support, this would have not been possible without your confidence in me as an educational leader. To my colleagues in my cohort, that have provided life-long friendships, inspiration and memories that will never be forgotten. It has sincerely taken a village and I am grateful that I have had the support of my community of friends, family members and colleagues.

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SECTION I: INTRODUCTION

"The transition to pervasive computing has profound implications for education and may represent as great a paradigm shift as the invention of writing itself."
                                                            Bull, Bull, Garofolo, and Harris, 2002, pl.

Technologies such as computers and other digital devices have been used in classroom instruction for over four decades. The first portable computer, in 1981, weighed 24 pounds and cost $1,795 (Purdue, 2017). *TIME (TIME,* 1983*)* magazine named the computer its "Man of the Year" in 1982 and *TIME* declared, "It is the end result of a technological revolution that has been in the making for four decades and is now, quite literally, hitting home." Apple computers followed in 1984 with the first Mac. With the evolution of technology, new educational competencies are growing and changing exponentially. As the world of technology evolves, learning environments both in and out of the classroom will equally advance, and the need for teachers to educate themselves with the technologies will be imperative for their growth as educators.

School systems have adopted the iPad© in classrooms since its debut in April 2010. This new portable, personalized technology, when put in the hands of students and teachers, has raised questions about the device's impact on how changes in teaching are being modified by using the iPad© in the classroom. Using technology for instructional purposes may have widespread, positive effects on students as various technologies offer relevant and engaging opportunities for meaningful learning experiences (Shell, et al., 2005). Generationally, students in school today are digital natives and may benefit from learning using familiar mediums they use outside of the school day. Teachers can capitalize on integrating technology resources into their classroom instruction but may be hesitant based on their lack of knowledge and confidence in using technology (Kellenberger, 2003).

Implementing a technology such as providing every student with their own iPad© can represent a major shift in how teachers' plan and deliver instruction, engage students and assess learning. However, since the inception of the iPad© in the marketplace has been less than a decade, (Tay and Wang, 2016) state, "there is relatively little empirical data of their impact on teaching and learning.

Problem Statement and Need for Study

This study was conducted in a suburban/rural private secondary school, grades 9-12, that implemented a 1:1 iPad© program beginning in August 2013 with faculty who teach in core content areas receiving iPads© in June of 2012. The teachers studied span subject areas that are common to a private, religious high school curriculum: English, math, history, science, theology, computer sciences, world languages, and fine arts. Resources, professional development time, and over $30,000 in hardware/software costs were allocated in the initial year to support the 1:1 program. From the initial implementation in 2013 to the present, significant costs have been associated with funding the 1:1 program. These include hiring a part-time administrator to support teachers in using technology, outsourcing the running of the network to an educational technology firm, and continued in-house and outside conferences and workshops to sustain best practices in implementing technology in the classroom. Each student is responsible for purchasing and maintaining their iPad© for the four years they attend high school, which increases their family's financial obligation $500-$700 dollars above the current tuition cost. Although the 1:1 program seems to be succeeding, there is a lack of measurable data on how the iPad© affects teaching at this high school. This study will examine if the iPad© increases teachers' depth of instructional use of technology in the classroom. The school has not conducted a formalized study or evaluation of the effects of using the iPad© in the classroom. There is an

essential need for parents, students, and teachers as stakeholders to understand the burgeoning educational benefits of the iPad© as a classroom tool.

Money, professional development time, and educational time are being used to integrate the iPad© into educational institutions across the globe (Leonard, 2013). Studies such as this, ones that examine the benefits, as well as obstacles, to integrated tablet technology in the classroom will aid those that currently use iPads© and those that are researching the need for implementing a 1:1 tablet program.

Given the limited research on how iPads© affect teaching and learning, this study examines the factors that may impact the use of these devices in the classroom. Implementing a 1:1 iPad© program in a secondary school can modify how instruction, student motivation, and how assessments are delivered. This study looks at the factors that may shape a teacher's technology competency such as their prior experience, attitudes and perceptions, professional development, and ways technology is used in the classroom. Using a defined benchmark, the SAMR model, the effectiveness of this technology can be measured to determine the effect this tool has in developing the 21st century classroom. In completing this study, the researcher explored if iPads© in the classroom have an effect on teacher instruction in using technology in the 21st century secondary classroom.

Chronological History of Technology Use in the Classroom

In 1986, the Apple Classrooms of Tomorrow project offered students and teachers two laptop computers: one for home and one for school (Richardson, 2013). In 1989, the first reported 1:1 computer program began in Australia at the Ladies Methodist College. By the late 1990's, over 50,000 Australian students had their own laptops (Russell, 2004). In the United States, student-to-computer ratios have taken over a quarter century to close the access gap, from

a ratio of 125:1 in 1983 to 3:1 in 2008 (Gray, 2010). In the 21st century, mobile carts and

personal laptops have become prevalent in classrooms across the United States. In 2010, Apple

introduced the iPad©, a personal, mobile tablet device that combined the computing power of a

laptop and the portability of a smartphone. The iPad© is able to download applications (apps)

that provide content-specific or productivity-specific information for the user. In 2010, there

were 3,000 native apps available for the iPad©. Today, there are over 1 million (Statista, 2010).

There have been 155 million iPads© sold since their debut in April 2010, and 10 million of those

were being used in schools (Leonard, 2013). Tablets, specifically iPads©, have consumed 43%

of the K-12 education market (Winkler, 2014). Very few other initiatives in education have seen

such widespread, exponential growth as tablet technologies in the classroom.

Review of Literature of the Effectiveness of iPads©

Given that the iPad© did not exist six years ago, the evidence regarding the educational

benefits of tablet technology is limited to a few studies and constrained by the length of time that

the devices have been used. Academic research that centers specifically on 1:1 iPad©

implementation narrows the field even more, although a quick internet search can detail a

plethora of early adopters who have written opinion articles and blogs about their experiences,

which have not been peer-reviewed.

The Department of Education in the United Kingdom detailed a case study on the Essa

Academy in the United Kingdom in their annual Academies Report (DOE, 2011) where over 70

percent of the student body were failing classes, and the school was at risk of being closed. With

over 900 students speaking 40 different languages, many were struggling to overcome cultural

and language barriers. They adopted a 1:1 iPad© program, and through the use of interactive

software, technology-based language translators and educational apps, students had a renewed

enthusiasm for learning because of the dynamic learning environment. Within two years of the pilot iPad© program, pass rates jumped from 28 percent to 100 percent and decreased operating expenses.

Mehuish and Fallon (2010) conducted their research in New Zealand schools that had a 1:1 iPad© program and coined the term "m-learning," which encompasses a wider context of an emergent mobile learning theory and the social and economic drivers that fuel technology development in the learning environment. Instead of looking at specific outcomes of iPad© use, they looked at the ecology of learning that developed from providing the technology in the classroom. They found the students' ownership in their learning was enhanced by the iPad© by allowing the user to personalize their device that supported their own knowledge and conceptual frameworks. Their research offered five affordances for iPads© in education. They stated that portability, ubiquitous access, and situated 'just-in-time' learning opportunities, personalized learning experiences and collaboration opportunities supported learning in a new way that had not been achieved before the invention of the iPad©. The research on this theory recognized the limitations of a singular device, such as the iPad©, and focused on the effectiveness and innovative practices that have been driven by this resource.

