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The Integration of Technology Into Instruction by Elementary Teachers In Brevard County, Florida: An Investigative Study

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THE INTEGRATION OF TECHNOLOGY INTO INSTRUCTION BY ELEMENTARY TEACHERS IN BREVARD COUNTY, FLORIDA: AN INVESTIGATIVE STUDY

by

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ABSTRACT

Technology has become a part of the very fabric of society today. Technology's infiltration into business, industries, the medical field, and entertainment has accounted for huge advances. However, in the field of education the impact technology has had is regarded as less impressive. Muller, Wood, Wiloughby, Ross, and Specht (2008) stated "…it is critical to understand teachers' perspectives regarding computer integration in the classrooms" (p.1523). With the Improving America's Schools Act of 1994 (Public Law 103-382) the integration of technology in schools should be strongly evident. Currently, twenty years after the commitment to develop technologically literate students, technology integration should be well defined, seamless in its usefulness within the learning environment, a part of the very fabric of the educational setting, and consist of a proven track record verifying the positive results for utilization in student learning and achievements. However, a review of the relevant literature revealed the goal has not been achieved and the same issues related to the integration of technology into education are still being discussed, researched, and questioned today as they were in its infancy (Anthony, 2011; Bauer & Kenton, 2005; Roschelle, Pea, Hoadley, Gordin, & Means, 2000). Allowing teachers to voice what integration meant to them in both practice and definition and the barriers encountered, could shed light on the underutilization of use discovered in literature. New insights provided from teachers could also be utilized by administration and policymakers towards the development of new policies and mandates. Taking a qualitative, investigative approach, two individual and two focus group (n=6, n=8) interviews from four elementary schools in Brevard County were conducted which focused on understanding the practices and experiences of teachers. Results found time, support structures provided by administration, and specific professional development and trainings were challenges that hampered successful implementation.

The current study is dedicated to my "favorite" Aunt Jenette who has been my encourager throughout my process, never failing to remind me that my struggles and challenges will pay off in the end. My Mom (and Dad) who have been there beside me every step of the way, expressing their pride in my accomplishments. And Jesus Christ in who I find my strength, who is my constant companion, friend, and director of my steps on my journey of life. May I always acknowledge their contributions and honor them in all that I do.

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CHAPTER ONE: INTRODUCTION

The Improving America's Schools Act of 1994 (Public Law 103-382) set in motion a long range technology plan. The goals set forth were enhanced by President Clinton's 1996 Technology Literacy Challenge. The main commitment emphasized the nation's students would be technologically literate by the early 21st century. The established objectives were: all teachers would be provided with needed support to enable students to become computer literate; computers would be available to every student and connected to the "superhighway;" and teachers would be provided with effective software and on-line learning resources that would be an integral part of every school's curriculum (Dept. of Education, 1996).

The expectation would be twenty years after the commitment to develop technologically literate students, the integration of technology into instruction in the schools would be strongly evident. Given the strong presence and reliance on technology, the integration of technology into education should be well defined, seamless in its usefulness within the learning environment, a part of the very fabric of the educational setting, and consist of a proven track record verifying the positive results for utilization in student learning and achievements. However, a review of the relevant literature revealed the goal has not been achieved and the same issues related to the integration of technology into education are still being discussed, researched, and questioned today as they were in its infancy (Anthony, 2011; Bauer & Kenton, 2005; Roschelle, Pea, Hoadley, Gordin, & Means, 2000). Could it be we are not asking the right questions? Or better yet, not invited teachers to join in the conversation in a way that would give rise to intended outcomes.

Problem Statement

A review of relevant and related literature revealed the majority of studies had been conducted using a survey approach as the main method of gathering data. Throughout my review of the literature the following questions arose:

How would teachers, if provided with an opportunity to speak freely, define the role of technology integration? Also what would they identify as the barriers and challenges they face in successfully integrating technology into instruction. General surveys by teachers do not provide an adequate, in-depth picture as to why technology has not been successfully integrated into instruction (Bauer & Kenton, 2005; Judson, 2006). Therefore, discovering the teacher's descriptions of the "integration of technology" into instruction has the potential to aid in understanding if teachers' characterization aligns with what has been reported in the literature and with what administrators and policy makers believe. The current study was designed to provide a platform for teachers to voice their beliefs and to clarify their viewpoints as regards the effectively integrating technology into instruction.

Purpose

Qualitative studies have the potential to provide detailed and in-depth information concerning a person's personal perspectives and experiences (Fraenkel, Wallen, & Hyun, 2012). The purpose of the current study was to fill a gap within the literature by providing a platform from where teachers could join the conversation on technology integration. Muller, et al. (2008) stated, "…it is critical to understand teachers' perspectives regarding computer integration in the classrooms" (p.1523). Allowing teachers to voice what integration means to them in both practice and definition and define the barriers they encounter towards successful technology

integration for student learning could shed light on the underutilization of use revealed in literature. New insights could also be provided to administration and policymakers as policies and mandates are developed. With more usable information it is possible that the programs and support needed for successful technology integration would better provide a platform for the preparation of future students.

Taking a qualitative investigative approach, two individual and two focus group interviews from four elementary schools in Brevard County were conducted which concentrated on understanding the practices and experiences of teachers with technology used for instructional purposes. Qualitative research allows us to "…empower individuals to share their stories" and …"hear their voices" (Creswell, 2013, p. 48).

Research Question

Through an investigative, qualitative approach the present study was guided by the following questions:

1. How would elementary teachers from selected schools in Brevard County, FL define what the integration of technology into instruction means?

2. What are the distinctive barriers which prohibit them from integrating technology successfully for instruction in student learning?

Relevance of the Study

The findings from the current study may provide direction for future use of technology and appropriately address the challenges technology will continue to bring to the classroom. Findings could also further define barriers to the implementation of technology in the education setting and offer potential strategies for overcoming them.

Limitations

Interviews were planned for late January-February 2015, however because of time restraints resulting from clearance for approvals from individual schools, the interviews and focus groups did not take place until March-April 2015. Time restraints, end of year testing, and end of year preparations, therefore had an impact on the number of teachers who had the availability and willingness to participate, making for a smaller sample size. These factors also played a factor in the inability to make classroom observations for verification of equipment and conduct observational studies of classroom routines and teacher and student uses of technology. The possibility of what could have been observed, as well as the lack of information from lesson plans for verification, had a negative impact on the study.

Delimitations

Upper level grades were excluded from the current study, as well as from the literature review, because of the dynamics and difference in the way technology is utilized. Additionally, individual and focus group interviews were chosen for data collection, instead of surveys, based on previous research which indicated only through testimonies were relevant uses of technology integration discovered (Palak & Walls, 2009). The use of multiple methods, sources of data, and literature to confirm findings (triangulation) was used to increase validity. Generalizability was not a factor in the current study. A small non-random, purposeful sample was selected to understand the particular in-depth answers to the research question formed. It was not intended to make discoveries for the multitude. However, the similarities of findings through "sufficient descriptive" data could make transfer possible if situations were similar, but not identical (Merriam, 2009).

Assumptions

Florida teachers are mandated to utilize technology for instruction, therefore it would be inaccurate to assume all teachers are not applying technology in some way. With this assumption in mind participants were chosen not on the basis of whether or not they used technology in their instruction, but because they were teachers. I also expected they would have distinctive viewpoints and important insights to contribute to the study.

Overview of the Study

The current study will present, in Chapter 2 a thorough literature review consisting of the history in order to form a basis for the current study; technology integration as defined through literature; utilization for instruction; and barriers that play a role in ineffective use. Chapter 3 will provide the research methods consisting of the purpose and design, setting, participants, procedures, data collection, and analysis. Chapter 4 will reveal the results by examining the definition of technology integration as defined by teachers, barriers discovered, and potential strategies revealed for effective use. Chapter 5 will outline findings for implementation revealed through a comparison of literature to the current study findings and recommendations and suggestions for future research.

CHAPTER TWO: LITERATURE REVIEW

Introduction

The central assertion of the review was to explore the literature concerning; a) the history of technology integration in order to form a basis for the current study; b) technology integration as defined through literature; c) utilization for instruction; and d) barriers technology has upon teacher implementation in the educational setting.

History of Integration

Goodard (2002) believed one must first have an understanding of how technologies entered the classroom. Approaching the literature review from a historical perspective could provide insights into the policies mandating use and utilization of technology in the current educational system. From the 1980's onward, technology had become the latest tool for reorganization and transformation of a failing educational system. Political opponents, corporations, vendors, parents and policymakers had tied technologies to the belief it could reform the educational system. Some, in this effort, sought profitability, others social justice, and still others the view historical problems could finally be solved. They advocated for technology integration through school boards and superintendents. The goals set forth were one, to make schools, like businesses, more efficient and productive; two, to transform the learning environment where students engaged in real life scenarios; and three to transform classrooms into student-centered environments that required teachers to take the role of facilitators of learning in order to prepare the next generation to thrive in the 21st century (Cuban, 2001).

The Improving America's Schools Act of 1994 (Public Law 103-382), set in motion a long range technology plan. The goals set forth resulted from President Clinton's 1996

Technology Literacy Challenge. The main goal emphasized the nation's students would be technologically literate by the early 21st century. The established goals were: all teachers would be provided with needed support to enable students to become computer literate; computers would be available to every student and connected to the "superhighway;" and teachers would be provided with effective software and on-line learning resources that would be an integral part of every school's curriculum (Dept. of Education, 1996). Proponents believed by providing the tools, thereby increasing accessibility, would somehow guarantee use; use would produce increased learning by students, which would be provided by a more efficient educator; and become a daily classroom routine; and provide a workforce ready for the 21st century (Cuban, 2001). Without this addition to the educational system children would be, as Riley stated, "…at a competitive disadvantage in the new, international marketplace of jobs, commerce, and trade" (Dept of Education, 1996).

Cuban (2001) points to the likeness of introducing film, radio, and television to technology use. Each of these were introduced by reformers consisting of public officials, vendors, executives, and school administrators promoting the use as a solution to educational problems. Policies and dollars were allocated to provide teachers with technology (in the form of media) who were neither involved in the policy making or decision process of how the technology would be used or chosen. Problems arose over malfunctions, a sequencing of needed tools, and compatibility between products and current curriculum goals. Those educators that did utilize it, applied it within existing practice. The disappointment of this technology not meeting the high expectations from investors and policymakers turned to criticism toward teachers and administrators for their failure to take full advantage of the promise the investment had offered. The sentiments sound powerfully familiar.

In 2005, Bauer and Kenton note, despite efforts to increase technology to the quality standard, technology still had not become the learning tool for which it was believed could impact student learning in meaningful ways. One study, interested in the reasons for slow integration compared to acquiring resources, examined 30 "tech-savvy" educated and skilled teachers who were able to overcome barriers through innovative and novel ways. And yet, they did not integrate technology as a tool or utilize it on a daily basis. Findings revealed barriers were student time for computer use, teacher planning time, outdated hardware, integrating appropriate software into curriculum, and student skill levels. Once again, the availability of technology had not led to expectant outcomes. Internet searches and word processes were far from the project-based learning that was planned (Bauer & Kenton, 2005). The question then, has history repeated itself or have we learned from our past and discovered ways of applying technology which has positively impacted educators and the children they teach?

Technology Integration as Defined through Literature

The Department of Education (1996) declared "…technological literacy is not just knowing how to use technology for word processing, spreadsheets, and Internet access. Fundamentally, it is using the powerful learning opportunities afforded by technology to increase learning in academic subjects and increase students' skills" (p. 12). Integration, as defined by literature, provide many varied answers. Some took the viewpoint real integration cannot be taught as a separate subject in isolation. Only the teacher could implement technology that fits the needs of students within the learning context. Technology therefore is most valuable to teaching and learning in schools once it has been integrated as a tool into everyday classroom practice and into the subject matter curriculum (Froese-Germain, Riel, & McGahey, 2013; Hamilton, 2007). Brantley-Dias and Ertmer (2013) found teachers tended to support this view.

Teachers believed technology was another tool in their arsenal as a means to increase student learning. However, for true integration to occur, specific resources must be in place. Each of these are not only important strategies for implementation, but could also become problematic and therefore must be addressed (see, Hamilton, 2007, pp. 25-27).

Integration of Technology by Teachers

After more than 20 years of technology use recent studies revealed teachers still are underutilizing technology for instruction (Gray, Thomas, & Lewis, 2010; Muller, et al., 2008; Pressey, 2013; Rehmat, & Bailey, 2014; Rideout, 2012; Zaho & Cziko, 2001). Even in "tech savvy" schools with skilled teachers, technology was neither used consistently for instruction nor integrated within the curriculum (Bauer & Kenton, 2005; Rehmat & Bailey, 2014). Underutilization was not only prevalent in the U.S., but similar results had been found worldwide (Hermans, Tondeur, van Braak, & Valcke, 2008; Muller, et al., 2008; Yeung, 2010).

Judson (2006) reminded us the "how much" study does not provide a true analysis of integration as it relates to the school setting. The mere existence of equipment does not ensure effective use (Roschelle, et al., 2000).

Gray, et al. (2010), in cooperation with the U.S. Department of Education, surveyed 2005 public elementary and secondary schools. Key findings showed 98% of teachers had computers in the classroom while 52% had access. The ratio of student to computers on a daily basis was 5.3 to 1, a significant increase from the early years of technology introduction. Yet, only 44% of teachers said they or their students used them during instructional time and only 31% used them if they were not located within the classroom. The lack of access played an important part in the implementation. The greatest reported uses were for classroom preparation, instruction, or administrative tasks by instructors. Student uses were less than 50%, most falling in the range of

11 to 45%, and consisted of various activities, such as solving problems, performing calculations, multimedia presentations, movies or design of products. Findings also revealed technology was underused and application towards learning was underestimated. The study did reveal, however, teaching experience did not play a factor in computer usage, supporting similar findings (Muller, et al., 2008; Rehmat, & Bailey, 2014). On the other hand, a comparative analysis of surveys by Pressey (2013) found age did have an impact on use. The Pew Research Center found 64% of teachers under the age of 35 felt comfortable using technology compared to 64% of teachers over 55.

