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Technology In The Classroom

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Technology in the Kindergarten Classroom

by

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Abstract

The purpose of this study was to discover how I, a kindergarten teacher, used technology within the classroom. The authors of the articles and case studies in the literature review discuss the various technological tools available in school districts and how teachers utilize them effectively. This was a qualitative, self-study where I looked at my practices concerning technology in the classroom. The data were collected during a six-week period using journaling, factual information, and lesson plans. The results of the study showed that I used 10 different forms of technology in the classroom during lessons created. Results also showed the deficiencies in the amount of training of technological devices there were in the Appleton Central School District (pseudonym). This study opened the possibilities into the world of technology and how it can effectively be used in the classroom. In an interconnected world it is important for students to have more access to information about the world. Technology provides that opportunity for students. The real strength of technology in the classroom is differentiation. They have a greater pool of knowledge but also have an ability to interact with the knowledge unique to their learning styles.

Chapter 1- Introduction

It's math time in my kindergarten classroom. "Alright friends, I'm going to be looking for students who are working quietly and being respectful to come up to the SMARTboard to help me." Instantly, nineteen hands are in the air. Every student is hoping his or her name is called. The SMARTboard is an exciting piece of technology for the classroom. Everyone wants to be able to come help. As I walk around the classroom, I look for students who meet my behavior specifications to be able to come to the board. All nineteen students are working hard on their math practice pages. The motivation that the SMARTboard creates is impressive. A technological tool is more motivating than just completing the work with pencil and paper. Once the students are finished, I call upon Avery (all names are pseudonyms) to help on the board. All the other students are glad for Avery, but wish they were called. Like always, I reassure my students there are plenty of opportunities to be able to use technology in our classroom throughout the day and school year.

Problem Statement

Administrators in school systems are advocating for the Common Core State Standards (CCSS) to be implemented fully. Because the CCSS has been enacted, educators are striving for all students to be college-and career-ready by the time they graduate from high school (Common Core State Standards Initiative, 2014; NYSED, 2011). A part of being college and career ready is also having twenty-first century skills, specifically those that include technology. Students need to have opportunities to use technology in order for these skills to develop and thrive. Suh and Gerson (2013) write, "It is imperative to include technology [in the classroom] if we are to be in line with

today's e-culture and prepare students to be successful participants in a technology-based society" (p. 31). Hutchison and Woodward (2014) also understand the importance of integrating technology into the classroom. The authors believe that teachers have a responsibility to include the best and most modern technology to prepare their students for a technologically centered world. Yet, teachers' varied comfort and confidence levels with digital devices may hinder this responsibility (Puckett, 2013). This self-study was completed to better improve my own practice with integrating technology in math and reading. The purpose was to become more comfortable and effective as an educator when using multiple forms of technology with students. This self-study helped me accomplish this goal by demonstrating most effective practices.

Significance of the Problem

Technology use in the classroom is vital in today's educational society. Students are required to use technology throughout the Common Core State Standards, which encourages students to think in a different manner than before. These standards expect students to know how, when, and why to use technology to enhance their education. Lifelong learners who will succeed in the twenty-first century must be able to self-select technological tools for themselves (Ungerer, 2012; Common Core State Standards Initiative, 2014; NYSED, 2011). In the Common Core State Standards for English Language Arts and Literacy, the authors discuss key design areas for each student who is "college and career ready in Reading, Writing, Speaking, Listening, and Language" (NYSED, 2011, p.5). One of the key design considerations from the standards about students who are college and career ready is:

> They [students] use technology and digital media strategically and capably. Students employ technology thoughtfully to enhance their reading, writing, speaking, listening, and language use. They tailor their searches online to acquire useful information efficiently, and they integrate what they learn using technology with what they learn offline. They are familiar with the strengths and limitations of various technological tools and mediums and can select and use those best suited to their communication goals. (NYSED, 2011, p. 5)

The skills students are expected to develop with technology will help them in their future careers. Students are going to need to be able to decipher from valid and invalid sources of information they receive on the Internet. Educators can teach these skills to their students starting from Kindergarten as the Common Core State Standards suggest in the anchor and writing standards. The authors of the English Language Arts Standards write about students who are college and career ready are able to "integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words" (p.16). Kindergarten writing standard six expands on this idea with the expectation of "with guidance and support from adults, [the students] explore a variety of digital tools to produce and publish writing, including in collaboration with peers" (p.26). Colleges and businesses are expecting students to graduate with many technological skills, which can and should be learned throughout students' K-12 schooling. Whether the skills are writing papers on Microsoft Word or using a touch sensitive tabletop, teachers need to give students a variety of opportunities with these technologies. The International Reading Association (2008) also encourages schools to adopt a wide range

of digital devices in order to "help students understand and use the materials to become more productive and engaged citizens in the twenty-first century" (p. 4).