In another study conducted in 2010-2011, Houghton Mifflin Harcourt conducted a yearlong pilot program in a middle school in Riverside, California, to study the effect their new *HMH Fuse Algebra* iPad© application had on student test scores in Algebra. They randomly assigned students, provided them with iPads©, and gave them 24/7 access to the *HMH* app. Two classes used the technology, while other Algebra I classes, taught by the same teachers, used the textbook version of the same program. The study found that students were more motivated, attentive in class, and more engaged in the content as compared to the students using

conventional textbooks. It also found that parents were more engaged with their child's learning because they could watch videos or search for solutions to help their child if they themselves did not understand the math. Another benefit was that the app enabled a "flipped classroom" model in which students learned and worked independently at home and then came to class ready to do problems and practice what they had learned (Bergmann and Sams, 2011). Most importantly, test scores showed a higher algebra proficiency, in which 78% of *HMH Fuse* users scored Proficient or Advanced on the spring 2011 California Standards Tests, compared with only 59% of their textbook-using peers (HMH, n.d.).

Oklahoma State University used the iPad© in five sections of two courses across two colleges during the fall semester of 2010.   Two professors in different disciplines used the iPad© in diverse ways but looked at specific measurable outcomes that focused on expense impact, device implementation, the viability of e-text, and overall enhancement of the students' academic experience. Through their research, they observed an increase in the pace of the course, a decrease in student expenses that purchased traditional textbooks, decreased printing costs by using "cloud" technology, and the variety of course-specific apps that ultimately enhanced the learning environment. Faculty and students were mixed on using the iPad© as an e-reader. Although students appreciated the textbooks as part of the iPad©, e-book reading actually decreased over the semester. Overall, 75% of the students agreed or strongly agreed that the iPad© enhanced the learning experience of the course. OSU President Burns Hargis stated, "We put this powerful and creative tool in the hands of faculty and students and the end result reached beyond enhancing the academic experience of our students. The report outlines a possible decrease to student and administrative expenses, increased productivity, and how the iPad crosses between academic and personal barriers" (May, 2010).

A study conducted in the Auburn, Maine, school district assigned iPads© to half of its 16 kindergarten classes for nine weeks. The randomized control involved 129 students using an iPad© while 137 students were taught without an iPad©. The 266 students had a pre- and post-literacy test. Students that used the iPads© outperformed the non-iPad© students in every literacy measure on which they were tested, and there was a higher level of student motivation and engagement with the students that were provided iPads© (Bebell, 2015).

The University of California Irvine's medical school issued iPads© to the 104 students of the incoming class of 2014. These students formed an iMedEd Innovators group that created 19 new health apps for Apple devices that included portable ultrasound technology. These students scored an average of 23% higher on national exams than previous classes, although their incoming GPA and MCAT scores were comparable.

Federal Initiatives to Increase Classroom Technology

Since 2008, $5 billion in private and public education has been spent on tablets in education (Etherington, 2013). With such an outpouring of money on one educational tool, there is a need to substantiate its place in the classroom. On February 17, 2009, President Obama signed into law the American Recovery and Reinvestment Act of 2009 (ARRA), historic legislation to stimulate the economy, support job creation, and invest in the critical area of education. The ARRA laid the foundation for education reform by supporting investments in innovative strategies that are most likely to lead to improved results for students, long-term gains in schools and school system capacity, and increased productivity and effectiveness. President Obama stated, "It's time to stop just talking about education reform and start actually doing it. It's time to make education America's national mission" (RttT, 2009). The United States Department of Education used "Race to the Top" (RttT) initiatives to support the use of

technology to improve student achievement. Any state could apply if the Department approved their State Fiscal Stabilization Fund program, and the state must not have had any legal, statutory or regulatory barriers at the state level linking data on student achievement or student growth to teachers and principals for the purpose of evaluation. There were six priorities that that the U.S. Department of Education concentrated on in awarding these grants. Two of these priorities explicitly concentrated on technology. These two priorities included technology-based tools to increase instructional improvement systems and an emphasis on Science, Technology, Engineering, and Mathematics (STEM) (RttT, 2009).

From over 300 applications, 16 district winners garnered over four million dollars in federal grant money that put a premium on personalized learning. A review of the winning applications showed a similarity between the award winners that included mobile devices, individualized learning plans, personalized learning coaches for teachers, and data dashboards that collected student learning information in one place (EDWeek, 2013).

Some examples of the grantees include the Warren Township Schools in Indiana who were the first in their state to receive significant funds ($28.5 million dollars) from the $400 million "Race to the Top" dollars to personalize learning through technology that aligned with college and career-ready standards (McNeil, 2013). The township's vision was two-fold. Their first initiative was to directly link the new instructional technologies and high-tech learning environments to motivate learners. Their second need was to create alternative pathways to graduation using Virtual Learning opportunities.

In 2012, Charleston County, South Carolina, schools were granted a four-year $19.4 million dollar RttT federal grant to purchase iPads© for all students at 19 high-need schools. Moving away from the lecture and worksheet instructional model, the goals of the program

centered on personalized learning that created critical thinkers through rigorous and relevant instruction. The Charleston district also created a Department of Personalized Learning to help educators use technology that facilitated a deeper learning for students through individualized lessons. The district hired an independent consultant to conduct a two-year evaluation of the Charleston district's iPad© implementation and found no significant gains in achievement but did find higher student motivation and engagement (Metis, 2012).

Hwang (2008) studied large-scale district implementations of tablets and notes that there have been few success stories. He stated that overly aggressive timelines, insufficient project management, inadequate infrastructure, and lack of consistency in supporting curriculum standards all contributed to a low "return on investment" on 1:1 tablet programs. Nationally, some large school systems and some districts have retracted thousands of devices soon after many dollars and resources had been expended to acquire tablet technology (EDWeek, 2015). Los Angeles Unified School District, the nation's second largest school district, has spent over $1 billion to purchase iPads© and estimated that it would cost $60 million dollars annually to renew software licenses. Security breaches, improper student use, and lack of infrastructure have caused the system to recall iPads© in 47 schools (Herold, 2013a).

In Texas in 2012, an investment in 81,000 iPads© was combined with wireless network upgrades for the state's iAchieve program at a cost of $18 million dollars. District administrators in the Fort Bend ISD canceled the 1:1 program after months of problems that included inconsistent wireless coverage, new lessons failing to support district standards, lack of implementation, and a lack of leadership (Herold, 2013b).

The most successful applications of 1:1 iPad© programs have occurred in smaller systems (Edwards, 2014) or in independent, private schools with smaller populations (Heinrich,

2011). Smaller systems have a lower cost commitment, and the scope of problems tends to be more manageable than large-scale rollouts.

Benefits and Challenges

      Benefits.

Evaluations of the initial data from the RttT grant implementations illuminated a variety of pros and cons of using iPads© in education. Electronic textbooks cost an average of 50% less than printed textbooks, but the initial start-up costs with training, infrastructure, hardware, and software purchases can increase the cost by 500% (Graydon, 2011). Electronic textbooks can be updated instantly with new editions and offer interaction with 3D modeling, highlighting, annotating, and searching for key information (Graydon, 2011). An individual iPad© can hold hundreds of textbooks, quizzes, and homework, reducing the need for physical storage and lessening the 14,000 backpack injuries that are treated yearly (Skaggs, 2006). Finally, iPads© significantly reduce the amount of paper that teachers use for handouts and publishing companies use in producing textbooks, although there are still environmental and energy costs in manufacturing and maintaining an electronic device.

Another benefit may be the intuitive aspect of using the technology itself, which makes it more accessible and reduces the need for skilled teacher input. For example, as part of the Global Literacy Project, two isolated rural villages in Ethiopia were given closed, taped shut boxes containing tablets pre-loaded with educational apps but with no instructions. Within five days, elementary school-age students without prior education were using 47 apps per child, per day. Within two weeks, they were singing ABC songs, and within five months, they had successfully hacked the tablet's operating system and customized the desktop settings (Smithsonian, 2014).