So how do teachers today, learn and apply technology and keep up with the ever-changing, newly developed, and over-whelming influx of materials and products? The National Educational Technology Trends Study (NETS) outlined and determined ISTE standards (see Appendix: F) which were enacted in the year 2000 as a potential guide for administrators, teachers, and students. However, in the absence of grounded knowledge on how to implement the current model it led to many different ways of use, or as Lawless and Pellegrino (2007) state, "…letting a thousand flowers bloom" (p. 577). Most studies, although, do find agreement in one area, technology integration in the actual classroom remained a perplexing challenge (Anthony, 2011; Bauer & Kenton, 2005; Eteokleous, 2008; Gulbahar, 2007). So can current literature aluminate its ineffective use, the possible barriers that continue to hamper its usefulness, and provide a glimpse into strategies that could be used to overcome challenges for technology implementation?

Barriers Towards Implementation of Technology

As Cuban (2001) asserts, "…teachers are the "gate-keepers" (p.167). The content and skills taught and how they are presented all lie within the design applied by teacher instruction.

Teachers face many barriers when it comes to the use of technology integration. Their own beliefs and attitudes; how they plan and establish goals towards successful integration; acquiring appropriate training and professional development to meet specific needs; having strong support systems; and overcoming inadequate equipment and time constraints are issues discovered in literature that challenge technology's successful use. We will look at each to understand their impact on the educational setting and the educator's implementation process.

Teacher Attitudes and Beliefs

The attitudes of teachers toward use were found to be strong predictors of application and outcomes consistent with a value-expectancy theory. Specifically, the implementation of computer use was dependent upon expected success and the value of enhancement on learning. Teachers needed assurances technology would indeed improve learning for students before they were willing to integrate it into the daily educational learning environment (Baylor & Ritchie, 2002; Muller, et al., 2008; Zhao, & Cziko, 2001). Attitudes were also factors for those who viewed computers as a viable, productive, cognitive tool (Muller, et al, 2008) appropriate for use within the teaching context.

Belief systems and pedagogical foundations were predictors of computer use (Hermans, et al., 2008). Cross and Hong (2012) suggested the way teachers perceive themselves (beliefs) determined the course of action they took. They went on to suggest that goal setting played a critical role in how strategies and decisions were executed and thereby determined the classroom behaviors and experiences. Having an invested relationship with students, along with "…a high degree alignment in educational values and goals" (Cross & Hong, 2012, p. 961), lead teachers to display innovative, enthusiasm, and contentment in their work. Findings also revealed, teacher motivations increased as student successes increased.

Each learner was seen as unique and learning a result of their own "…creative self-expression" and experiences (Schiro, 2013, p. 185). The more engaging and richer environment the learner is provided with, the greater potential for learning to take place. The teacher's role is to evaluate and analyze each learner independently, design the environment for rich and engaging experiences, and become a facilitator and valuable resource for students during learning. Many viewpoints regard constructivism as the most favorable method for technology integration. Placing the learner at the center of education development and where the main goal is teaching based on project-based instruction (Schiro, 2013).

Many studies tie the constructivist belief approach to technology use. Studies showed the constructivist approach produced a higher computer application in instructional design and added further support to similar studies (Tondeur, Hermans, van Braak, & Valcka, 2008). However, most studies utilized surveys for the collection of data, which others suggested did not provide accurate results. Self- reported surveys on teacher's beliefs did not necessarily reveal actual practice when viewed by direct observations (Judson, 2006; Palak & Walls, 2009).

So, while some studies suggested that successful integration is tied to constructivism as though one was dependent upon another (Ertmer, 2005), not all studies support the constructivism theory. Some studies suggested teachers used technology effectively with current practice and belief systems in the same manner as before technology was introduced (Cuban, 2001; Palak & Walls, 2009). Still others suggested learning centered ideology developed as a by-product of the evolutionary process as technology was introduced into the learning environment (Koster, Kuipert, & Volmant, 2011; Palak & Walls, 2009). These viewpoints would support the use of technology in the educational setting, thereby increasing a student's ability to learn and provide teachers with the confidence that integration was a viable addition.

Koster, et al. (2011) looked at two schools characterized by having either: (a) a traditional school concept where technology was used to support and reinforce standard teaching materials used in teacher-directed instruction; or (b) an innovative schools where technology supported open-ended, student-directed instruction. The expectation of what technology would offer as applied to teaching goals played a large part in the teacher's choice for technology use. The traditional teacher's goals were to increase student motivation and engagement, accommodate the differences in learning abilities, maintain or increase student achievement, provide teachers with time for other tasks, and provide additional choices for student learning. The innovative teacher goals were to increase active construction of learning content, production of self-made learning materials, provide opportunities for multiple intelligences, and self-directed learning. Findings showed the traditional schools integration into the existing practice was relatively easy and met the expectation predetermined. The innovative schools had much higher expectations for use, therefore the complexity and novel use proved to be problematic and time-consuming for students and teachers. Even though both schools had increases in student motivation, an improvement in learning goals, achieved self-directed learning, and allowed for student differentiation; the differences in the way the technology was used in schools type's verses expectations were significantly different. However, the study did support teachers could use technology within their current belief systems effectively.

A landmark study by Rideout (2012) suggested a change in teacher beliefs were deciding factors in implementation, but Palak and Walls (2009) found beliefs were not strong determinants of teacher's use. Even in technology rich schools, teachers continued to teach within the same belief system as they did before technology was introduced. With the discovery of these findings, training needed to be more specifically focused on integration and individual

strategies for overcoming barriers encountered, not on " one-size-fits-all" model (Palak & Walls, 2009).

Training and Professional Development

Training was found to be one of the major issues facing implementation (Baylor & Ritchie, 2002; Hew & Brush, 2007; Lawless & Pellegrino, 2007; Ottenbreit-Leftwich, Brush, Strycker, Gronseth, Roman, Abaci,… & Plucker, 2012). In order to make technology effective and useful in the educational setting state policies and districts needed to make teacher training a priority. Unless teachers were adequately and appropriately trained technology would not meet the designated purpose. Ringstaff and Kelly (2002) stated, "The principles for creating successful learning environments for children apply to teachers as well" (p. 15). In order to become skilled in technology use educators must be instructed and provided with the tools for learning. To be successful teachers needed the expertise and knowledge to choose appropriate software in order for students to meet specific learning objectives. Muller, et al. (2008) suggested effective design for trainings should include high engagement and be learning-centered and individually focused so that participants could actively engage in the process. Hands-on, direct practice and modeling of others successes could provide the confidence and assurance instructors sought. It could not be "one size fits all" instruction (Anthony, 2011; Baylor & Ritchie, 2002; Brand, 1998; Gulbahar, 2007; Hew & Brush, 2007; Hixon & Buckenmeyer, 2009; Judson, 2006; Ottenbreit-Leftwich, et al., 2012).

Mouza's study in 2005 consisted of a qualitative study of six K-2 teachers and approximately 180 students over a one year period. Teachers were provided with professional development prior to implementation to help them integrate technology and included general teaching skills. One challenge was helping teachers overcome their lack of experience and ability

to envision what the project would look like. The project's success was deemed dependent upon the professional development and training provided before the study could be implemented and was found to be of the greatest benefit to teacher success. Mouza's (2005) greatest discovery was, "Technology can be a wonderful tool for students to learn, create, understand, and explore, but it can only do so in the hands of skilled teachers" (p. 527). A premise substantiated through other studies (see, Rideout, 2012).

In 2007, Lawless and Pellegrino conducted a literature review and outlined areas of need to understand the integration of technology for teaching and learning. They placed the focus on professional development supports. The review uncovered studies suggesting the state of teacher professional development was inadequate and was believed could be attributed to the number of hours required for training. Because of this revelation, the amount of professional development classes were increased in availability. Yet, still unknown was the quality of what teachers learned and the impact it would produce towards student achievement. Other studies pointed to the fact usefulness of the classes were based on how well the class was taught and evaluations were based on instruction, not on content. The conclusion from the review was, "…there is a long way to go in understanding methods of effective practice with respect to the various impacts of these activities on teaching and learning" (p. 575). Furthermore, understanding how to "operate" technology was very different than how to use it for student learning. Working on the premise professional development was critical to provide skills, new methods, ensure effective instructional implementation, and adapt to the new school environments, three main challenges were identified:

1. The lack on empirical evidence on the quality of professional development;

2. The difficulty of defining the integration of technology into learning and teaching caused by the many ways that technology can be implemented; and

3. The limitations and inferences that can be drawn from the literature on what truly makes a difference in this area of study.

Anthony (2011) used activity theory as a framework to examine the impact activities of planning and continual professional improvement had on technology use. The study focused on two teacher's participation in a laptop program over a 3 year period. Although both teachers taught the same grade level and subject, professional develop had an inhibiting effect on integration because of the lack of specificity. Program planners realized teachers had different needs, interests and professional goals and teaching everyone in the same way was ineffective. Allowing for greater ownership by providing individual learning to meet specific goals, as well as time allotted to plan, share, and work with colleagues was shown to increased motivation and implementation.

In addition, Ertmer (2005) found experiences far outweighed courses and instruction through vicarious encounters. Professional development had far less impact than when social interactions with peers or colleagues interacted to help each other, and were able to form small communities of teachers who jointly explored new teaching strategies, tools, and pedagogical beliefs. Self-efficacy refers to personal beliefs about ones capacity to learn or perform actions of designated levels (Bandura, 1993). Building confidence and self-efficacy through successful experiences and modeling was much more motivating and led to increased confidence novice users could be successful with their students. Supports from others, not just teachers and colleagues, but principals, districts and experts were also shown to have a more desirable outcome.

Support Systems

School administrators and district policies can either support or constrain technology use by teachers (Anthony, 2011). Some studies looked at not only training for educators, but administration as well. Dawson and Rakes (2003) investigated and found technology training for principals had a positive influence on teacher's technology integration. Dogan and Almus (2014) found principals trained on iPads resulted not only in administrator's ability to utilize them for administrative tasks, but resulted in positive views for iPad use by classroom teachers as well.

Other studies found leadership played a deciding role in whether or not technology use was successful. Modeling, planning with a clear vision, rewarding teachers when implementation is incorporated, and sharing leadership roles were found to provide positive results. Findings also implied leadership programs can serve a greater role when administrators and other supporters are equipped to help design and lead while being careful not to add further complications to a teachers existing and complex duties (Anthony, 2011; Baylor & Ritchie, 2002; Brand, 1998; Ertmer, 2005; Gulbahar, 2007; Hew & Brush, 2007; Liehucki, 2013; Ottenbreit-Leftwich, et al., 2012; Ringstaff & Kelly, 2002). Yet no matter what approach is taken or support provided towards teaching and instruction, technology without effective planning would be irrelevant.

Implications for Planning Process

Planning without a clear vision of goals and implementation, schools would be unsuccessful in the purpose for which technology was intended (Ringstaff & Kelly, 1994). Gulbahar (2007) looked at how the technology planning processes were implemented in a private K-12 school in Turkey. Questionnaires were provided to 105 teachers, 25 administrators, and 376 students to understand their perceived usefulness and planning processes. Findings suggested even with teachers and administrators who felt competent, a lack of clear guidelines

led to unsuccessful implementation. And although 94% believed technology was important for student success and 87% believed it was useful for themselves, 50% never used computer aided instruction and only 10.5% did frequently. The overall conclusion was planning should precede purchase and training precede implementation. Planning also provided the ability to allocate time effectively for all tasks and recognize early problems in the integration process. With continuous evaluation and revision planning provided a way to keep abreast of the perpetual and rapid changes technology generated. Unlike other resources purchased for schools, computers and software become obsolete, therefore planning insured money and investments were available for future purchases, upgrades, and foreseen and unforeseen maintenance.

A study by Hew and Brush (2007) referenced two types of planning as developed by Tubin and Edri (2004): strategic planning which was long term with clear goals and met technology skill development; and emergent planning that was more general and directed by events and re-evaluation processes. Emergent planning was found to be necessary for creative and project –based learning. They suggested integration takes long term participative planning from all staff and considers the previous year results as it applies to future year plans. Their findings indicated the participants everyday life planning was a determining factor in the type of implementation favored for technology use in school. Unexpectedly, the flexible pattern (open to environmental changes) was more efficient in use because it led to flexibility in the ever-changing environment and fit the challenges technology could produce. Participants who perceived themselves as flexible were more able to cope with challenges, classroom events and student development, and could make adjustments as needed. Participants in the study, therefore, saw the end result of the instruction as successful. Another note on planning for technology as a discipline, was overall implementation of technology was much more flexible

than with other subjects. In other words, they adhered to teaching math, English, etc., but did not always make sure technology was covered in the learning goals. Findings also revealed there were barriers common to all three patterns. The "ridged timetable" for teacher instruction and the common student management led to a "turbulent" environment according to teachers. These factors lead us to look at time and other barriers that contribute to ineffective implementation.

Time and Other Barriers and Challenges

One of the greatest barrier and challenge to teachers is time. Integration is a challenging process that takes time, many studies suggesting success takes between 5 to 6 years (Baylor & Ritchie, 2002, Ertmer, 2005; Mouza, Karchmer-Klein, Nadakumar, Ozden & Hu, 2014). Therefore determining the needs technology can fulfill in the learning process, along with instruction and learning goal analysis should be the guiding force behind technology use (Gulbahar, 2007; Hadley & Sheingold, 1993; Pallas, 1996). Student led research had positive results in elevating some of the time constraints on teachers and also provided students with the ability to learn while performing some of the research that would otherwise fall to the teacher (Anthony, 2011). One of the greatest benefit to the success of teacher participation in using technology was administration support which provided time off for planning and exchanging of ideas between teacher groups (Mouza, 2005). Yet, other studies suggested, even skilled teachers were unable to overcome the barrier of time planning to fully integrate technology (Bauer & Kenton, 2005).