Purpose for the Study

The purpose of this study was to explore how one kindergarten teacher could use technology in the classroom, given the confines of the technology available. This study was designed to discover the use of technology within a kindergarten classroom to aid in successful lessons that increase student learning. I am going to share my findings with other teachers in the district. My research focus question was:

- How does one kindergarten teacher use technology within the classroom?

In order to explore technology usage in the kindergarten classroom, I reflected on my lesson plans from the week in a journal. The journal allowed me to look back on my teaching practices in my lessons to see potential improvements and existing strengths. I also recorded the amount of professional development I received during the six-week data collection period. In addition to the professional development I received, I collected factual information from our technology department about the yearly budget for technology purchases for the 2013-2014 school year. This information included the types of technology that are available to teachers in the Appleton Central School District (pseudonym) and the amount and types of professional development the District offered its teachers within the last five years concerning technology.

Rationale

As a kindergarten teacher in an elementary school where only special education teachers or teachers of inclusive classrooms have SMARTboards in their rooms, I found it difficult to collaborate with other teachers about how they were using technology.

Every classroom has computers, but all teachers have different comfort levels with them. This was my first year as an inclusive classroom teacher. As a result, I had a SMARTboard in my classroom, which led me to question:

- What other capabilities do SMARTboards possess?
- What strategies are other teachers using with the SMARTboard?
- Are there novel uses for a SMARTboard that I am unaware of?

I answered these questions through my own research as well as professional development I received from the Technology Department in the Appleton School District.

Research Design

For this six-week research project, I was the only participant. The students in my class were not used as participants. Through my findings, I enhanced my own teaching and use of technology in the classroom. The study took place in the Appleton Central School District (ACSD) in a kindergarten classroom. ACSD is located in rural, Western New York. I collected six weeks of data through journaling, factual information, and self-created lesson plans. I wrote in the journal three times a week after each lesson was facilitated. The journal entry discussed the type of technology planned, used, and the effectiveness of the tool. The journal and lesson plans allowed me to see the various digital tools I used, as well as the types of tools I had to self-teach.

Chapter 2- Literature Review

This literature review is based upon technology use within the classroom, specifically in Kindergarten and primary grades. There are four themes: Technology and the Common Core, Types of Technology Available to Teachers and How Technology Is Used in the Classroom, Limitations of Using Technology, and Professional Development for Teachers. Before I begin to review the literature, I want to emphasize that technology within the classroom does not replace teacher instruction; rather technology is used to supplement or aid in learning specific skills (Suh & Gerson, 2013; Hutchison & Woodward, 2014).

Technology and the Common Core

Randi Weingarten, the President of the American Federation of Teachers, states, "As leaders in the classroom and workplace, our members believe the Common Core State Standards represent the best opportunity in a generation to put American students on a path to personal and professional success" (Common Core State Standards Initiative, 2014). Weingarten explains the exact point of the Common Core Learning Standards. The authors of the common core standards drive our students' education in an accelerated fashion. Colleges and businesses are demanding more than ever from our students after they graduate from high school.

The authors of the Common Core State Standards repeatedly express and encourage teachers to prepare our students for success after graduation in today's global economy and society (2014; NYSED, 2011). The skills that our students need are twenty-first century technology skills. Puckett (2013) and others confirm that students need to become proficient twenty-first century learners in order to succeed in today's

society after graduation (Suh & Gerson, 2013; Ungerer, 2012; Hutchison & Woodward, 2014). The push for technology in the classroom is a direct result from the Common Core State Standards. We need to use today's technological tools to enhance learning and understanding of required content material. Northrop and Killeen (2013) write, "Although students can be given direct instruction on technology, technology can also be used to focus on traditional curricular goals to implement the Common Core State Standards" (p.532).

Common Core State Standards necessitate using digital technology in the classroom to promote literacy. Children today are eager consumers of anything digital. By making a connection of out of school practices to in school practices, teachers can link traditional and new literacies. To explore how the Common Core State Standards and technology are connected, Hutchison and Colwell (2014) conducted a study to examine ways that digital technologies are included within curriculum of the Common Core English Language Arts Standards to support literacy. Second, the authors wanted to show teachers how the technology standards can be used with "non-technology-specific standards" (p.148). The researchers collected data through an organized review of literature published from 2000-2013 concerning the digital technology uses in grade 9-12 classrooms. To find data, three databases were searched: ERIC, Education Research Complete, and Education Full Text. The authors searched major literacy journals for articles as well. From the search, 491 articles were found and then narrowed down to 10 studies. Each study focused on a different digital tool. The digital tools discussed were PowerPoint, iPad/tablet apps, laptops with Internet, webpage design tools, online threaded discussion boards, Diigo, PhotoStory 3, podcasts, wiki, iPhoto, and iMovie.

Once all of the literature was reviewed, four themes emerged from the analysis of the studies.