Challenges.

The work of Mehuish and Falloon (2010) demonstrated the advantages of the iPad©
improving pedagogy and student learning outcomes, although other studies in which states and
districts that have cancelled their iPad© initiatives, highlight the disadvantages of cost, student
attention span, access limitations, and a lack of digital citizenship education in implementing the
iPad© in those schools.

Among the negative aspects of the use of tablets and other technologies, Shan (2013)
notes that physical problems, such as Computer Vision Syndrome, which causes eyestrain,
headaches, and blurred vision, an increase in carpal tunnel syndrome, "text neck," and shoulder
pains are side effects of overuse of mobile devices. Also, print textbooks do not have the risk of
crashing, freezing, or getting hacked. Other concerns have been expressed about equity. The
significant cost of the iPad© can increase the "digital divide" and marginalize poorer school
districts and students that have limited Internet access at home. As an example, Daytona State
College in Florida conducted an electronic textbook focus group of students to determine their
preference in reading electronic media or print media. The most common reason given for
withdrawing from the focus group was their lack of technical ability to access and reference a
textbook from a digital device (Graydon, 2011).

Table 1 presents an overview of the benefits and challenges of using iPads© in an
educational setting. The following pros and cons are reoccurring themes compiled by teachers
and educational consultants in the United Kingdom in implementing the iPad© in the classroom
(Cain, 2014).

Table 1

Pros and Cons of iPad© use in the Classroom

Pro	Con
Portability/lightweight	Expensive
Consolidates all information in one place	Prone to break
Versatility – apps/text/email	Heavy dependence on Wi-Fi
Connectedness/vast library of resources	Equity in connectedness
Organization	Failure/malfunction of device
Environmental – reducing print material	Can be more difficult to use than hard copy of textbook
Positive digital footprint- college and career	Negative digital footprint/cyber bullying/online safety and security
Personalized learning	Distractibility
Preparing learners for 21st century	Difficult to manage in a large school system
Ease of communication	Ongoing professional development
Offers diverse teaching methods	Some teachers and students prefer methods that do not include technology
User-friendly	Increased tech knowledge for teacher and student
Long battery life	Dependent on recharging

Revised Technology Standards

In June 2016, the International Society of Technology Educators revised educational technology standards for students that were originally released in 1998 and last amended in 2008 (Herold, 2016). In 2008, the standards did not focus on empowering students because the tools and productivity piece of technology were new to education. Internet access, mobile carts, and tablet technology were just becoming available in the classroom. With ready access to technology, 1:1 programs, and new designs for teaching and learning, the new standards embodied a significant shift in the way technology is used in the classroom. The new revisions concentrated on leading with instruction that focused on skills and qualities that learners needed to master instead of a particular tool or application. Another important evolution to the standards

was the emphasis on digital citizenship, or a student's "digital footprint." This was due to the use of personal data, where security and privacy become more difficult to maintain through automated tracking as students navigate online. Students have a moral and ethical responsibility to take a proactive approach in using technology in an appropriate way. This revision encompassed over a year of engaging stakeholders that included over 2700 educational professionals from 52 countries. A new voice to the 2016 standards incorporated 300 students from around the globe.

The following standards were recently released at the 2016 ISTE conference in Denver, Colorado:

Figure 1. Revised ISTE Student Standards 2016

- Empowered learners who use technology to shape and choose their own learning paths.

- Digital citizens who "recognize the rights, responsibilities and opportunities of living, learning, and working in an interconnected digital world."

- Knowledge constructors who draw on a mix of digital tools and resources to actively explore real-world issues.

- Innovative designers with the ability to "identify and solve problems by creating new, useful, or imaginative solutions.

- Computational thinkers who can use technology to develop and test solutions.

- Creative communicators who can express themselves "for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals."

- Global collaborators who can work with others using digital tools.

Teacher standards are currently being revised from the 2008 guidelines. The changing of how students use technology also has impacted the way that teachers incorporate the standards into their pedagogy.

ISTE standards for teachers are currently being revised from the 2008 model:

Figure 2. ISTE Standards for Teachers 2008

Digital Citizenship and Laws

      With the implementation of these devices, there is also a moral obligation as educational

institutions to help students use the device in creating a positive digital footprint. Digital

citizenship has become a topic not only in schools but also federal and state laws.

      Schools have a significant moral responsibility when beginning a 1:1 program. The

majority of teenagers use a mobile device to access social media, engage in gaming, listen to

music, and search the Internet. Using iPads© as an educational tool shifts the focus from

personal use to taking notes, research, creating presentations, reading e-textbooks, and increasing

work flow and efficiency in the classroom. Schools must teach students how to use the iPad© as

an educational tool along with the weighty task of educating students to create a positive digital

footprint when posts, blogs, pictures, and videos can be permanent in today's global society.

Schools must have systems in place to protect students from harmful content, regulate, and filter

student access while on campus. Federal, as well as state agencies, has created laws specific to

acceptable use policies that are specific to digital media.

Federal Law

In implementing new technology resources in the classroom, federal and state laws were

moved to protect minors from inherent dangers that are associated with accessing the Internet.

The Children's Internet Protection Act (CIPA) enacted by Congress in 2000 (PL 106-

554) is the key federal law affecting the instructional use of digital media.

> CIPA requires any school district that receives E-rate funding to filter or block visual
> depictions that are obscene, contain child pornography, or material harmful to minors.
> The law also requires districts to have in place an Internet safety policy. CIPA became
> law in 2000 before the emergence of social networking and the widespread use of mobile
> devices. Thus, it does not stipulate any specific requirements for school districts using
> social networking or other Web 2.0 applications. CIPA provides considerable latitude in
> the formation of school district policies. The Federal Communications Commission
> (FCC) has provided a short guide to CIPA that lists five elements that must be
> incorporated into the Internet safety policy of the school district. School districts
> generally refer to their Internet safety policy as their Acceptable Use Policy (AUP) (FCC,
> 2000, pg. 1).

The five elements of CIPA are (FCC, 2000, pg.1):

- Access by minors to inappropriate matter on the internet
- The safety and security of minors when using electronic mail, chat rooms, and
  other forms of direct electronic communications
- Unauthorized access, including "hacking" and other unlawful activities by minors
  online
- Unauthorized disclosure, use, and dissemination of personal information
  regarding minors
- Measures restricting minors' access to materials harmful to them

Federal law and FCC regulations do not clarify whether school districts must provide filters on school-purchased devices that students are permitted to bring home. In 2008, the Broadband Data Services Act (PL 110-385) was signed into law. Title II of the Act is named "Protecting Children in the 21st Century." Section 254 of Title II requires schools to educate children on the safe use of the Internet. In 2011, the FCC issued further language to the Act that tied it to the existing rules for implantation of CIPA. As a consequence, schools must certify that they are educating students on the safe use of the Internet, although there are no specifications on how schools must accomplish this.

Maryland State Law

Maryland H.B. 199, 2008, Code 7-424, 7-424.1 establishes laws that relate to bullying, harassment and intimidation in schools and allows schools to establish policies for punishment. As of April 2014, this law did not specifically address cyber bullying. The Maryland legislature led by Delegate Cardin in 2013 specifically proposed criminal sanctions for electronic harassment. This was referred to as Grace's Law. Grace Acoma was a high school student who committed suicide in 2012 on Easter after being cyber bullied by a neighbor. Grace's Law passed the legislature in April 2014 and prohibits the misuse of interactive computer services which "prohibits a person from using an interactive computer service to maliciously engage in a course of conduct that inflicts serious emotional distress on a minor or places a minor in reasonable fear of death or serious bodily injury with the intent to kill, injure, harass or cause serious emotional distress to the minor or to place the minor in reasonable fear of death or serious bodily injury. Violators are guilty of a misdemeanor, punishable by imprisonment for up to one year and/or a $500 maximum fine." (Misuse of Interactive Computer Service, MD

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HB0396, 2014). Currently all states (except Montana) have bullying laws while only 20 states expand the law to include cyber bullying.