Technological infrastructure has always been a barrier for many schools, even with Federal dollars funding some of the demands (Editorial Projects, 2011). Changing innovations required upgrades and evolutions of new apps and programs challenged teachers to what works best. In order for students to effectively use technology in the classroom, technology must be

available and easily accessible. One study showed having computers in the classroom verses use in the computer lab, produced higher improvement in student's basic skills (Ringstaff & Kelly, 2002). Other studies supported the Bring Your Own Device (BYOD) initiative and believed handheld tools (iPads, iPods) are the answer. While the BYOD may be a possible solution at the upper grade levels, it is highly unlikely to aid with use for younger children. Milman, Carlson-Bancroft and Boogart (2014) point out research has not substantiated or refuted claims iPads raise student test scores, even with the hopes administrators and teachers have placed on them. Employing a mixed-method case study of seven teachers in Pre-K through 4th grade Bancroft and Boogart's study looked at teaches integration of iPads within the classroom. Most of the teacher's use resulted in complimenting or enhancing existing lessons, provided for student choice in lesson engagement, and/or student discovery of deeper meaning for learning content. Findings from the study showed 86.7% of teachers agreed iPads had positive impacts on student learning.

Another study by Khalid, Kilic, Christoffersen, and Purushothaman (2015) explored articles to review and investigate the barriers faced with using iPads in the learning environment. There were fundamental challenges discovered: 1) iPads were not designed as a learning and teaching tool; 2) iPads were a constantly changing tool and therefore many discussion were taking place in literature as to the effective use as a teaching tool; 3) cost was seen as a major barrier (in the US as well as other countries) and; 4) the size of the iPad presented challenges with group use, as well as writing assignments.

Hew and Brush (2007) pointed to a study by Schnellert and Keengwe (2012) that explored the use of laptops instead of towers, and suggested wireless access could save on expenses and building maintenance costs. Yet even then, other barriers for implementation still

existed. Most 1:1 laptop initiatives were taking place in upper level grades and would not have a direct impact on the elementary school needs. Findings from the Mouza study (2005) revealed some of the greatest challenges to implementation were the infrastructure which caused failures and glitches. These glitches were problematic in that they disrupted the activities and flow of each unit of the study. Technical support in a timely manner was another major barrier (Ringstaff & Kelly, 2002). Even with technology changes, this remains an issue in the current system.

Summary

Literature, indeed offers insights to why integration of technology has not occurred and had the impact hoped for on student learning. A host of factors have been found throughout literature which hamper the implementation of technology by teachers in the school setting. A teacher's belief system and knowledge base because of ineffective professional development and incorrectly implemented trainings; lack of, or ineffective support systems; lack of funding; deficiency of equipment and access; and most importantly time all have an impact on how technology is utilized. Can an ongoing conversation by all stakeholders, especially teachers, provide the answers to aid in the development of strategies to overcome the problems that plague the ability for successful implementation?

Chapter 3 will provide an introduction to the current study, its research methods, purpose and design, setting, procedures, participants, data collection techniques and analysis. Chapter 4 will layout the results discovered and Chapter 5 will look at potential guidelines for implementation, recommendations for further research, and the conclusion. .

CHAPTER THREE: RESEARCH METHODS

Introduction

Chapter 3 will present the study purpose and design, the setting, a detailed listing of participants and how they were identified, and the procedures and instruments used. Appropriateness of methods utilized will be discussed and lastly the methods of data collection and analysis are described.

Study Purpose and Design

Purpose

The purpose of the current study was to investigate the definition of integration of technology by elementary teachers in selected Brevard County Schools and barriers that hamper their ability to integrate technology effectively. Muller, et al. (2008) stated, "…it is critical to understand teachers' perspectives regarding computer integration in the classrooms" (p.1523). Allowing teachers to voice what integration means to them in both practice and definition and the barriers they encounter that hamper their ability to integrate technology could provide insight into the lack of technology use established in literature. Discovering strategies to benefit the development of policies and improvement for training is also a possibility.

Research Methods

For the current study a qualitative, investigative approach was utilized based on the belief it would provide a more accurate answer to the research questions proposed. It also provided a more thorough understanding from the teacher's perspective. Establishing creditability for the current study was overcome by member checks, triangulation, and phenomenon recognition. The strength of semi-structured interviews is the lack of misunderstandings that can occur between

the interviewer and participants, thus providing a more accurate and in-depth picture and flexibility. Member checks (seeking feedback from participants) was used to further rule out the possibility of misinterpreting the meaning of what was said and teacher perception, as well as researcher bias (Merriam, 2009). Checks also involved inspection by the participants through "phenomenon recognition" that enabled the participants to verify what was determined by the researcher was a clear representation of the "reality" of their shared experiences (Guba & Lincoln, 1981). The use of multiple methods, sources of data, and studies to confirm findings (triangulation) was used to increase validity. Generalizability was not a factor in the current study. A small non-random, purposeful sample was selected to understand the particular in-depth answers to the research question formed. It was not intended to make discoveries for the multitude. However, the similarities of findings through "sufficient descriptive" data could make transfer possible if situations were similar, but not identical (Merriam, 2009).

Through a multi-site investigative study design (Creswell, 2007), two individual interviews and focus group interviews (n=6, n=8) were conducted with a focus on understanding the practices and experiences of the participants. Data was collected through a demographic questionnaire and interviews with individual teachers and focus groups. Triangulation of the data provided for consistency and validity of the study.

Setting

The researcher chose Brevard County as the setting for the current study based on:

1) the researcher resides in the county;
2) had familiarity with district policies and procedures because of prior employment for 3 years as a substitute teacher for Brevard County Schools; and

3) because of my employment had formed relationships for possible participants and contacts in order to conduct the study.

Brevard County is located on the east coast of Florida and serves more than 70,000 students. It is ranked as the 10th largest district in the state and 48th largest district in the United States. It is considered the single largest employer in the county and employs more than 5,000 instructional personnel. The District has 62 public elementary schools and students come from a wide variety of ethnic backgrounds. The following table represents the student ethnicity breakdown within the county.

Over half of the student population is white (58%), almost equal portions of black/African American (13%), Asian (12%), and Hispanic/Latino (9%) students and the rest falling within 2 or more races and American Indian/Alaskan.

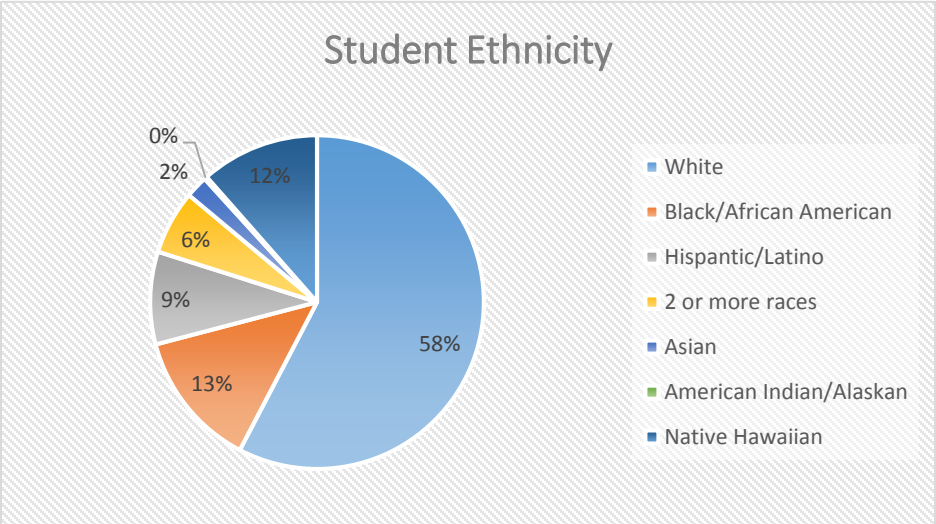

Figure 1: Student Ethnicity

Selected schools were chosen for the study based on Brevard's Division of Educational Technology recognition of Achievement Through Technology AndINnovation Award (ATTAIN). (www.brevardschools.org/trial-attain).

> The purpose of the award is to identify and promote outstanding technology practices in Brevard County Schools. Leading by example, such schools employ technology to support and improve learning, teaching, and administration. Consistent with the national standards put forth by the International Society for Technology in Education (ISTE). The award endorses efforts aimed at ensuring the necessary conditions to effectively leverage technology for teaching and learning.

The ISTE foundation is based on having a shared vision of integration of technology between all stakeholders; planning for implementation based on student-centered learning; skilled teachers and support staff; professional and ongoing learning; coupled with community partnerships and collaborations (www.iste.org/standards).

From 2009 until 2014 there were 26 total elementary schools chosen to receive the ATTAIN award. Eight of these schools were selected for the current study based on the following reasons: (a) their location provided an even distribution within the district; (b) an examination by the researcher based on the ATTAIN projects awarded; (c) the schools were in close proximity to the researcher; (d) one school was based on a personal contact with the participant; and (e) the administrator and teachers were open to participating. Out of the eight (n=8) schools contacted, one-half (n=4) responded. Two of the schools chose to participate in an individual interview session and two chose to partake in focus group sessions (n=6, n=8) and one principal, providing a total of 17 participants. School names were excluded from the present study to protect the anonymity of the school and its staff members.

Research Question

Through an investigative, qualitative approach the present study was guided by the following questions:

1. How would elementary teachers from selected schools in Brevard County, FL define what the integration of technology into instruction means?

2. What are the distinctive barriers which prohibit them from integrating technology successfully for instruction in student learning?

Procedures

Participants

Participants were "identified by purposeful sampling, based on the assumption the qualitative researcher wants to identify, discover, understand, and gain insight, and therefore must select a sample from which the most can be learned" (Merriam, 1998 in Bauer, 2005, pg. 524). Participants involved in the study were identified through personal contacts, referrals, and self-selection. With mandates in place for technology use by teachers in the district, it was believed all teachers could provide valuable insight. Therefore, there were no definitive set of characteristics required to be accepted into the study, only a willingness to participate. The study consisted of two individual face-to-face teacher interviews (Individual A and B) and two face-to-face focus group interviews (Group A and B). The two individual teachers were from two separate schools who volunteer through email request. The two focus groups were from two different schools, one respondent, the principal, set up the focus group choosing teacher participants and the other a friend of the researcher whom gathered teachers to partake in the study.

Individual A

Individual teacher A taught science and social studies to 6th grade students. The classroom consisted of five individual computers and 20 iPads which were housed in the classroom and shared by the other 6th grade teachers. A grant (initiated by the teacher) had also provided two computer microscopes and software available for student use. The structure of the room provided for easy access to all equipment, as well as classroom management. Students were able to use the equipment whenever it was needed for internet research, group collaborations, and support of instruction. All textbook materials were available through computer access only. The teacher was available only after school hours and therefore an observation of the classroom with students present was not an option.

Focus Group A

Focus group A (n=7) consisted of 6 teachers (K, 2-6th, K-6 Title 1) and the principal. The principal sent emails to all staff and made selections for participants based on acceptance. Classroom observations were not made at this facility as the meeting was prearranged by the principal after school hours, so there was not room structure to report on other than that which was gathered through conversations and discussions However, it was explained the Title 1 class consisted of computer assisted instruction only and was used for remedial learning. Classrooms were provided with one iPad and unclear was the availability of personal computers which existed in individual classrooms. Only one of the six teachers had a designed websites with personalized newsletters.

Individual B

Individual teacher B taught Kindergarten students. The classroom consisted of two individual computers, one teacher laptop used for various group activities, two iPads, and two

Nooks. The structure of the room provided for easy access of equipment, as well as classroom management. The schools website was non-functional and so there were no teacher newsletters or communication with parents constructed except through written or oral methods. Observation of the classroom took place directly after the interview and lasted for approximately one hour in order to understand how children and the teacher used technology, for what purpose, and how time with technology was managed.

Students entered the classroom at 8:00 AM, had an individual paper assignment ready as seat work and were instructed to do them upon arrival. Once completed, a student chose another student at their table to correct each other's work and was then placed in a daily bin for the teacher. Groups of students (approximately 4-5) were allowed to choose a math game on the iPad for free time until all students had finished their individual work. Students were instructed to play one game and then pass the iPad on to the next student and so forth so that all would have an opportunity to play. This was not supervised by the teacher and one group of four girls did not following instruction. It was observed one girl played while the other two watched and the fourth was excluded from the group. She in turn became visibly upset, began to cry and when the teacher intervened, they reported she had in fact had her turn (and had not) and the problem remained unresolved. One other group of three boys chose to play the same math game on the iPad and did so without incident. Play lasted approximately 6-10 minutes.

One student was assigned to use the teacher laptop computer during group instruction. The student was chosen at the beginning of the week to turn the computer on and off, sat at the teacher desk and made the selection of instructional videos one for phonics, an alphabet song, and one for days of the week. The teacher explained the videos, had been downloaded from YouTube a couple of years earlier and were quite out of date, but because YouTube no longer

allowed free downloads new ones could not be accessed. This was written and included in the lesson plan as student computer use.

No other computer use was observed during the hour of time spent when students were present. However, the teacher, and supported by the lesson plan, identified student computers use for drill and practice in the area of math and phonics, as well as the free time centers for gaming selection. Two Nooks were also available, but the teacher explained she had no training on the use of the Nooks and because of this they were not utilized for student or classroom purposes. There was a computer lab at the school, but was not available for the 2014-15 school year for the younger grades, as the science lab was assigned instead. The lab, as it was explained, was reserved for 6th grade students exclusively this year, and for the preparation and testing for the new Common Core State assessments. There was one computer in the library (media center) but was only available during student's scheduled, once weekly visit.

Focus Group B

Focus group B (n=8) consisted of 8 teachers (3-K, 3-1st, 2-2nd). Classroom observations were not made at this facility because of the time the meeting took place. Only the classroom in which the meeting took place were classroom observations made. The meeting was held in one of the 1st grade classrooms and there was 2 PC computers for student use arranged for free time and center use and easily accessible for student use. The other teachers reported room structure for their classes were similar for computer use as well. Teachers reported each classroom had one iPad per classroom and two to three classroom computers.

The media center (library) housed 20 iPads on a rolling cart available for checkout by any teacher when available. The computer lab was available for teacher-led, 30 minute sessions on an assigned basis, and contained 20 computers. Because it was no longer staffed, there were times

when it was unavailable for use, as well as the last three months of the school year (taking place when I visited) for Common Core Assessment purposes.

The researcher met the participant(s) at their school location and at their convenience for all the individual interviews and focus group sessions. There were no reasonably foreseeable risks or discomforts involved for participants. Also, no benefits were promised, however, possible benefits included information about technology integration shared by others during the focus group interviews. A token gift for participation was provided for the focus group session in the way of snacks and the individual interviews were given a $5.00 gift card for Starbucks.