Since 2000, the United States Department of Education and state laws have brought new levels of internet censorship to schools and libraries across the country. This censorship also brings about questions to the First Amendment rights to the Freedom of Speech. In Multnomah County Public Library v. United States (Dec. 2000), the American Civil Liberties Union argued unsuccessfully that the federal laws are unconstitutional. As new technology and social media continue to evolve, states and federal entities will continue to review their current laws to protect citizens, especially minors, as they relate to internet safety. Developing strong Acceptable Use Policies (AUP's), which are constantly reviewed, and student education on these policies are fundamental factors in having a successful 1:1 program in schools. Schools and faculty have a responsibility to take a proactive, rather then reactive, approach to educating students in appropriate use of mobile devices. Together, our society must take the initiative to ensure the proper use of internet accessibility to the 10 million students that are using iPads© in the educational setting.

Acceptable Use Policies

Despite the limited guidance, many schools and systems are taking a reactive approach in creating policies and practices due to new innovations in "anytime, anywhere" mobile access for students. Public and private schools alike have access to E-rate grants to help curtail the cost of infrastructure, broadband access, and other telecommunication services. One of the stipulations for receiving this funding is for schools to have a published Acceptable Use Policy (AUP). Accessing inappropriate material, violating copyrights, camera and recording capabilities, and privacy laws are challenges that both public and private schools face in allowing mobile access

in schools. Private schools also face additional barriers in forming policies when the device is student-owned because schools have less control on downloaded apps, privacy infringement, and monitoring restrictions. The formation of AUP's for schools is a paramount first step in providing internet access to students.

Investigation

This study investigated the effects that iPads© have on teaching and learning through a teacher perspective in order to determine the impact of an iPad program in schools. The researcher used established models and rubrics for assessing a 21st century learning environment from Ruben Puentedura's SAMR model (Puentedura, 2012). Gathering data using the SAMR model to evaluate assessments and tasks, reviews of case studies, research of current literature, and survey responses were used to measure the effectiveness of iPads© on teachers' technology use in the secondary classroom.

This study will aid in informing other school systems about the effectiveness of iPad© use in the classroom and its relationship to teachers' abilities to use technology. The portability of the device, the ability of personalized learning, the comprehensive productivity of the tool, and the access to information that the iPad© provides are all positive reasons for implementation. These positive factors can be dependent on professional development training, the pedagogy supplementing its use, the methods of implementation, and the technical support provided to those using the device in education. The SAMR model provides a solid framework for determining the levels of implementation as it relates to higher levels of learning.

The collected data for this study was accomplished solely through teacher surveys. Teacher attitudes and abilities toward using technology as well as their perceptions on student motivation form the quantitative research for this study. The data gathered in this study will

inform our knowledge of how secondary classroom teaching is being redefined in the 21st

century.

The results of this study may inform school leaders about the current frequency and types

of iPad© usage at this secondary school, teachers' perceptions about their student's responses to

iPad© use in classroom instruction, and teachers' perceptions of their professional development

experiences regarding iPad© use. Through this research, school leaders can also examine

teacher attitudes in implementing the technology in the classroom. In looking at ways that

teachers have positive results in using the iPad©, this can further assist school leaders in creating

professional development and implementation procedures that may avoid negative feedback

from the teachers that are using the iPads©. Finally, because iPad© use is a requirement of the

teaching practice in this school, and this school has made a significant financial investment in the

use of iPads©, data gathered in this study may help administrators determine the feasibility of

the program as well as identifying best practices for the program.

SAMR Model

This study concentrated on the SAMR model because of its tiered approach to technology

integration and a simplistic approach to categorize levels of iPad© usage in the classroom.

SAMR MODEL
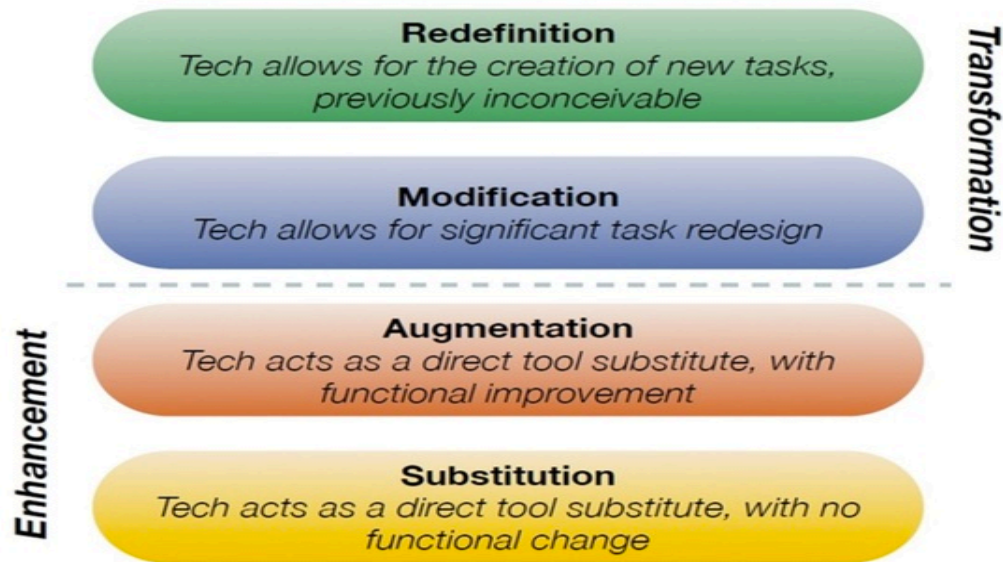
FIGURE 3. SAMR MODEL (Puentedura, 2006)

The SAMR model (Puendtedura, 2006) details different tiers of technology integration. The acronym stands for Substitution, Augmentation, Modification, and Redefinition: the four levels that define the SAMR model. The SAMR model uses a tiered system for implementing technology in which all four levels of integration can be used in one lesson, or in which a single tier can be utilized to supplement a lesson using technology. The SAMR model examines the idea that technology can change the quality and efficiency of tasks but can also change the conditions for communication, interaction, and learning. Apple, the company which manufactures the iPad©, also endorses the use of the SAMR model (Apple, 2013).

Tiers of SAMR Model

 Substitution and Examples.

 Substitution occurs when technology is a direct substitute for what is already being done with no functional change. This is the lowest level of technology integration in using the iPad© in the classroom. Using the iPad© and a stylus to take notes instead of using paper and pencil is

an example of substitution. Accessing and reading text online instead of a hard copy of the text also is a direct substitution of the technology that replaces a book. Further examples include digital highlighting of an e-text, taking a quiz on a computer, searching the internet instead of an encyclopedia, and creating Venn diagrams using technology.

Augmentation and Examples.

Augmentation uses technology as a direct substitute, but there is functional improvement over what was done without the technology. Using a note-taking app that allows you to categorize, tag, insert photos and electronically share notes would be augmenting the note-taking process. Editing a paper in real time using digital tools increases the functionality of the task but not necessarily the overall product. Polling a class about a political figure allows the class to visualize others' views instantaneously and can lead to informed discussions more efficiently than a Scranton-type poll. Using a shared Google doc allows an exchange of information that can facilitate conversations as opposed to using a traditional pen pal. Augmentation is the second level of integrating technology in the classroom.