Data Sources

After receiving permission through the IRB board (see Appendix A) and the Brevard County School Board (see Appendix B) letters were sent to out or hand delivered to the Assistant Principal or Principals of selected schools for permission to contact potential participants (see Appendix C). All teachers in the selected schools were sent out emails seeking participation, and or, through personal contact. Additionally interviews and focus groups were chosen instead of surveys on the basis of previous research which showed only through testimonies were relevant uses of technology integration revealed (Palak & Walls, 2009). All the participants completed a 19 item demographic questionnaire for general collective purposes, before the interview began. The participants interacted only with the researcher throughout the study.

All participants in the individual and focus group interviews were provided with a copy of the consent form and guaranteed anonymity (see Appendix E). Personal data collected for the current study was coded by the researcher, which only she had access to, and all identifiers were removed. Promise for complete secrecy during the focus group session was not guaranteed, but it was recommend to the participants not to share identifiers with anyone outside of the group. In

addition to the consent form, all the above information was explained before the interview began and participants were provided with the opportunity not participate if they so choose. The conversations were recorded to insure conversations were correctly interpreted. All participants were then emailed a completed transcription for approval and permission to add or make adjustments as needed.

Data Collection

Through a multi-site investigative study design (Creswell, 2013), two individual interviews and two focus group interviews were conducted. For both the individual and focus group interviews, participants were given a consent form (see Appendix E) and then asked to complete a19 item questionnaire for general collective purposes. The questionnaire (see Appendix D) questions 1-8 covered age, years of teaching, the use of technology, training, and barriers. Questions 9-19 used a Likert scale from 5=strongly agree to 1=unsure on teacher beliefs, barriers and supports, and training initiatives.

The individual interviews were based on 15 open-ended questions (see Appendix D) on the use of technology and its impact on elementary classrooms and instruction. Verbatim transcripts were made from the taped interviews for accuracy. Questions were used to determine perceptions of technology integration, the definition, planning, beliefs, professional training, barriers and strategies, and directives for use.

The focus group interview (see Appendix D) was based on 11 open-ended questions on the definition, use of technology, and the impact on elementary classrooms and instruction. Verbatim transcripts were made from the taped interviews for accuracy and as a backup for the researcher notes. For each, individual and focus group meeting, a one-time scheduled session for *each* required approximately 30 minutes of the participants time. However, most of the

interviews and focus group sessions lasted from 30 minutes to one hour in duration. Follow up emails were sent to all participants along with a transcribed copy of the interview for verification of the conversation. Responses were obtained from both individual interviewed participants and three teachers responded from the focus group sessions. A "no response" was understood by the researcher as being in agreement with the results.

Data was also collected from documents and artifacts. Documents examined included teacher lesson plans, school newsletters from teacher websites (2 out of the 16 teachers developed one of their own), and teacher responses to questionnaires. Artifacts examined included student multi-media games and projects selected from reported uses through teacher conversations.

Researcher as an Instrument for Data Collection

Qualitative researchers are interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences (Merriam, 2009). In qualitative studies the researcher is also the main instrument for data collection and analysis, and utilizes a rich description of words and pictures to convey what has been learned (Merriam, 2009). In order to establish trustworthiness for the study the researcher, as the main data collection instrument, must disclose potential bias that would hamper the creditability of the study.

My first plan for the study was to examine the impact technology had on learning and the potential physical impacts technology could have on elementary children. Through the guidance and direction of professors, the grand scale of my efforts were narrowed down to a more manageable focal point. Throughout my search of available literature a pattern began to surface. The lack of voices from elementary teachers was absent from many of the studies; describing not

only the meaning of technology integration, but the barriers teachers faced when implementing technology for instruction. Many of the barriers and challenges found in the current literature were constant with issues addressed in early studies of technology use. The implementation of technology into the field of education, and the underutilization by teachers was still evident. Something was missing and I believed teachers held the answer. I also believed the methods relied upon for those answers were insufficient. Surveys had been the main methodology used for data collection, I wanted to provide a better way for teachers to tell their stories.

I have been in the education field for over 25 years. I am currently employed as an education coordinator teaching technology and photography to adults with disabilities. I have taught P-K through 4th grade, written and conducted trainings in early education, worked in Brevard County schools as a substitute in K-6th grade, and served as Assistant Director for a private preschool. In my current position as a technology teacher, I understand the time required to develop individual goals for 50 clients, each with individual learning needs and the overwhelming amount of apps and materials available. I understand the time it takes to find and utilize materials and apps for learning. Each client is at a different level and all materials must be constructed and individualized to match learning goals and objectives. I can empathize with teachers and understand their frustration when it comes to having too much to do and not enough time. Time is not a commodity teachers ever have enough of. I have also shared many conversations and stories with others in the field on mandates, the pushing down of learning requirements to younger and younger grades, and the plight of teachers to be able to teach in a way that supports each child and instills a love of learning within them.

When approaching the interviews I also understood the importance of retaining neutrality and not allowing my own point of view to alter the conversation in a way that would influence

participants' responses. Having a BA in Developmental Psychology, the ability to listen to others without judgement or intrusion is also a strong part of my background and training. Each participant was provided with the interview questions before the interviews began and throughout the interview I was careful to ask only the questions listed on the interview sheets. I did find myself nodding in agreement when my viewpoints aligned with what was being shared, but was careful not to voice my own opinions before or during the interviews so as to not have an undue influence on the conversations. There were times I asked additional questions inorder to further clarify responses. Participants were given the opportunity to revisit any question in order to add additional thoughts not previously covered. Follow up emails were sent to all participants along with a transcribed copy of the interview for verification of the conversation. Responses were obtained from both individual interviewed participants and three teachers responded from the focus group sessions. A "no response" was understood by the researcher as being in agreement with the results.

Analysis

The transcripts, field notes from observations, lesson plans, and dialogue were reviewed and coded continually. Emerging themes were added and reviewed after each data collection date. A construction of categories or themes served as a conceptual element and covered many individual examples to capture reoccurring patterns derived from the data. Categories or themes, according to Guba and Lincoln (1981) are able to provide answers to the research question(s) and should be able to contain all data obtained of importance or relevance. Coding text was accomplished by utilizing Microsoft Word and Excel. Utilizing Word's comment feature to code text I then transformed text segments to a table for analysis in excel. A triangulation of data was accomplished by using a variety of sources which included observation,

interviews to provide differing viewpoints, teacher responses, and studies discovered through the review of literature.

Development of Categories

Bogdan and Biklen (as cited in Hoepfl, 1997, p 145) defined qualitative data analysis as working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others. The initial coding from the interviews were developed starting with themes that fit into relevant categories described from literature. After each interview session, data was transcribed verbatim, typed into a word document and then converted to excel tables for coding. Each additional interview was added and coded continually. Specific words, themes, patterns were developed into categories determined by questions and relevant literature. Additional categories were added based on conversations and found to be relevant to the study.

Summary

The current study employed a qualitative, investigative approach based on the belief it would provide a more accurate answer to the research question(s) proposed. The approach also provided a more thorough understanding from the teacher's perspective, thereby adding teacher's voices to the literature base. The current study investigated how technology integration was defined by teachers in elementary classrooms in the Brevard County Public School, and barriers and challenges that hamper use. The findings provided a better understand of the impact technology had on elementary classrooms and the ways teachers currently integrate technology for instructional purposes.

The study purpose and design, procedures, and analysis were presented in Chapter 3. The results from the data analyses, barriers encountered, and strategies for integration will be

presented in Chapter 4. Chapter 5 will include an overview of the study, possible guidelines for implementation, recommendations for future research and final thoughts.

CHAPTER FOUR: RESULTS

Introduction

The current study was to understand, from an elementary teacher's perspective, their definition of technology integration and the barriers and challenges they face when implementing technology for instruction. Chapter 4 will describe school and participant demographic data, and the reveal the results obtained from the demographic questionnaire and findings discovered from the interview(s) developed through individual and focus group sessions.

Findings

School Demographic Data

Schools selected for the study were located from all areas of Brevard County (north, central, eastern, and south areas) and as a result are believed to provide a fair representation of the Brevard school district as a whole. Student enrollment from the selected schools ranged from 875 to 315 students for the 2013-2014 school year.

Participants Demographic Data

Participants were asked to complete a demographic questionnaire before the interview consisting of two sections. Section A provided for (a) background information, (b) use of technology within the classroom setting, (c) previous training and professional development, and (d) unmet needs for instructional purposes. Section B consisted of 11 questions based on 1-5 Likert scale (5=strongly agree, 4=agree, 3=disagree, 2=strongly disagree, 1=unsure). Questions addressed teacher beliefs, training/professional development, support, and barriers in order to establish a basis for comparison on similar questions developed for the interview(s). Background information will be presented separately and other data from the survey will be utilized for

comparison purposes and reported along with the interview results. Notes: Numbers are the coded amount of responses from the participants during the interview sessions.

Section A: Background Data

The grade level of selected teachers ranged from Kindergarten to 6th grade with Kindergarten making up the highest percentage (31%) of teachers interviewed. One Title 1 teacher who took part in the focus group interview, reported his class consisted of only computer instruction. He stated, "They are on the computer the whole time in my class, and work on filling in the gaps. When they finish I send them back with "faith based" belief that they will take what they have learned with them" (Teacher A001). His classroom was established for remedial learning skills to support all grade levels. The following table shows the percentage of teachers from each grade level who participated in the study.

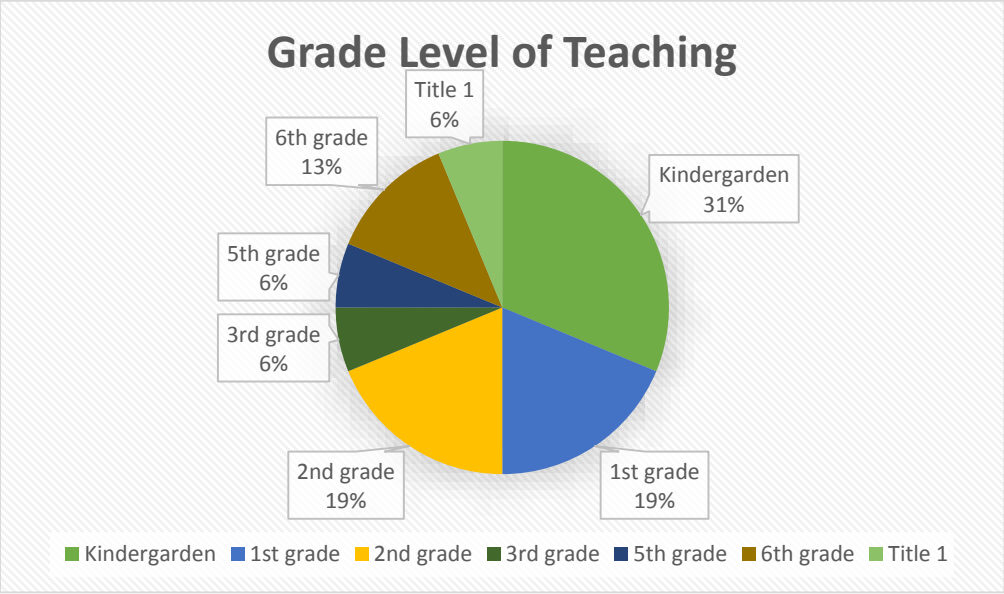

Figure 2: Grade Level of Teaching

One Principal took part in the focus group interview and provided valuable insight from an administrative perspective.

As seen in the tables below participants were comprised of teachers of all ages and years of teaching equally. The age of teachers ranged from 21-50 years old, and 41-50 years old made up the highest range at 36%.

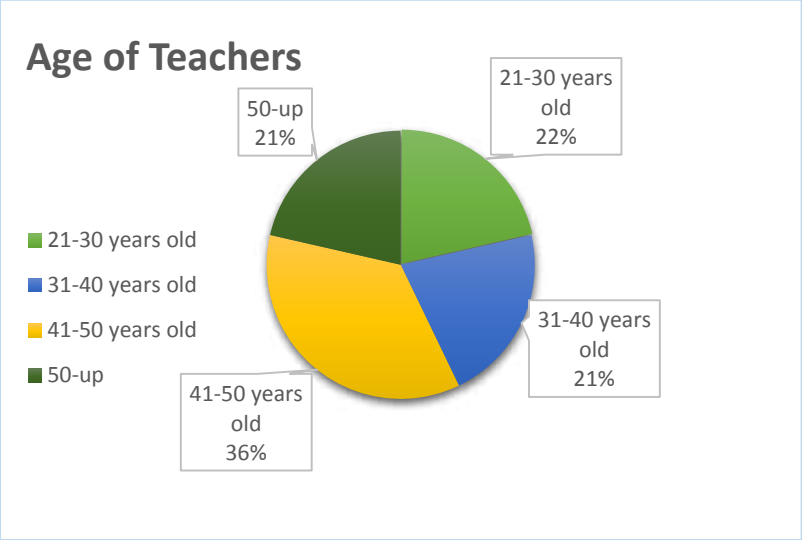

Figure 3: Age of Teachers

The following figure displays the number of years the participants had been teaching. Findings showed participants were distributed across each range of years equally and was believed to provide a fair representation of novice to experienced teachers.

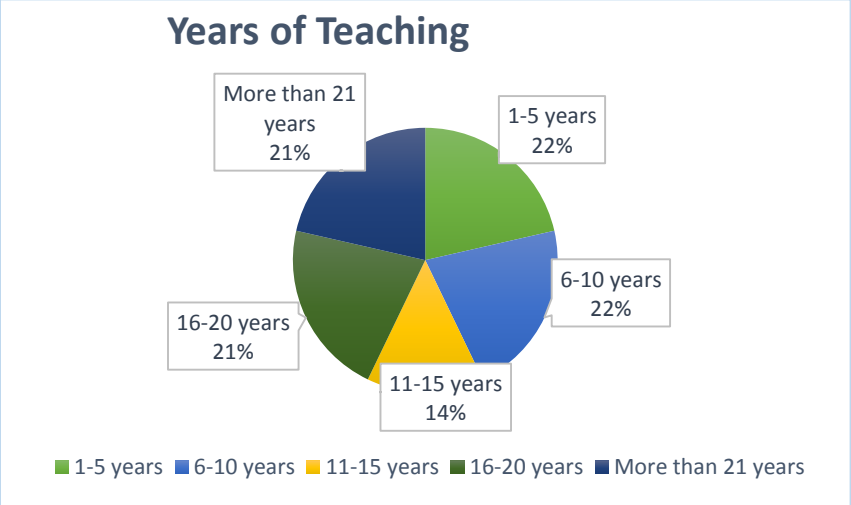

Figure 4: Year of Teaching

Unclear was whether the years of teaching by participants was within the same grade level as when the data was collected. Some studies in the literature suggested age and experience could play a role in the underutilization of technology. Results from the current study, however did not reveal a significant impact on the underutilization of technology for instruction some of the studies suggested (see, Muller, et al., 2008; Pressey, 2013).

Findings

Research Question 1: Definition of Technology Integration for Instruction

The survey questionnaire revealed 57% of participants believed technology was pertinent to the curriculum. From the interviews conducted, respondents frequently commented technology was an extension of student learning (17 responses); a tool that enabled teachers to identify individual child learning needs (33 responses); provided parents the ability to stay connected to their child's learning (16 responses), and provided students a way to connect with classmates and others in the world. One teacher stated, "Parents can access their child's learning from home. They can see, it provides them with ideas of how to help and they can collaborate with their child's work from home" (Teacher A006). Another stated, "…the children aren't using it passively. They are actually using it to learn, as a tool. So, we're not just showing a video, and they're using the iPads to just play a game, but they are actually using it to learn a concept or learn how to do something" (Teacher A004). And another said, "It means, and I would call it a spectrum, because it would be integrating technology for my own instruction, like using a power point, or using clickers. That really is about me using it as a tool. On the other end would then be them using technology to learn and create something on their own" (Teacher S001).

One classroom had created a blog with a group of students from Poland and kept in touch throughout the year. Teacher A002 set up a summer communication site (Edmodo, the largest K-12 social learning network) so that her students could sign on and talk with each other. Because of the communication site, a former student was able to stay in touch and let everyone know what he was doing. "The children really loved it. It is a collaborative thing they really want" (Teacher A002).

When participating teachers were asked about their degree of overall knowledge of current technology, 79% of participants stated they were experienced, 21% were intermediate, and none reported themselves as novice or non-users. Analysis of teachers' interview responses revealed technology was underutilized by students and teachers, even though 100% of the teachers believed technology was important for student success. One teacher responded, "The expectation is, that we do, that we integrate technology, we do focus questions, we do higher level learning. That's in theory, higher level, at a very high level, and it's just not reasonable" (Teacher M003). Later in the conversation another teacher went back to clarify her viewpoint stating,

> "I want to say something about the integration piece. I try and use mine for enrichment, like integrate it in an enriching way. Only because I have some higher level students that can do it, and are very comfortable, fluent if you will, with an iPad. And I am able to take those three in a small group and kind of go through, making a product or whatever" (Teacher S001).

Participants also reported themselves as competent users and comfortable using technology. Seven of the participants reported daily use of technology for instructional purposes, four weekly use, two monthly use, and one reported no technology for instruction by themselves or by students.

Participants (78%) agreed with the statement, I plan and teach student-centered learning activities and lessons in which students apply technology tools and resources, however not all of the responses were positive in their remarks. Analysis of teacher's interview responses revealed eight sub-categories for how technology was utilized ranging from:

1. Assessment purposes: (33 responses) which allowed for deeper understanding of individual children's needs; some reported could not be done as well without technology.
2. A teacher tool: (29 responses) as a replacement for files and folders, backup of materials, a replacement for all of the paperwork. Over half of the teachers reported technology was just another resource in their "toolkit."
3. Engagement (17 responses) One teacher responded, "Basically it was about, what's going to grab them, and their way more engaged, than if I say "here's a pencil." Not that they don't have to do that too, and they do. But it's sort of like trying to mix it up and grab them" (Teacher S001) Another teacher stated, "…when I have those iPads, man they're all focused and they're all on task " (Teacher M003). Another stated, "Everything is expected to be immediate, like this (snapping)… That is a big drawback" (Teacher M001).
4. Drill and practice: (9 responses) to provide additional support for specific skills and used mainly for math concepts.
5. Home to school communication (10 responses)
6. Collaboration (8 responses) with parents and classmates. A teacher responded, "So at first when they were learning that, (BrainPop) Mary would go over and teach them and now they've learned. So they didn't learn it from me, they learned it from her. So they are teaching each other" (Teacher J005). Another one said, "They've been teaching the

> others in the classroom and it works good too. But that's because I had those that were already having come to me already knowing a lot about the background of iPads and technology and so that made it easier. I didn't have those kids it might have taken a lot longer. You know training them, and they liked, gained a lot of self-confidence by being able to teach another student how to use it" (Teacher S001).

Research Question 2: Distinctive Barriers which Prohibit Successful Integration

Categories or themes, according to Guba and Lincoln (1981) are able to provide answers to the research question(s) and should be able to contain all data obtained of importance or relevance. The main themes and categories from the current study which addressed barriers were developed from topics covered by the research questionnaire, individual interview, and focus group questions. These themes directed the beginning development of the coding process and are as follows: a) training/professional development; b) equipment; c) time; d) instructional use; e) support; f) collaboration; and g) direct barriers and challenges. Several of the categories and subcategories matching similar items were found within the literature: (a) attitudes and beliefs which contained a subcategory of technology use for instruction, (b) training and professional development, (c) support systems, (d) time, and (e) equipment that inhibits integration for instructional purposes (Baylor & Ritchie, 2002; Hew & Brush, 2007; Lawless & Pellegrino, 2007; Ottenbreit-Leftwich, et al., 2012).

The interview questions produced two additional categories that surfaced from recorded conversations: funding and security issues. Neither of these responses resulted from direct questions, but came about during the interview sessions as barriers faced by teachers. Funding, or lack thereof, was mentioned by all participants when talking about the cost of replacement for out-of-date equipment, iPads that were purchased by grants sought out by teachers, and apps for

the iPads teachers purchased with their own accounts due to the lack of funding. One of the participants also mentioned during the interview, apps could be purchased by the media center specialist from book drive money, however there was not always money remaining after other supplies were purchased.

Security issues were not of significant concern, due in part to the Edmodo system. "Edmodo takes learning beyond the classroom by providing a free, safe place for teachers and students to connect and collaborate—anytime, anywhere" (www.edmodo.com). All of the participants in Focus Group A reported Edmodo was used for home to school communications. One of the sixth grade teachers spoke about internet use conducted by her students and the possibility of them accessing unwanted sites. She went on to explain she kept a close eye on them when they were doing research and they knew she was watching. Both of the security challenges mentioned by the teachers are supported by related research (Editorial Projects, 2011).

The formation of categories, which served as a conceptual element, covered many individual examples and captured reoccurring patterns derived from the data. Coding text was accomplished by utilizing Microsoft Word and Excel. By using Word's comment feature to code text I then transformed text segments to a table for analysis in excel. A triangulation of data was accomplished by using a variety of sources which included observation, interviews to provide differing viewpoints, teacher responses and studies discovered through a review of literature. During further analysis of the data subcategories were added as the researcher read and reread the interview sessions. Subcategories stemming from time were developed based on responses from recorded conversations and revealed time was a major challenge that directly impacted, positively and negatively, many other barriers.

The following table reveals the main theme and categories derived and provides evidence to address barriers which prohibit teachers from integrating technology successfully for instructional purposes. Following the table is a further analysis of each category and participant responses.

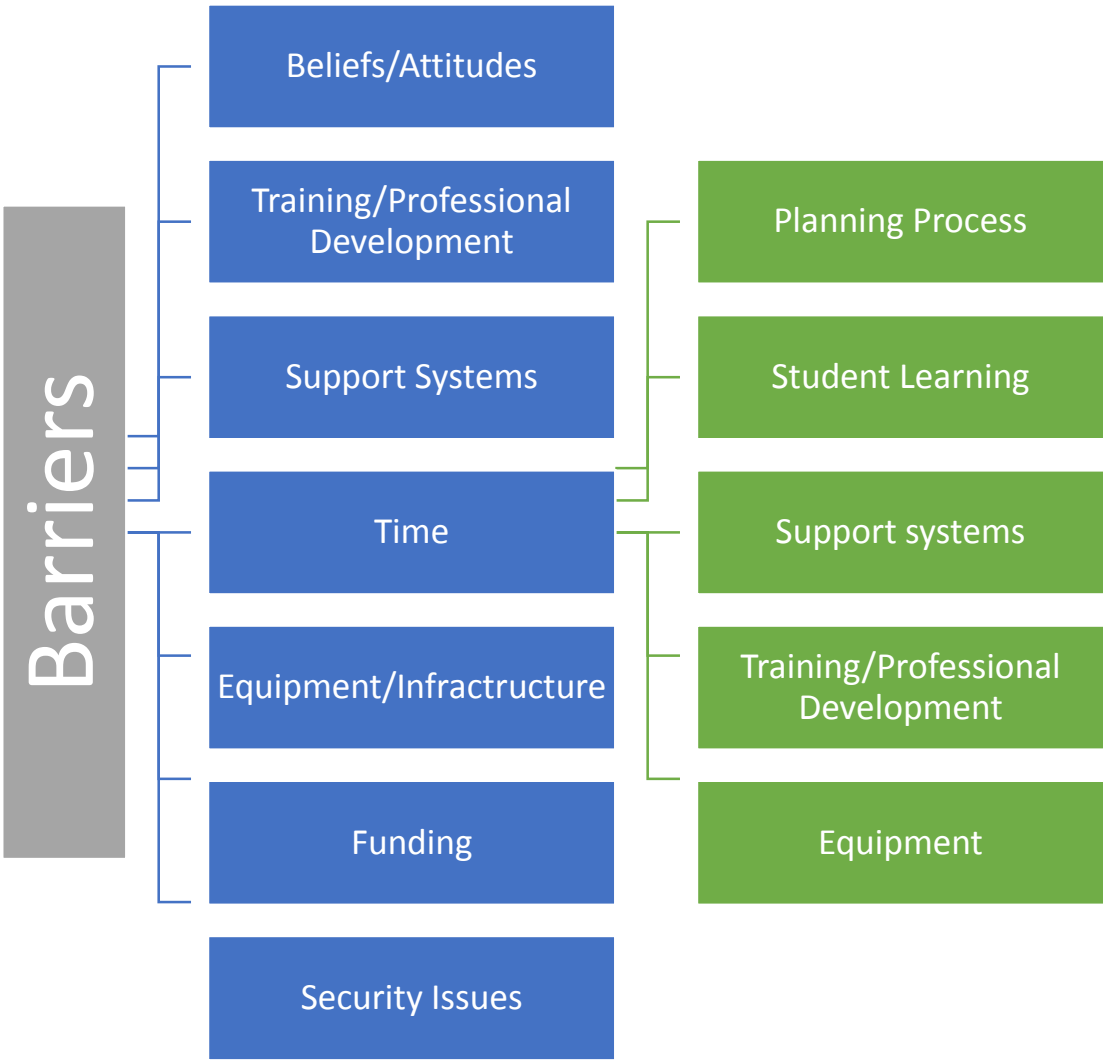

Figure 5: Analysis of Barriers

Teacher Beliefs and Attitudes

Most teachers in the current study overwhelmingly believed the utilization of technology for instruction was important for student success (48% strongly agreed and 52% agreed). However, participants during the interviews revealed more negative (23) than positive (17) responses when asked: Do you believe technology positively or negatively influences student learning? One teacher stated, "I think it positively does, as long as it's used the correct way. I think we have to use it as a resource, because students are being impacted" (Teachere M008). A sixth grade teacher stated, "I would imagine my frustration level would be huge if I had 1st graders with the attention span of lint, and I'm trying to do something and they can't… I mean I have a group of young adults that, it's probably different for me in that experience" (Teacher S001). And a first grade teacher stated, "Everything is instantaneous, and that is difficult when you are trying to teach, especially primary children…they don't realize that it is a process that you have to be patient and you have to continually work at it because it's not going to happen overnight. That is a big drawback" (Teacher M001).

Positive responses from the participants to the inclusion of technology for instruction included the ability to gage students learning levels. Many agreed it freed up the teacher to focus their attention on other students and group learning. Others believed communication between home and school were important and had positve impacts on their students. One teacher stated, "As a school, it opens communication with other teachers and parents. Some parents do not have access to a car, due to the layoffs in the area. They can not see what their child is doing. With computers, they are capable of accessing student learning at home (with computers) and they can see what their child is learning. It is also another way students can read and do homework at home" (Teacher A003).

Data from the current study showed a difference in the teacher's belief of student's interaction with technology. The student's ability to use technology independently, as well as their knowledge base, was believed by participants to increase with each subsequent grade level. However, the teachers' implementation of technology within the classroom setting did not increase. As one sixth grade teacher replied when asked, "Do you currently use technology in the classroom for instructional purposes?" she replied, "Yes, I've increased the use, purposely over the last couple of years to broaden my own sense of what I can use." She went on to explain that her students were her teacher's, "It's a language they know, so it is a total learning experience, cause they know" (Teacher S001).

Training and Professional Development

Brevard County Schools provide teacher training for technology use through the PAINT Academy (Planning and Implementing New Technology). Only one of the teachers reported attending the Academy and stated, "… it's not applicable to what we do. I sat there for a whole day and it was all about what my kids could not do. They jump from one program to another, oh my gosh…it was too much" (Teacher M003).

Questionnaire survey results showed participants training hours ranged from 0-to more than 20 hours. Half (50%) of the participants reported receiving more than 20 hours of training. However, because of the nature of survey results, unclear was how much direct training for technology implementation or what format was used for training purposes.

When participants were asked in what ways they learned to use technology the results showed 3% learned from their students, 28% learned through independent means, 36% from colleagues, and 33% from professional development or training courses. The table below reveals these findings.