Modification and Examples.

Modification allows the teacher or student to significantly redesign a task or assignment with the addition of technology. Combining audio, video and text notes in an iMovie presentation would significantly modify what a student could accomplish with standard classroom tools. Being able to access video lectures and materials to participate in a class in real time when a student is sick at home is an example of modification that is being used in many educational settings. Technology enables students to create digital handbooks, a task that would be impossible without the use of technology. For example, using video, audio, and screenshots to study marine mammals instead of a printed field guide significantly modifies the task. In a

22

case study by Cornelius (2011), students used technology to modify and redesign a flood disaster simulation in an applied geomorphology class. Based on real-life scenarios, students could modify their response and alert systems to the flood. Modification allows for significant task redesign that would be impossible with traditional classroom tools.

Redefinition and Examples.

Redefinition allows for teachers to create new tasks that would not be possible without the use of technology. Redefinition occurs when notes are translated into visual mind maps or allowing peer-feedback and collaboration using Google docs with students in the class or other countries. Creating a paperless environment using Google Dropbox and using real time collaboration with students in another country via Skype are just a few ways that technology can redefine the way students learn and receive feedback in the classroom. Sharing conversations with students in other countries allows the learner to be exposed to authentic cultural viewpoints, giving them a cross-cultural view that redefines a student's learning experience. Using an application to animate and create a story redefines the way a learner absorbs the material through different senses. For example, a study by Liu and Tsai (2013) in teaching English to Chinese language learners used GPS to pinpoint a student's location and displayed English descriptions of images around them using the camera on their mobile device. Redefinition is the highest tier of the SAMR model and reinvents a task that was previously inconceivable.

SECTION II: METHODOLOGY

Purpose of the Study

The goals of this study were two-fold: determining the variety of ways that iPads© can be utilized in the classroom and obtaining teachers' perceptions towards the usefulness of this technology in the classroom. The research was conducted through a web-based survey using Qualtrics. The analysis of the data collection using surveys was designed to inform the researcher about effective use of iPads© in instruction and helps incorporate teachers' views of iPad© use in their changing instructional practices.

Research Questions

The research questions for this study are as follows:

1. How frequently do teachers observe the iPad© being used by students in the classroom at each of the SAMR levels: substitution, augmentation, modification, and redefinition?

2. Based on the SAMR model, how do teachers report using iPads© at each of the four levels (substitution, augmentation, modification, redefinition) in tasks in their instructional practice?

3. What specific types of professional development and other supports do teachers perceive as most effective and most needed in improving their classroom teaching practice?

4. What are teachers' attitudes towards the use of the iPads© in their classroom instruction?

This study was designed to inform school leaders about teacher perceptions on the use of technology in the classroom and its impact on the way they teach. The three areas of focus in this

study were the amount and types of professional development teachers receive, teachers'
attitudes towards the use of technology in the classroom, and teachers' perceptions of how
technology affects the ways students respond to their teaching and its use in the classroom.

For the purpose of this study, the use of a specific technology tool – the iPad© – was
examined. This study contributes to the current research by examining the attitudes of teachers
towards this technology and the variety of ways that iPads are currently implemented. The
model used in the study assessed the ways teachers use the iPads© in their classroom instruction
based on the SAMR model. It created a framework for evaluating teaching and learning using a
mobile device, or mLearning. Using the data collected from the surveys, the researcher will
quantified how iPads© are being applied in a secondary school classroom.

Design and Methods

This study used quantitative methods, which concentrate on objective measurements and
the use of statistical analysis of data collected through a survey. Johnson and Onwuegbuzie
(2004) encourage a quantitative approach to gain an objective understanding of the issue.
Quantitative research can also help prove cause and effect by examining one independent
variable, or construct (Creswell, 2002). The independent variable in this research experiment is
the iPad©. The survey collected data on teacher demographics, frequency of iPad© use, teacher
professional development as it relates to the iPad© and teacher perceptions on using technology
in the classroom. Teachers were surveyed about their frequency and types of iPad© use in the
classroom as well as that of their students. This enabled the researcher to document and record
ways that iPads© are used in the classroom as well as provide an overview of teachers'
demographics including educational experience, level of proficiency in technology, and
frequency in using technology. Combining the research approach, a broader scope of iPad© use

in the classroom, as well as teacher attitudes towards technology all helped address the research problem of determining the effectiveness of iPads© in a high school classroom. It aided the researcher in finding common language, perceptions, and data correlations that would be common in a learning environment. Collecting data on the number of ways that iPads© are used in the classroom gave the researcher a one-dimensional source of data. Including teacher attitudes, professional development, and knowledge of the SAMR model enhanced the numerical data by providing reasons for the depth of implementation of the iPad© in the classroom.

Quantitative data was collected through a 22-question survey with an opportunity for the participant to add comments based on the survey questions. Surveys determined demographic information of the teachers, professional development of the teachers as they relate to technology, ways iPads© are prominently used in the classroom, and an assessment of teachers' attitudes and beliefs in using the iPad© as an instructional tool.

Measurement

In order to evaluate the integration of technology in the learning environment, the SAMR framework was used in quantifying how the teacher uses technology. The SAMR model represents how technology is used based on four definitions outlined in the previous section. This model was used in this study to evaluate how teachers are utilizing technology, specifically the iPad© in their classrooms. This model was chosen because it is the language that the researcher's teachers are familiar with and have been trained on since the inception of iPads© in their classrooms.

Limitations

Education is relational and therefore provides an opportunity for bias. As stated by Lunenberg and Irby (2008), a study's limitations are not under the control of the researcher. Teacher attitudes, level of professional development, technology proficiency, student attitudes, and instructional delivery are factors that could contribute to the effective use of iPads© in the classroom. The sample size the researcher used was confined to one institution with a limited number of teachers to survey. This may have created bias by having the same professional development opportunities available to the teachers. Having the same professional development can also help normalize responses in teacher surveys, attitudes, and integration methods. If there was an area that was not emphasized in the professional development, it may also show gaps in executing technology integration in the learning environment. Teacher bias toward new instructional tools before the technology has been introduced can lead to a lack of integration of the technology tools. Providing teachers with access to iPads©, apps, and the internet itself are just parts of effectively integrating technology in the classroom. Jones (2001) stated that one of the most decisive factors for success in technology integration involved the amount of technology training provided to the teachers. Specific training not only in learning new technologies, but also the lack of training using the technology in subject-specific ways to change the way curriculum is delivered was a downfall that was explained in other training models (McKenzie, 2001). Pedagogy can also be a factor in limiting the effective use of technology in the classroom. Teachers that continue to take a teacher-centered approach to delivering the material can impede the complementary relationship between technology use and a constructivist approach. Nanjappa and Grant (2003) found there was a complementary relationship between computer technologies and constructivism and those they benefitted each

other. More recently, Matzen and Edmunds (2007) concluded that teachers who proficiently

used technology in their classroom were viewed as constructivists. Being able to quantify how

the teacher's pedagogy has changed from a teacher-centered approach to a more student-centered

approach could also appear to as a limiting factor in this study. Teachers that used a "stand and

deliver" approach before the use of technology may continue to use technology that supports

their existing methods. Palak and Wall (2009) did not see a significant change in teachers'

pedagogy when they studied schools that were technology-rich.

When teachers responded to the survey questions, they were specifically asked how

iPads© provided a benefit or challenge to the classroom. Since there are other factors, such as

infrastructure, software or other technology tools that work together to integrate the iPad© in the

classroom, teachers may have responded by thinking about technology in more general terms.