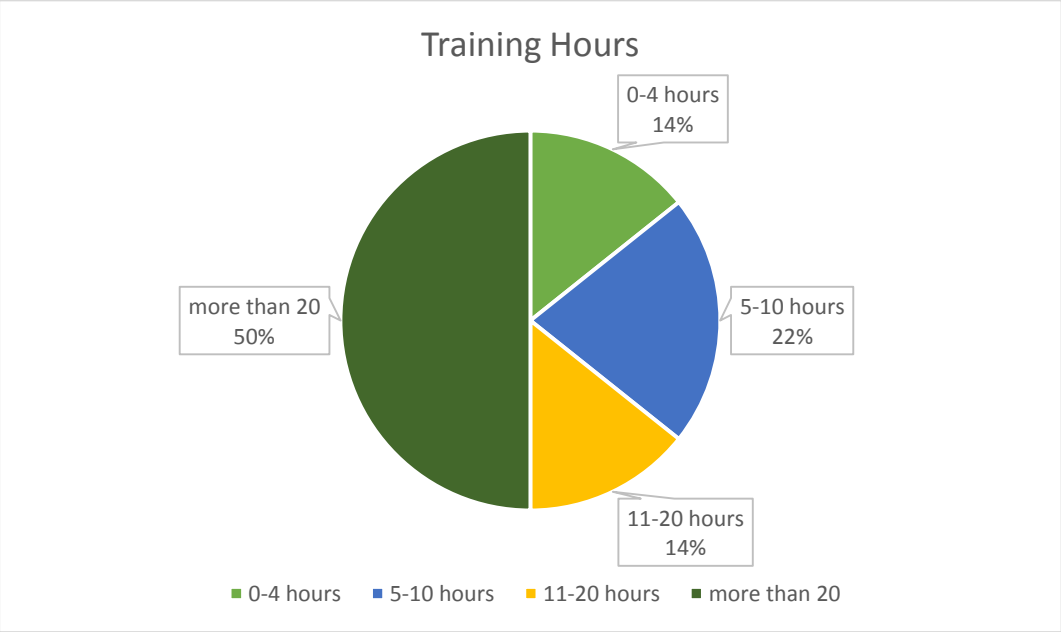

Figure 6: Training Hours

So while teachers reported a desire to learn and use new techniques with their students, again this was one area where the demographic survey did not provide an adequate representation of teacher's viewpoints. Participants surveyed said in-service training was provided regularly and was sufficient (71%), 78% reported staff development in technology was encouraged, and 100% agreed technology was important for student success. Yet, even those participants who reported actively using technology saw the process as a "learning curve."

Two of the schools (Focus Group A and Individual A) had an advantage of a volunteer available when needed and who provided one-on-one learning for teachers and students. Both of

the volunteers had technology backgrounds, knowledgeable on the different forms of technology equipment and software, were available whenever a teacher was in need of assistance, and was willing to provide one-on-one instructional assistance.

Teacher S001 stated,

> "So I have this wonderful volunteer, our media center/specialist, has semi-retired, he comes in once a week and takes a group of my kids, and he knows all kinds of stuff. So he has really been helpful and showed me how to do a lot of stuff. I would rather go (name)," would you show me how to" because it's that one-on-one, you know. I'm not sitting in an 8 hour class learning a whole bunch of stuff that I won't retain. I know how to do this, which was on my list today."

Teacher A004 stated,

> "There are many things offered, iPad training, Edline, SIM, Lexile. We are very lucky though, we have a technology volunteer that comes in and is very knowledgeable. She is always there to show us how to do whatever it is we need to learn. It is a one-on-one and then that teacher shares with someone else and so on."

Teacher A005 stated,

> "Many times across the district classes are offered, but we don't usually attend them. We are lucky to have a team that works with each other and a volunteer that will show us what we need to know."

In comparison the other two schools (Focus Group B and Individual B) did not have the same access to hands on learning by a volunteer or equivalent available upon request. The difference in the impact and attitudes showed in the responses on how trainings and professional development offerings were viewed. Teacher M002 when referring to the training opportunity provided by the county stated, "There was something on PAINT that the county does, but it's not

applicable to what we do. I sat there for a whole day and it was all about what my kids could not do. They jump from one program to another and another, oh my gosh. I had to go home, and pick just like one thing that I was going to learn about." When referring to learning how to integrate technology into instruction Teacher M003 added, "But I think it is something you have to seek out, and you're kind of on your own kind of thing, and on your own time."

In agreement with Teacher M003, Teacher M004 stated,

> "Right, my 6 years olds are not going to do the same stuff your telling me that your 10th graders are doing. And there's no time to practice it either, and there's no training there, they are just talking. You know it's just like with kids, if you do it you're going to remember it, if you just sit there and listen to it."

When asked what participants would rather see offered, many replied one-on-one instruction, specific to grade and student levels, trainings with plenty of practice time, and classes designed and offered on a need-to-know basis. Of significance, was the difference in the support systems, administration, specialist, and volunteers provided between the two schools. Teacher participation, involvement, and attitudes towards using technology for instruction showed positive responses when strong support systems were in place.

Support Systems

Over 80 percent of the participants agreed technology support was available and timely when needed (85%). However, participants from 2 of the 4 schools during the interviews and focus group sessions did not believe adequate support was provided through administration or from district or state agencies. One of the teachers reported her school's principal had only been hired that year (2014-2015). The teacher voiced her expectation that once the principal had time to adjust to her new job and settle in things would improve. When asked what technology

integration meant to leadership one teacher responded, “To leadership. To keep up with the “Jones’s” (laughing)….it’s decided by the county and it’s put upon us. And even though I know I use technology very well, to enhance my lessons and everything else. I can’t, I am not distinguished in it by any means, with my evaluation because these little 6 year olds are not producing a product with it. … And I feel that I do reach out, but it’s kind of like it doesn’t matter” (Teacher M006). All of the others (n=8) nodded their heads in agreement, or replied “right”, “exactly,”, “yes.”

In comparison, Focus Group A reported strong support from the principal, had a volunteer available on a 24/7 need basis, trainings and professional development classes were provided on site, and a” swimming team” had been developed for additional support. The “swimming team” was the name given to a group of teachers from the school and represented all grade levels. The group was created to become experts in technology use. They were also tasked with important decisions on the best way to implement technology and programs for the school as a whole. The team approach was successful and resulted in a buy-in by 95 percent of the staff to implement technology in classrooms and was accompanied by a positive stance on technology use which was apparent in the school culture.

From an administrative perspective, the principal at Focus group A’s school, explained, “…leadership is developed and encouraged which not only frees up time for the me but I understand what makes great leaders is to be surrounded by a group of people who are provided with the ability to make decisions and develop great leadership skills themselves. I work with other principals throughout the county and we share what we are doing at our school. Some still do not wish to share what they do with others, they hold on to it tightly, not sure why.” Although

time was seen by all participants as a major barrier, Focus Group A participants did not focus on the negative impacts time caused to successes.

The Media Center Specialist was seen by participants (16 responses) as an important support for planning, assistance of technology information, and how to use technology for lessons. As one teacher explained, "I can say this is what I'm teaching with the kids, or this is a program you can use, or whatever" (Teacher M008). The media center, in all of the schools, was reported to have computers and iPads where children participated in use during library visits, usually scheduled on a once a week basis.

All participants' responded (28 responses) that their main support systems came through collaboration with other teachers. Other teachers provided help, ideas, and assurances technology could be used successfully for instructional purposes. One teacher stated, "…it's collaboration. I learn how to do something and then we teach somebody else" (Teacher M003).

Teacher M002 stated,

> "Our school does instructional rounds. And this year I choose technology, because I wanted to stretch myself, and try to get myself to do a little bit more iPads. So I was able to go to another classroom and watch how that teacher incorporated the iPads and technology into the reading block time. And then I went, I can do that, I can use that in my classroom. So that's good, I decided to use some of the apps I saw. I wouldn't just look."

Teacher M006 replied,

> "Or I go, can I come in and watch you, it's a very open staff to share. Word of mouth, one teacher uses something and then tells someone else, and each learn from one another."

Time

Findings from the current study revealed time was a barrier that impacted all other categories. For some of the participants (Focus Group B and Individual B), they were unable to see beyond the challenges time presented. When responding to the survey question, Technology integration is too time consuming for me to use it, 93% disagreed to strongly disagree. However, once again when conducting the interview sessions time for planning purposes was not only seen as a major challenge to successful integration (33 responses), but participants believed technology integration had a negative impact on student learning (15 responses). Implementing technology was problematic when it came to the time to instruct student on how to utilize programs. This was seen as time taken away from other foundational goals.

As Teacher M007 explained,

> "I'm a kindergarten teacher, they do pick it up so much faster. And they know it when they get older, so is it really worth me taking away that time when we are developing language and those foundational skills to teach them how to do something that might take me a month for them to learn. When they get into 3rd grade they learn it like (snapping) that. But we're expected to do it. We are always having to figure out what to give up"

Teacher M005 continued,

> "Which is why I told you about that question on there (questionnaire) why I couldn't say about time, because it's not that I agree or disagree. There' isn't time to do it…like she loves to go home and look at that stuff (speaking about researching and finding apps for

student use). I don't. I go home and I want to veg out to Judge Judy and I want to put my feet up and play with my cats, and talk to my son"

Teacher M003 added,

> "It does kind of rob from lesson planning. Good lesson planning. So when you're sitting down and doing your lessons, (*Laughing*) that's not even close to being on my radar."

Another Teacher M001 continued,

> "On our Sunday afternoons, and the 5 typed pages of our lesson planning. It's impossible when you are teaching during the day. Our planning time during the day is getting other things done, that have to get done at that moment. You have to type something up to send it home with that child, or you know that moment or that day that must go home with the kid. Answering the emails, or calling the parent, how are they getting home. I can't just get basic curriculum stuff done in the REAL hours, I'm working 10-11 hours just taking care of those needs."

An example of how time was seen as barrier to learning, one of the teachers explained how she used digital story book to create a project with her first grade class. The class really enjoyed creating together; however she had to give up her reading group time for a week and a half. Investing the time was worth it she said, but the ability to do one every month was not an option. She stated, "…that was a sacrifice I was willing to make for a week and a half, but I thought to myself I can't do this every month. I can't give up a week and a half of reading groups every month for these kids to make this digital story" (Teacher M001).

Equipment/Infrastructure

Time was also a factor when it came to the use of equipment and infrastructure. Sixty-four percent of respondents reported adequate technology resources were available, and 93% stated instructional software programs were adequate. Through observation and conversations the researcher found each classroom was supplied with at least 1 iPad and some teachers had access up to 20 iPads from the media center. Personal computers in the classrooms ranged from having 1-5, however some participants reported inadequate processing time and failing equipment, which was not being replaced due to lack of funding. Funding was also reported as a major barrier to a lack of apps and software for classroom use. One teacher stated, "I think of the creations that I tried to do and we were trying to do the audio so they could, they were sequencing planting. And they would talk and then you couldn't hear it. So, you know how little kids are, but there wasn't like "let's do this over". You had to start the whole thing all over. That's the kind of stuff we wasted like 3 days trying to figure that out. And I finally went this is not working. So let's go back to printing all the pictures" (Teacher M003).

The iPad was used most consistently by all grade levels. Participants reported challenges such as glitches with internet access, disappearance or crashes of apps, and time (39 responses) when finding new applications for instruction or learning how to use programs before introducing them to students. One teacher stated, "It's not really designed for young children (speaking of the iPad) because young children, they don't know how loud to talk. So you should be able to delete it and then try again, but that wasn't an option. So I went, what!" (Teacher M002).

Funding

Funding, or the lack thereof, was discussed the least (16 responses) and was in relation to the equipment and app purchases. One teacher reported, "I don't want to buy one of these things that doesn't work. I'll just use what someone else, or so and so is using next door. I mean it works for her so…great" (Teacher M005).

Other Concerns

Questionnaire Section A ended with the following open-ended question: "What do you see as unmet needs that hamper your effectiveness to use technology for instructional purposes?" Responses consisted of materials (10%) as the least reported barriers, 25% reported professional development, 35% reported equipment (or lack thereof) and 46 % reported other which consisted of (1 response) lack of knowledge of technical personnel, and 5 of the 6 participants stated time was the greatest barrier. The following are some of the remarks made: time to learn, time to explore apps, and time to fit everything into the daily routine.

Summary

Analysis of the data from demographic survey questions and in-depth interviews revealed teachers define technology integration in a number of ways. Some participants reported technology was an extension of student learning; a tool to determine each child's learning needs; a way to connect parents to their students learning, as well as, a student's ability to collaborate with classmates and others in the world.

A comparison of information gathered from the survey and the interview sessions provided a deeper understanding of teacher's viewpoints. Many barriers, central to the current participants, was supported in previously conducted studies and outlined in the literature. Time

was found to be one of the major challenges to all teachers. Without sufficient support and training time became an even larger barrier for successful technology implementation.

Results from the current study also showed a marked difference in a number of areas where the survey alone was not an accurate portrayal of the thoughts and viewpoints of the participants. Supported by earlier studies, some research suggested general surveys by teachers did not provide an adequate, in- depth picture as to why integration had not been applied in sufficient ways, as well as barriers encountered not sufficiently addressed (Judson, 2006; Bauer& Kenton, 2005). The ability, through the current study, to hear the voices of teachers through in-depth conversations illuminated a far more accurate portrayal of the barriers teachers face when trying to implement technology for instructional purposes.

Chapter 5 will present a discussion of the current findings, recommendations, and suggestions for further research.

CHAPTER FIVE: SUMMARY

Introduction

A review of the related and relevant literature revealed teachers underutilize technology for instruction. Additionally, the review found, as reported by Bauer and Kenton (2005) and Judson (2006) most studies had looked at teacher utilization of technology through surveys as the primary form of gathering data. Given the messages from teachers had not been fully revealed, the current study was designed to provide a more comprehensive means through which the voices of the teachers could be included in the on-going discussion about the integration of technology into instruction. Therefore, the data collection methods for the current study consisted of face-to-face, in-depth individual interviews, focus-groups interviews and a demographic questionnaire for comparison purposes. The focus was to have teachers from Brevard County, define the meaning of technology integration and describe barriers they identified that hamper the execution of technology for instructional purposes (Bauer & Kenton, 2005).