This could have skewed the data to certain questions, for example, when teachers were asked

about their confidence level that the iPad© would function properly, they may have responded

by taking a broader perspective on how confident they were in having all the technology perform

properly to complete a task or lesson.

Another limitation in doing this study is that the researcher also serves as the teacher's

principal supervisor and primary evaluator. Surveying teachers that report directly to the

researcher can have an inherent bias when they were asked how effectively they implemented

technology in the classroom. The researcher employed an independent analyst to electronically

distribute the survey as well as collect the data through Qualtrics. This person had no

supervisory or administrative role with the teachers being surveyed, thus creating a climate

where the teachers felt free to respond without the perception that the survey in no way was

connected to their classroom evaluation. The independent surveyor has an earned doctorate in

school administration, is a former high school principal, and has held executive leadership positions within a school system. To also mitigate a portion of this bias, the researcher's surveys were anonymous with no identifying information and coded through Qualtrics software, which allowed for participants to complete the survey without collecting IP addresses, names, or other identifying factors.

School leadership can also be a limiting factor in technology integration. Expectations of the school leader, opportunities for professional development training, availability of IT support, current access to technology tools, and reliability of the tools may singularly or collectively contribute to the level of integration in a school system. School leaders play a major role in how technology is viewed by teachers and the importance of implementing technology in the classroom. The support system for technology comes with major costs, which can limit the effectiveness of the technology. These costs can come in the form of hard and soft costs. Time, infrastructure, and access to professional development along with hardware and software are all budgeting items, whether monetary or non-material costs.

Conceptual Framework

The researcher concentrated on four areas that guided the research questions for this study. This conceptual framework directed the researcher to gather information in order to answer the problem of the effectiveness of iPads© in the classroom. Figure 4 on the next page provides a visual representation of the conceptual framework which shows the factors that this study investigated in order to determine the how iPads© can benefit the classroom instructional practice.
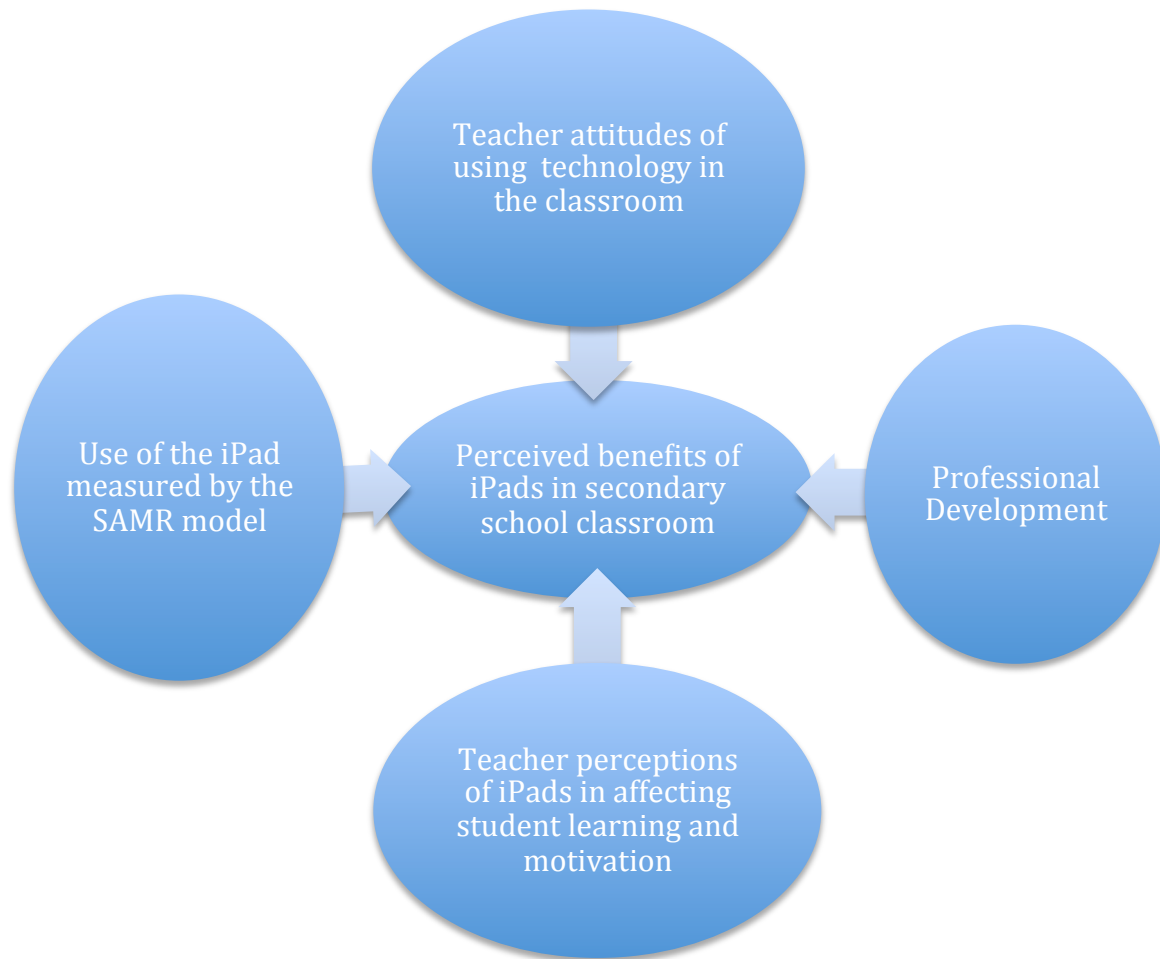
FIGURE 4. Conceptual Framework for Research Questions

Research Setting

This study was conducted in a secondary school, grades 9-12, which has implemented a

1:1 iPad© program since 2012. This school has the following demographics: 46% Caucasian,

16% African American, 5% Asian, 3% Hispanic and 3% Multi-racial. Students that qualify for

free and reduced meals (FARM) total 16% of the population. Approximately 10% of students

receive special education resources and qualify for an Individualized Education Plan (IEP).

Students with Limited English Proficiency (LEP) make up 2% of the population. The school

serves students from 8 different counties, 48 different middle schools, and 2 states. 99% of the

student body matriculates to higher education. The teaching faculty has degrees in a variety of areas, with 75% holding advanced degrees.

Target Population

This research study surveyed full time teachers in a secondary school that have been exposed to a 1:1 iPad© program for 2 or more years. Currently, there are 35 teachers that have 2 or more years of experience using the iPad© in the classroom. These teachers were sent an individual survey link to complete the study. The researcher's goal was to garner a maximum return rate from the respondents. Teachers that had not responded were sent reminder emails by the independent consultant twice during the study duration with a link to the survey.

Survey Pilot Testing

The survey was piloted on four administrators that are familiar with the iPad© program and usage but were not included in the target population. These respondents were asked to take the survey and agreed, knowing their data would be erased and not included in any part of the study's data collection. Each individual received an email with a link to the survey along with the cover letter. The researcher requested feedback on five areas of the survey:

- Readability
- Grammar/Syntax
- Efficiency
- Organization
- Amount of time spent on the survey

All four participants responded to the survey and edits were made based on the pilot test feedback.   From the feedback, the surveyor split two questions that ranked teacher professional development into four questions to make the questions less cumbersome. A question was added to include teachers' observations of students' use of the iPad©. The surveyor also changed the order of the questions to block them into similar categories.

Data Collection

Surveys were administered using the University of Maryland's Qualtrics software. Questions were divided into blocks. Block 1 concentrated on teacher demographics and collected data on the number of years teaching, number of years teaching with the iPad©, gender, highest degree, certifications, subject area, and time spent using technology. Block 2 focused on frequency and ways teachers and students used technology in the classroom. These survey questions employed a Likert-scale that spanned from Everyday, Weekly, Monthly, Less than Monthly and Never. Block 3 looked at the importance of technology professional development. Teachers were asked to rank-order professional development opportunities that they felt were most effective in varying instruction and increasing technology use in the classroom. Block 4 surveyed a teacher's confidence with technology and their comprehension of the SAMR model by using multiple-choice questions. Block 5 collected data on teacher attitudes towards iPads© in the classroom. A Likert-scale of Strongly Disagree to Strongly Agree quantified teacher perceptions and attitudes towards positive and inhibiting effects of using technology in the classroom. Using the outcomes of the survey, data was analyzed using Qualtrics data and analysis tools and Excel that supported correlations between iPad© use and the teachers' effective use of technology in the classroom. Survey outcomes were coded to analyze where teachers are on the SAMR scale and if there was a relationship between the amount of teacher frequency of technology use, amount of professional development, and their perceptions of technology.

The researcher utilized a quantitative study to collect data on the extent of professional development teachers have been exposed to in implementing iPads© in the classroom, the attitudes of teachers in using technology in the classroom, how teachers perceive the effect of

iPads© on student learning, and if iPads© have had an impact on varying instruction in the classroom. To answer these questions, the researcher reviewed nationally administered teacher technology surveys and their outcomes and formulated a survey that is specific to the school being studied. Questions from the national surveys were analyzed for comparison in answering the researcher's four specific questions. Survey questions that parallel the researcher's study were combined to form a new survey instrument that was used with the teachers in the study. Teachers that did not answer specific survey questions were considered missing data and recorded as such in the data table.

Hypothesis

The researcher's hypothesis is that consistent professional development, a positive attitude in implementing technology and a positive perception by teachers on using technology to increase student learning and motivation will place them higher on the SAMR scale, thus having an effect on how technology is integrated into the classroom instruction.

Human Subject Review and Confidentiality

To protect the secondary school, the individuals in the study, and the University of Maryland, the researcher adhered to the guidelines for the University of Maryland Institutional Review Board (IRB). The following procedures were used to ensure that the identities of all respondents remained confidential.

- All participants received a letter describing the study and detailing their confidentiality in participation in the study.
- All participants agreed with an informed consent electronically before beginning the survey.

- To maintain confidentiality, the researcher did not use names or identifying information in the survey results. Survey respondent names were coded into ID numbers and were referred to as an ID number during the analysis.

- The encoded data and all identifying information were removed prior to the researcher analyzing the results.

- Results were reported in aggregate form (by position, gender, advanced, novice, etc.) to protect the identity of the participants.

- After completing the study, all participants received a copy of the completed results of the survey.

- The research retained the data from the surveys electronically on a personal computer, and the researcher has sole access to the information contained on said computer.

- Individual data was not shared with any other individuals in the school.

- All data will be erased after 5 years.

Summary

Through this study, the researcher's goal was to link iPad© frequency of usage in the classroom, demographic data, levels of professional development, and teacher perceptions of technology to the tiers of the SAMR model.   This study can help develop a best practice model in implementation of iPads© in the classroom by reviewing the teachers' traits that consistently reach the two higher tiers of the SAMR model. This will aid principals, academic technology directors, instructional supervisors, and others to develop an informed pathway for teacher technology education.

This chapter justifies the methods that will support the conceptual framework of the teacher use and perceptions of iPads© in a secondary school classroom. In using a quantitative

approach, the researcher was able to explore the relationships between the research questions as they pertain to the teachers' confidence in using the iPad© as an instructional tool.

SECTION III: RESULTS

Introduction

The purpose of this study was to analyze teacher perceptions of the impact of iPad© use in the classroom on their instructional practice. Using a 22-question survey with an opportunity for comments, this study served to answer four essential questions to determine the impact that iPads© had in a private school that has adopted a 1:1 iPad© program since 2012. The 22 questions encompassed four main categories:

1. The frequency of use in a teacher's instructional practice

2. The teacher's perception of their level of technology integration based on the SAMR model

3. The teacher's perception of effective technology professional development

4. The teacher's perception of how students respond to using iPads© in the classroom

A total of 29/35 participants responded with one teacher who opened the survey but did not complete it which resulted in 28/35 full responses, or an 80% response rate to all 22 questions. This study was conducted in June 2017 and teachers were able to complete the survey within a one-week period on a mobile device, tablet, or desktop computer.

Results

In order to answer the four questions, the researcher examined the data to identify themes and correlations between the demographic data in their relation to teacher perceptions of iPads© in the classroom. In many instances, data was cross-tabulated to investigate how demographic characteristics influenced teacher perceptions. Identifying the correlations and themes benefitted the researcher by understanding areas of strength and challenges in the effectiveness of iPads©

in a secondary classroom. It can also aid future researchers and current administrators in best

practices of implementing a 1:1 program in their school.

Demographic Data

Demographic data was collected to help identify trends in technology use based on years

of teaching, level of education, certification, and subject area taught. Male respondents made up

22% and females made up 78% of the total respondents.   None of the responding teachers

possessed a terminal degree, with 10 holding a Bachelor's degree and 18 teachers having earned

a Master's degree. There were an equal number of teachers that held a Maryland State Teacher

certification, with 14 of the 28 receiving this credential. Less than half (46%) of the teachers

responding had a technology course incorporated into their college coursework. Professional

development through Apple offers an Apple Educator certification, which was accessible to the

teachers in the 2016-2017 school year. This program recognizes teachers for their skills on the

iPad© that directly apply to activities that use Apple products and apps for teaching and learning.

Educators that received this certification made up 29% of the teachers responding to the survey.

The demographic data was reviewed to find correlations between the frequency of iPad© use and

the demographic data. Factors such as years of teaching and certifications could affect the

likelihood of a teacher to accept and implement new ideas, such as integrating the iPad© in the

classroom.

Frequency of iPad© Use in the Classroom

The researcher reviewed how frequently iPads© were used in the classroom. Categories

ranged from daily, weekly, monthly, less than monthly, and never. None of the 28 teachers

surveyed used the iPad© less than monthly or never. Daily use of the iPad occurred in 61% of

the respondents, and 32% used the iPad© at least weekly. Only 2 respondents used the iPad© on

a monthly basis. This showed the researcher that the iPad© is an integral educational resource in which 93% of the 28 teachers who responded used the iPad© either daily or weekly.