Conclusion

Barriers and Challenges Identified

The current study discovered teachers in Brevard County described a much bigger picture when it came to the underutilitzation and challenges they faced when implementing technology into instruction. Teachers expressed lack of funding, specific training and professional development needs, sometimes insufficent support systems, lack of up-to-date equiptment, and time were all challenges and barriers faced when introducing technology for student learning. Hixon and Buckenmeyer (2009) suggested technology had made little impact on education in

comparison to other industries, businesses, the medical field and entertainment. But by comparision, these fields are not working with and using technology to instruct children as young as 5 how to apply and learn with sometimes unfamiliar equipment and complicated and multiple step proceses. Businesses and other industries are also not bound by the barriers faced by educators of young children. Because of this, the comparision of education to other industries are inappropriate.

Professional Development and Training

A major issue in technology implementation is, without adequate professional training for teachers technology use for instructional purposes would be ineffective (Froese-Germain, Riel, & McGahey, 2013). The current study revealed that although Brevard County provided professional development and training options, the participants found them ineffective and inadequate for meeting their specific needs. Effective learning takes place, according to Roschelle, et al., (2000) when four characteristics are present: 1) engagement; 2) participation in groups; 3) frequent interaction and feedback; and 4) connections made to real world contexts. Not only do students learn better when these conditions are in place, so do teachers.

Some of the participants in the current study were not given the opportunity to make training choices for personal goals, were not provided ample practice time during and after trainings, or provided with hands-on, learning-centered instruction. As revealed in a study by Anthony (2011), teachers who were provided with greater ownership, specific goals, and time allotted to plan, share, and collaborate increased motivation and implementation of technology. The teachers in the current study overwhelmingly reflected these same attributes when discussing the most appropriate and sought after trainings and professional develop classes desired.

Beliefs and Attitudes Towards Technology Implementation

One of the main components in implementation lies in the belief system of educators, administrative support and leadership (Mouza, 2005; Rideout, 2012; Ringstaff & Kelly, 2002; Rochelle, et al., 2000). Teachers in Focus Group A were given a choice in training opportunities, take part in the decision making process for themselves and their school, and were provided with ample support systems by the principal, as well as a technology volunteer. Group A teachers believed technology could transform their instructional practices and positively effect student learning, which was evident in the school culture. By comparison, Focus Group B teachers were not contributing members in the decision making process for themselves or the school. Group B teachers conveyed feelings of being unsupported and unacknowledged in their efforts and struggles when trying to implement technology for instruction and overwhelmed in having one more thing added to their already full load. These feelings generated a negative approach by the teachers when it came to technology integration. Although, both groups viewed technology as a positive addition, capable of impacting students in positive ways, the perceived learning challenges for Focus Group B teachers was seen as too time consuming and too overwhelming for successful integration to be realized. Some also reflected on the other learning objectives that would falter because of the added requirement. One teacher stated, "…and for myself personally, I don't feel like I'm doing any of it well. Not as I would like to" (Teacher M004).

Time

A barrier to effective technology integration into instruction was identified by all participants in the current study was time; that is, time required for training for themselves, for redesigning instruction, and appropriately preparing students in the use of technology. Some, as in Focus Group A, did not view it as insurmountable because of the support systems put in place

by the principal. On-site trainings, development of leaders, and additional time set aside for collaboration provided positive impacts to time limitations. Literature supports similar positive outcomes when these conditions were addressed (see, Anthony, 2011; Ertmer, 2005; Liehucki, 2013). The findings from the current study discovered when students were allowed to teach and mentor other students and conduct some of the research on programs and information which would normally fall to teachers, time restraints were positively impacted. A study by Anthony (2011) found similar results.

Even with some of the negative beliefs upsupportive of technology integration held by participants, findings from the current study revealed teachers were not against the use of technology for instruction, quite the opposite, all participating teachers understood the importance of technology for student learning and the positive impacts it could provide. One teacher described using technology in her classroom so that students would have additional options to acquire hard to understand concepts, "I think about planning multiple experiences with it that will target as many different and invidual kind of learners as I can" (Teacher S001). Mouza's (2005) study adds support finding technology could add to a child's cognitive development through creating enviroments where children learn by doing, use tools to visualize hard-to-understand concepts, and reinforce developmentally appropriate practices.

Some of the participants reported utilizing math games for drill and practice to provide added support for student learning. Others reported using technology for collabortation in project creation and paired experienced students with novice students to help them gain technology proficiency and increase social interactions. These examples not only provided assistance and allocated time for teachers to work with individual students, but the experienced students gained self-confidence in the process. The literature supported similar findings and suggested while drill

and practice was shown to be ineffective methods for instruction, utilizing techology to gain expertise could make the method beneficial. Social interactions were also shown to enhance novices working with more experienced students, collaborating on projects, and choosing open-ended games and software (Johnson & Christie, 2009; Li & Atkins, 2004).

Equipment, Infrastructure and Funding Issues

When it came to equipment, most of the teachers reported one iPad for each class, although up to 20 could be checked out through the media center for use when needed. However, those 20 were the support system for the entire school. Hew and Brush (2007) suggested the lack of access played an important part in the use of technology. The computer lab in one school, once fully staffed, is now utilized by classroom teachers without assistance because of funding. At the time the data was collected for the current study, time slots were assigned on a 30-minute basis once a week for each classroom. Time, therefore became problematic in whether or not the appointed time conflicted with other classroom needs. In addition, all the teachers reported computer labs were unavailable for use during the last four months of the school year due to preparation and testing for the Common Core Assessments. Another teacher related the computer room had been available until this year, but was now being used for 6th grade students only. Science had been substituted for all other grade levels.

Some teachers from Focus Group B explained computers in classrooms were no longer being repaired or replaced when breakdowns occurred due to funding issues. The result was teachers were not always provided working equipment and certainly not equipment that was up-to-date which, in turn, mean they had to as Teacher M003 put it, “make do with what they had.” Mandating the use of technology by policy makers is not sufficient. Without clear guidelines for

needed upgrades, replacements and funding in place for utilization, success cannot be expected or obtained (Khalid, et al., 2015; Milman, et al., 2014).

The infrastructure, affecting equipment failures and glitches, caused disruption to learning and were challenges reported by all the participants. Many teachers cited app crashes, lack of internet access, and funding issues resulting in lack of up-to-date equipment. Technical support; timely, on-site support; financial planning to cover additional expenses such as upgrades for software, replacement of obsolete devices (a very real problem); and maintenance issues are not clearly identified or provided for by policy initiatives set forth (Froese-Germain, et al., 2013; Mouza, 2005).

Hiltzik in his article titled*, Who really benefits from putting high-tech gadgets in the classrooms?* (February 4, 2012), made some interesting points. He argued placing computers within the classroom does not automatically insure teachers will utilize them, students will benefit from them, or the educational setting will be transformed because of them. The push for technology use, he argued, is solely driven by commercialism and was not based on the pedagogical or theoretical considerations on ways learning takes place. He went on to question statements proposed by policymakers that all children should be provided with technology (computer or iPad) without a clear way in which this will be paid for considering our already economically failing system. Findings from the current study, primarily from my extensive conversations with the participating elementary teachers, would lend support to Hiltzik's (2012) comments. Additionally, there is the on-going costs associated with keeping equipment repaired and up-to-date and the ongoing costs associated with training that must be a regular part of the technology integration process.

Effective Uses of Technology for Instruction

In the present study teachers reported technology had positive impacts for home to school communication. According to multiple sources (Froese-Germain, et al., 2013; Li & Atkins, 2004; Ramos, James, & Bear-Lehman, 2005; Ringstaff & Kelly, 2002; Wartella, Caplovitz, & Lee, 2004) the lack of equipment allowing students to participate equally in projects, and the unequal availability of technology among lower income students was found to be problematic. However, in the current study, teachers reported technology not only enabled teachers to keep parents informed about their child's learning, but was believed to breakdown some of the issue's related to lower income student access and participation. Many of the teacher's created blogs, constructed classroom websites and newsletters, used Edmodo (www.edmodo.com), a free communication site for students and teachers to connect so students could collaborate with schools in other countries, and other creative ways to share and learn. Although not scientifically based, these examples provided a way for teachers, as well as parents, to keep abreast of information using technology through new and innovative ideas.

Even with the positive outcomes, the above mentioned uses of technology application do not met the requirements for student use mandated by policy makers and administrators and for teacher evaluation purposes. As one teacher explained, "Even though I know I use technology very well, to enhance my lessons and everything else. I can't, I am not distinguished in it by any means, with my evaluation because these little 6 year olds are not producing a product with it" (Teacher M006). The lack of acknowledgment for her effort produced discouragement which was visibly and verbally apparent.

Recommendations

Implications

Studies suggested general surveys by teachers do not provide an adequate, in-depth picture as to why technology has not been successfully integrated into instruction (Judson, 2006; Bauer & Kenton, 2005). One of the major findings from the current study adds further support to the literature by the choice of data collection methods utilized. The use of face-to-face, in-depth individual interviews, focus groups, demographic questionnaires, and observations produced a deeper understanding and clarification of the meaning of and barriers encountered when teachers sought to integrating technology into instruction. The ability, through the current study, to hear the voices of teachers through in-depth conversations illuminated a far more accurate portrayal of the barriers teachers face when trying to implement technology for instructional purposes. The new insights, discovered through the present study, could be helpful to administration and policymakers as new policies and mandates are developed.

With more usable information it is possible programs and support needed for successful technology integration by teachers could be redesign to produce better trainings and professional development classes. Findings from the current study suggested the inability to apply learning gained from the current trainings and professional development, negated learning. Participants reported trainings was void of specificity, was not learning-centered, and did not provide participatory learning experiences desired by teachers. The current study along with supporting studies suggests, given the costs involved, more effective training should be developed and offered to teachers. As in the Gulbahar (2007) study recommended; planning should precede purchase and training precede implementation. Muller, et al. (2008) suggested effective design should include high engagement, learning-centered, be individual focused so participants could

actively engage in the process. Training and professional development classes should not be designed as "one-size-fit-all" instruction (Anthony, 2011). Further support could be developed by Brevard County through building coalitions with businesses and industries willing to provide volunteers to support teacher's technology use. Such partnerships could not only be beneficial to teachers, but could possibly aid in offsetting funding issues.

Further Research

Focus Group A had a principal fully dedicated to the success of not only her students but her staff as well. Sadly for her staff, she retired at the end of the 2014-15 school year. I had to wonder what impact a new administrator, without possibly having the same dedication and outlook towards technology use, would have on the school culture. The ability to follow-up with staff and teachers could add additional insight to the potential impact a change in administration could have on teachers' implementation of technology for instruction. Some studies suggested implementation was dependent upon the support, or lack thereof, provided by administration (Hew & Brush, 2007). One study found principals trained on iPad use resulted in administrator's ability to utilize them for administrative tasks and resulted in positive views for iPad use by classroom teachers (Dogan & Almus, 2014).

Project Tomorrow, Speak Up for Aspiring Teachers survey (2013) found 61% of pre-service teachers were smart phone users, social media users, connecting with friends and social network sites. The study suggested when it came to preparing them to use technology in their future classrooms they were unprepared. The majority of the pre-service teachers still leaned toward traditional methods as the preferred way of learning and had little knowledge of how to use tools. They also needed to be provided with models and plenty of practice time with real world scenarios. Today's principals, according to the study, were searching for teachers who

could integrate technology for student learning through authentic learning experiences (75%), and differentially instruction (68%). The researchers believed having social media tools and knowledge would not produce the high expectations sought for by administration (Speak Up, 2013). Rethinking how new teachers are prepared for the demands and expectations should continue to be a focus of research.

Final Thoughts

Technology and media have been plagued with contrasting opinions as to its usefulness in the educational setting. Positive effects on learning technology could provide are: a) the flexibility of learners to determine the pace at which they learn; b) insure learners are provided with immediate feedback; c) have ability to "interact" with materials; d) utilize drill and practice of learning skills; e) increase motivation for some learners; and f) the ability to retain a child's attention (Chera & Wood, 2003). Critics argued there was limited proof of effectiveness when it came to technology use, and it is not technology that is of importance, but the way in which it is utilized. The foundation of the argument rests on how children learn and what the integration of technology by teachers could add to the learning environment.

While there are many ways to implement technology for student learning teachers are the ultimate guardians. Teacher beliefs have a strong influence on instructional practice and curricular development. Policy makers are under the assumption that implementation of mandated decisions will be sufficient in the execution of technology for instruction, but research shows unless alignment of policies coincide with teachers' beliefs' or practice, the initiatives usually fail (Niederhauser & Stoddart, 2001). The need for clear guidelines as to how to incorporate technology for instruction and learning directives for which it would be utilized, is necessary. Integration of technology into the education system is not an easy process. Many

barriers and challenges are uncovered in literature, along with a silence of the very voices of those who work on the frontlines and are often blamed for the lack of utilization (Hixon & Buckenmeyer, 2009). Providing a platform for those voices was the main purpose for the current study.

With policies mandating the use of technology in the educational setting, " It is no longer a question of whether or not computers will be used with young children, but rather how they can most effectively be used" (McCollister, Burts, Wright, & Hildreth, 2001, p. 121). Accepted by policy makers, educators, and parents, technology has become a new instrument in the education of our children. The question remains will it result in the same benefits and will we listen to those who have the task of teaching our youngest of learners. Teachers not only need assurance technology would improve learning for students, but must be provided with the tools and support to remove barriers and challenges they face for successful implementation. The voices recognized through the current study and supported by the literature is unmistakable, "…technology can be a wonderful tool for students to learn, create, understand, and explore, but it can only do so in the hands of skilled teachers" (Mouza, 2005, p. 527).

I asked one parting question to a group of teachers, "Why do you do what you do with all of the demands and challenges you face today?" Being a teacher and part of the education field for over 30 years, however I already knew the answer: "We love the children."

APPENDIX A: IRB APPROVAL

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Cynthia D Spainhour**

Date: **March 20, 2015**

Dear Researcher:

On 03/20/2015, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	The Integration of Technology into Instruction by Elementary Teachers in Brevard County, Florida: An Investigative Study
Investigator:	Cynthia D Spainhour, ALIMA
IRB Number:	SBE-15-11118
Funding Agency:	
Grant Title:	
Research ID:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Joanne Muratori

Signature applied by Joanne Muratori on 03/20/2015 10:55:54 AM EDT

IRB Coordinator

APPENDIX B: BREVARD COUNTY APPROVAL

School Board of Brevard County
2700 Judge Fran Jamieson Way Viera, FL 32940-6699
Dr. Brian Binggeli, Superintendent

School Board

February 5, 2015

Dear Cynthia Spainhour,

Thank you for your application to conduct research in the Brevard Public Schools. This letter is official verification that your application has been accepted and approved through the Office of Accountability, Testing, & Evaluation. However, approval from this office does not obligate the principal of the schools you have selected to participate in the proposed research. Please contact the principals of the impacted schools in order to obtain their approval before you contact the teachers you want to participate. You must have the principal's approval. Upon the completion of your research, submit your findings to our office. If we can be of further assistance, do not hesitate to contact our office.

Sincerely,

Janet L. Stephenson

Janet L. Stephenson, Resource Teacher
Office of Accountability, Testing, and Evaluation

Office of Accountability, Testing & Evaluation
Phone: (321) 633-1000 FAX: (321) 633-3465

APPENDIX C: EXAMPLE OF SCHOOL REQUEST LETTER

Dear[Recipient Name]:

I am a graduate student at the University of Central Florida in the Applied Learning and Instruction program (ALIMA) and am working on my Master's Thesis project. I have chosen to research how elementary teachers within selected schools in Brevard County integrate technology for instructional purposes. I'm using the information I gather as part of my thesis project in hopes of identifying the strategies and challenges faced by teachers, providing teachers a voice within the current literature, and develop recommendations for other teachers as they strive to integrate technology in their own classrooms.

I have acquired permission for the study from the District and was instructed to contact potential schools for additional permission. Because (Name) Elementary was awarded the ATTAIN Award in (date) I believe that your school would be an excellent source of information and of great value in informing my research from a practical perspective. Your teacher's insights, experiences, and opinions regarding elementary school instruction using technology would provide valuable information as part of my thesis project.

I recognize the value and importance of your teacher's time, and because of this the requirement of their time will be minimal. An interview and descriptive observation of selected teacher(s) would take approximately 30 minutes, and/or a focus group session made of 4-5 teachers which would also take approximately 30 minutes. As a token of their participation I will provide a Starbucks gift card for the teacher(s) who chooses to partake in the individual interview and coffee and donuts to those who participate in the focus group session. Questions will cover: purposes for computer use; types of software programs used for instruction; attitude towards technology integration; and the impact on student learning and classroom management. With your permission I would like to send a short email to teachers from your school to see if there is

anyone who might be interested in participating. My hope is that one or more of your teachers would be able to find 30 minutes to meet with me before the end of March, as I would like to have all research data completed at that point. Results from my study will be available to all participants and/or administration by requesting results through me via email.

If you have any questions, please feel free to contact me by phone at 321-690-0157 or by email at spainhourc@knights.ucf.edu. My guide and faculty advisor for this project is Dr. Kay Allen, from the Education Department at UCF and can be contacted at KayAllen@UCF.edu . I appreciate your time in considering my request.

Sincerely,

Cynthia Spainhour

APPENDIX D: QUESTIONNAIRES

Appendix D: Demographic Questionnaire

Demographic Questionnaire **Number: _____**

The following are demographic questions and are intended for general collective purposes and will in no way identify any individual. Your responses are completely voluntary and you are free to skip any questions you are not comfortable in answering.

1. What is your age?
   21-30 31-40 41-50 50-up
2. How many years have you been teaching?
   1-5 6-10 11-15 16-20 21 or more
3. What is the degree of your overall knowledge of current technology?

   Experienced Intermediate Novice Non-user

4. How often do your students use technology during instruction?
   Daily Weekly Monthly Rarely Never
5. How would you rate your level of technology integration into instruction?
   Daily Weekly Monthly Rarely Never
6. How many hours of technology training have you received?
   0-4 5-10 11-20 More than 20
7. In what ways have you learned how to use technology?
   Independently Professional development Colleagues Students
8. What do you see as unmet needs that hamper your effectiveness to use technology for instructional purposes?

   Professional development Equipment Materials Other(s) please describe:

Please respond to the following questions by selecting one of the five responses (5=strongly agree; 4=agree; 3=disagree; 2=strongly disagree; 1=unsure)

	5	4	3	2	1
9. I am comfortable using technology					
10. In-service training is provided regularly and is sufficient					
11. Adequate technology resources are available					
12. Staff development in technology is encouraged					
13. In my school technology is not important					
14. My school lacks instructional software/programs					
15. Technical support is available when needed and timely					
16. Integrating technology is not pertinent to my curriculum					
17. Technology integration is too time consuming for me to use it					
18. Technology integration is important for student success					
19. I plan and teach student-centered learning activities and lessons in which student apply technology tools and resources					

Appendix D: Focus Group Interview Questionnaire

Focus Group Interview Questionnaire **Number: _____**

First I would like to thank you for your willingness to speak with me. I would like to talk with you today about the use of technology integration in elementary classrooms, how you plan and use technology for instructional purposes, and it can be used to support student learning. Anything you say will be kept confidential and I will not identify anyone individually. I would also ask that everyone respect the rights of others in our group by not sharing information about others outside of our group session as well. I will be recording our conversation to insure that I transcribe our conversation correctly, is there anyone that would prefer not to be recorded? (i.e., with the understanding that you will then be asked not to participate in the study). Does anyone have any questions you would like to ask me at this time?

1) Do you believe technology positively or negatively influences student learning? Describe.
2) What does integration mean to you? What do you believe it means to leadership?
3) How do you select technology and digital resources to meet learning goals for your students?
4) Are there support structures administration has put into place to support teachers using technology?
5) What type(s) of professional development classes are offered for technology integration?
    a. Have you taken any? If so how many?
    b. What was the content?
    c. How would you change them?
    d. What would you rather see offered?
6) What technologies are used or supported? For what duration and frequency are they used? (Type of use: drill and practice, productivity, internet, communication, problem-solving, or others)
7) Do you see technology being used to increase basic skills and knowledge or as a resource to help students develop higher order thinking skills? How?
8) What do you think are the benefits and challenges of using technology? List any words or thoughts.
9) How much time is devoted to technology integration? Is time a factor in not utilizing technology more for instructional purposes?
10) To what extent does teacher collaboration exist or play in technology use?
11) How would you rate the effectiveness of technology at your school?

Appendix D: Individual Interview Questionnaire

Interview Questions **Number:**

I would like to talk to you by asking the following questions. They are intended to show the show the strategies/steps used in elementary classrooms to integrate technology and the level of integration currently being employed. Anything you say will be kept strictly confidential. I will assign an identifier number to you at the beginning of this interview known only to myself. Do you have any questions you would like to ask me before we begin? I will be recording our conversation to insure that I transcribe our conversation correctly, do you have any objection to this? I will provide you with a transcribed written copy for verification and assurance by email. You will need to verify the information is correct by replying to the email within (1) week. Is this okay with you?

1. What does technology integration mean to you? Define.
2. Do you currently use technology in the classroom for instructional purposes? Describe. If not why?
3. What steps or strategies do you follow when you set out to create lesson plans which include technology as a part of the instruction?
4. How do you select technology to meet your students' learning goals?
5. How do you perceive your role as a teacher to integrate technology? Teacher-directed or, student-directed?
6. What professional development resources do you prefer for guidance regarding technology use? Or do you have any, do you have professional development classes?
7. What frustrations do you believe turn teachers and or students away from using technology? How have you overcome them?
8. Describe the classroom management technique(s) you use when utilizing technology?
9. What strategies do you recommend for teachers who want to integrate technology into their teaching?
10. Has technology changed the way you teach? How?
11. Do you believe it has added to the way in which your students learn? Describe.
12. What is the number one factor that prevents you from integrating technology into your lessons?
13. Describe your belief system on how children learn? (Teacher-centered, student –centered)
14. Describe some of the activities in which you employ technology use for instruction. (Drill & practice; Word processing; creating instructional materials; solve problems and analyze data; record keeping and grade book; lesson plans; communication with students/parents; presentations)
15. What professional educational technology assistance would best meet your needs and goals for your students?

Appendix D: Observation Form

1. For what purpose is the instructor using technology?

2. What part does the computer activity play in the overall lesson?

3. How many children are engaged in working at the computer(s)?

4. How does the teacher manage the various activities going on? (classroom management skills)

5. What kinds of computer activities are the students doing?

6. What kind of teacher-student technology interactions are demonstrated?

7. What computer hardware is available in the classroom?

8. What software is being used?

9. How are the computers situated in the classroom? (Does the arrangement give the students a sense of being useful?)

10. Document(s) descriptions:
Observation Form Number: _____

APPENDIX E: PARTICIPANT CONSENT FORM

The Integration of Technology into Instruction by Elementary Teachers in Brevard County, Florida: An Investigative Study

Informed Consent

Principal Investigator(s): ALIMA	Cynthia Spainhour, Student at University of Central Florida, Master's Program
Faculty Supervisor:	Dr. Kay Allen, University of Central Florida
Investigational Site(s):	University of Central Florida, Department of Education

Introduction:

Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part because you are an Elementary Educational Instructor. You must be 18 years of age or older to be included in the research study.

The person doing this research is Cynthia Spainhour, a graduate student at the University of Central Florida enrolled in the Applied Learning and Instruction Master's program (ALIMA).Because the researcher is a graduate student she is being guided by Dr. Kay Allen, a UCF faculty supervisor in The Educational Department.

What you should know about a research study:

- Someone will explain this research study to you.
- A research study is something you volunteer for.
- Whether or not you take part is up to you.
- You should take part in this study only because you want to.
- You can choose not to take part in the research study.
- You can agree to take part now and later change your mind.
- Whatever you decide it will not be held against you.
- Feel free to ask all the questions you want before you decide.

Purpose of the research study: This investigative/descriptive study is to determine how and in what ways are the elementary teachers in Brevard County, Florida integrating specific

technology into the instructional process. This proposed research initiative will attempt to answer the question: Are there specific strategies currently utilized by elementary teachers in Brevard County that can be used as potential models for technology integration for student learning?

This research will attempt to provide a continuation of current conversation, fill gaps identified within the current literature, add the voice of educators to the conversational dialogue, and spur new questions as technology continues to find its way into the field of education.

What you will be asked to do in the study:

- The participants will interact only with the researcher through individual interviews and/or focus groups and possible descriptive observations of selective teachers.
- The research completion date is set for July 2015.
- Participants will be asked to complete an (8) eight item demographic questionnaire for general collective purposes and take part in an individual interview and/or a focus group session.
- The individual interview is based on (15) fifteen open-ended questions on the use of technology in elementary classrooms for instruction and learning initiatives. Interviews will be recorded for accuracy. The participant will be provided with a transcript for clarification and assurance that the conversation has been transcribed correctly. Purposeful data will be collected through descriptive observations of selected teacher(s)
- The focus group interview is based on (11) eleven open-ended questions on the use of technology in elementary classrooms for teaching and learning initiatives. The conversation will be recorded for accuracy and as a backup for the researcher notes.
- There will be (1) one scheduled session for *each* which will require approximately 30 minutes of the participants time. From this selection a participant will be chosen for purposeful data collection through descriptive observation(s) and/or document review. The researcher may make observations through class instruction and/or documents to identify strategies utilized and barriers faced by the teacher, as well as skills and guidelines utilized to effectively implement technology for student learning. This session will take place at the teacher's convenience and allowable time constraints. This will require approximately 1-2 hours of observation and/or purposeful data collection and review.

Location: The researcher will meet the participant(s) at their school location at the convenience of the participant(s) for both the interview and focus group sessions.

Time required: We expect that you will be in this research study for (1) one session which will take approximately 30 minutes, taking place before or after class time. A follow up email will be sent for verification of the transcription of the conversation by each individual session. The focus group will meet for one session, for approximately 30 minutes, and take place before or after class time. It will take approximately 1-2 hours for observation and/or purposeful data collection and review.

Audio or video taping:
You will be audio taped during this study. If you do not want to be audio taped, you will <*not*> be able to be in the study. Please discuss this with the researcher. If you are audio taped, the tape will be kept in a locked, safe place. The tape will be erased or destroyed when the information is transcribed and verified by you the participant.

Risks: There are no reasonably foreseeable risks or discomforts involved in taking part in this study.

Benefits: We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include information about technology integration shared by others during the focus group participation.

Compensation: There will be coffee and donuts offered as refreshments for the focus group session. If you take part in the individual interview, you will receive compensation for your time with a $5.00 gift card for Starbucks.

Confidentiality: We will not share your personal data collected in this study, coding will be done by the researcher, which only she will have access to, and all identifiers will be removed from the study. We cannot promise complete secrecy during the focus group session, but will recommend to the participants to not share identifiers with anyone outside of the group.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt you, you may speak with Cynthia Spainhour, Graduate Student, (321) 693-2344 or Dr.Kay Allen Faculty Supervisor, Department of Education at (407) 823-2233 or by email at KayAllen@ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research &

Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL32826-3246 or by telephone at (407) 823-2901. You may also talk to them for any of the following:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You want to get information or provide input about this research.

Results of the research: Results of the study may be obtained by contacting Cynthia Spainhour by email at spainhourc@knights.ucf.edu

APPENDIX F: ISTE STANDARDS

ISTE Standards

International Society for Technology in Education

ISTE Standards Teachers

Effective teachers model and apply the ISTE Standards for Students (Standards•S) as they design, implement, and assess learning experiences to engage students and improve learning; enrich professional practice; and provide positive models for students, colleagues, and the community. All teachers should meet the following standards and performance indicators.

1. Facilitate and inspire student learning and creativity

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

a. Promote, support, and model creative and innovative thinking and inventiveness

b. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources

c. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes

d. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments

2. Design and develop digital age learning experiences and assessments

Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the Standards•S.

a. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity

b. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress

c. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources

d. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards, and use resulting data to inform learning and teaching

3. Model digital age work and learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

a. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations

b. Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation

c. Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats

d. Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning

4. Promote and model digital citizenship and responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

a. Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources

b. Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources

c. Promote and model digital etiquette and responsible social interactions related to the use of technology and information

d. Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools

5. Engage in professional growth and leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

a. Participate in local and global learning communities to explore creative applications of technology to improve student learning

b. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others

c. Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning

d. Contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community

Connected learning.**Connected world.**™

iste.org/standards

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