Years of Teaching

Teachers were asked to indicate the total number of years they had been teaching. The highest number of respondents (36%) had between 5 and 10 years of teaching experience followed by 25% of respondents having 20 plus years of teaching experience. Teachers who had taught between 10 and 15 years accounted for 18% of the teachers who completed the survey. Teachers with 1-5 years and 15-20 years each had an 11% response rate. Figure 5 below shows the number of teachers and their years teaching.
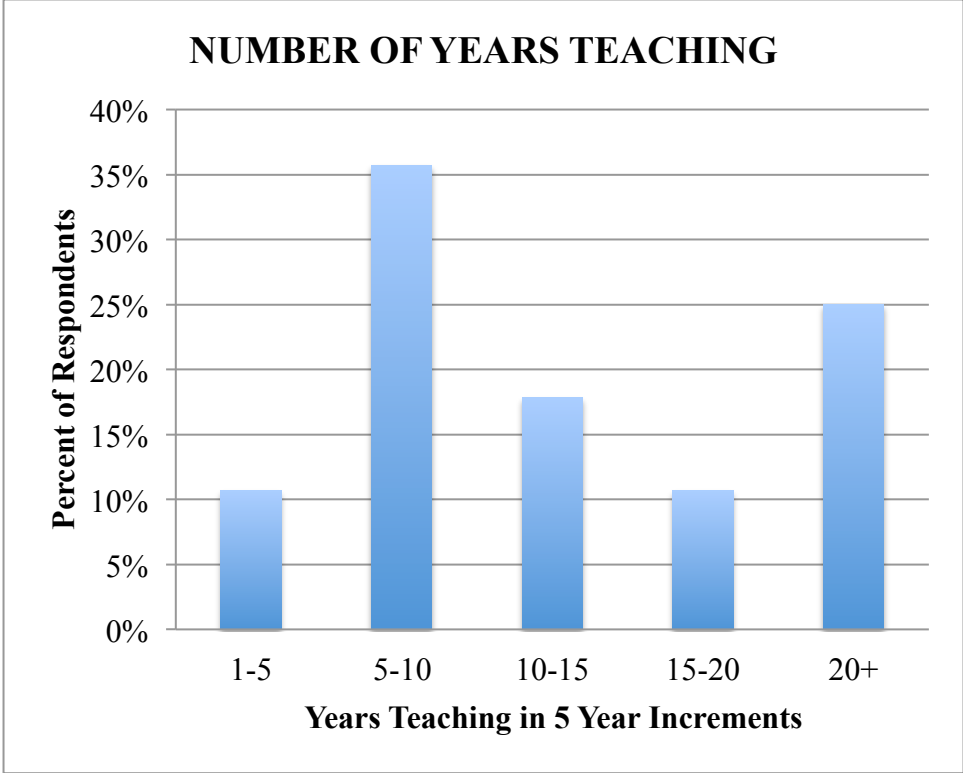

Figure 5. Number of total years teaching

Years Teaching with the iPad©

    The majority of teachers surveyed (86%) had been teaching with the iPad© for 4 or more years. Teachers that had less then 2 years of teaching with an iPad© were not included in the survey, so there were no respondents with less than 2 years experience. Figure 6 below shows the number of years of experience teachers had teaching with the iPad©.
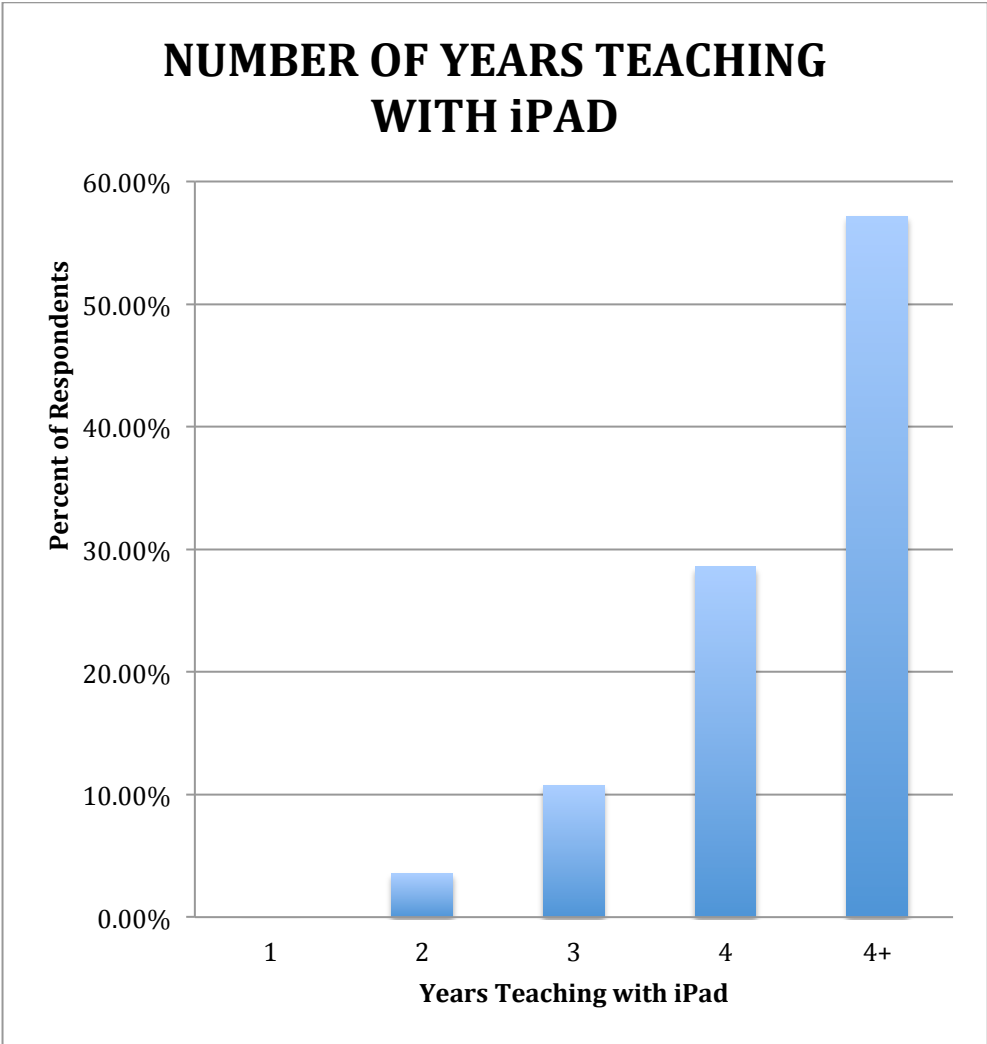

Figure 6. Number of years teaching with the iPad©

In examining the cross-tabulated data of total years teaching and years teaching with the iPad©, the survey showed that 80% of the teachers that have taught 10-15 years used the iPad© daily, followed by 71% of the teachers who have taught for 20 plus years. Teachers that had 5-10 years experience, who were also the highest number of survey responders, included only 40% who used the iPad© on a daily basis. In analyzing the data, teachers with the most teaching experience were more likely to integrate the technology on a daily basis as opposed to teachers with less total teaching experience. This could indicate that more experienced teachers may have more mastery in their content area and may be more confident about trying new ways for students to learn the material. When considering the number of years teaching with the iPad©, 75% of the teachers who had taught 4 plus years with the iPad© used the device on a daily basis. Teachers with 3 or 4 years teaching with the iPad© were more apt to incorporate the technology weekly instead of daily, averaging 65% who reported using it weekly and 35% using it daily. This may be explained by the fact that the teachers with 4 plus years were the original adopters of the technology as it was introduced to the school. In the adoption of many new initiatives in the school system, there can be a stronger emphasis on professional development leading up to the introduction and implementation of the initiative. These teachers see themselves as innovators and embrace the new technology as everyone is perceptually on the ground floor learning together (McKeown, 2006). Teachers that were part of the initial implementation received iPads© a full year before the implementation and then had a pilot year with the incoming freshman class. During that time, most of the professional development concentrated on integrating the new technology. Although there has been ongoing professional development throughout the years in this school as it relates to the iPad©, teachers that came to the school

after the initial implementation may not have received the same level or intensity of the professional learning that was incorporated into the years leading up to the 1:1 program.

In considering the data on frequency of iPad© use and years of teaching, teachers with more years of experience used the device more on a daily basis then those with less years of experience. Also, teachers that had taught with the iPad© since its inception at the school were more likely to use the iPad© on a daily basis. Table 2 on the next page shows the breakout of the years of experience as it pertains to frequency of iPad© use.