One of the emerging themes discussed was collaboration. The Common Core State Standards clearly state a need for collaboration with peers when using digital tools (NYSED, 2014). Hutchison and Colwell (2014) express how in one study the Diigo app allowed students to annotate within an ebook or article. The annotations can then be directly shared with classmates. The students are then exposed to different points of view of the same text. A second emerging theme discussed was sharing information and soliciting feedback. The authors explained that one of the Common Core State Standards focuses on using digital technology to share information with others. One of the studies analyzed discussed the use of podcasts to present ideas. The students in the study created stories shared through podcasts for third grade students. Using the podcasts allowed for students who struggled with literacy to participate. Podcasts are created through voice, which "mitigated some language barriers, such as spelling and punctuation, that many ELLs struggle to master, creating a more positive learning environment" (p.153). All of the studies examined shared numerous ways that digital tools can be incorporated within the literacy classroom.

Types of Technology and How Technology Is Used

The purpose of technology should be to aid in the learning of the material, rather than to be the sole attention of the lesson. The technological tools that the teacher chooses to use should not drive purposeful learning, but the teacher's intentional instructional planning should drive the students' learning (National Association for the Education of Young Children, 2008). Once the objectives of the lesson and appropriate technology are

selected, teachers then need to decide whether or not the technology is offering instruction at the students' level of understanding (Northrop & Killeen, 2013). The appropriate use of technology to supplement a lesson will increase the value of a lesson and aid in engaging students in the classroom. The following subheadings describe how some teachers and researchers use technology within their own classrooms to ensure purposeful learning.

iPads and Other Tablets

The quick acceptance of iPads within the classroom has made many teachers adapt their instruction to be able to use the iPad effectively. This is true in my own personal experience; I have adapted my instruction to integrate iPads more fully into instruction. Students that have worked on iPads in my classroom are always very eager and excited to have the opportunity to use them. The iPad offers students many possibilities due to the App Store. An "app" or application is a software program for a mobile device that mainly has one function and provides a small bit of "entertainment" (Campbell, 2011). The App Store has thousands of apps for teachers to download and use with their students—many of them free! There are apps for math, reading, writing, and many more educational topics. Some teachers are using iPads as a center to enhance the students' understanding of a topic.

One way to teach students how to use an iPad app is through the Gradual Release of Responsibility Theory (Northrop & Killeen, 2013). Children need to learn the educational concept separate from their use of the iPad. This solidifies conceptual understanding prior to applied practice on the technological device. Northrop and Killeen discuss the many different ways to teach the educational concept without the

iPad. For example, the authors discuss the topic of letter-name phonics. Students would need to understand the initial, middle, and final sounds in the words before using the iPad. They suggest using word sorts to get the students fully aware of the entire word in front of them in a "hands-on and manipulative way" (Northrop & Killeen, p.534). After the student understands the concept through various approaches, the teacher must explain and model the app using "think aloud." The teacher will need to show the students how to open, access, and close the app. After modeling how to use the app, the teacher will provide the students with guided practice using the app. The teacher will be available to troubleshoot any questions or concerns. Finally, once the teacher has made sure that the students understand the app focusing on the targeted skill, the students can now work with the app independently at a center (Northrop and Killeen; Suh & Gerson, 2013). Suh and Gerson discuss two considerations for teachers when incorporating technology in the classroom. The students need to have "interactive feedback" (p.32) from the tablet. When the student does not perform correctly with the program, the game will immediately tell the student that his or her answer was incorrect. Another consideration for teachers is to maintain their classroom expectations for on-task behavior. Students tend to become anxious while waiting for their turn on the tablet. There needs to be a consequence for watching the tablet center to avoid this distraction. If a student is watching the tablet center instead of completing his or her work, the student will lose the privilege of working on the tablets. However, if the student is working quietly at his or her seat, his or her "reward" is the earned tablet time. Tablet computers, such as the iPad, have the potential to be a crucial part of individual education plans. Students can learn with the iPad apps at their own level and needs (Johnson, 2013). The use of iPads in the

classroom is greatly beneficial, but we first must teach students how to use the applications so that the students are not just pushing buttons and swiping left and right. We want the technology tool to enhance the learning of a skill, not to just act as a time filler to play a game. The real strength of tablet technology is the ability to customize instruction for each individual student.

Flewitt and Kucirkova (2014) explored the use of iPads in the classroom for students with disabilities. The researchers were interested in finding ways that students with disabilities could still participate in literacy-based activities through the use of the iPads. The study was conducted in a special school in the English Midlands for students whose ages ranged from 3 to 19 years old. The school offered many different resources including a "sensory room, music recording systems, hydro-therapy pool and a range of augmentative communication devices…" (p. 110). IPads were introduced to the school the year prior to the study. Data were collected through interviews, video recorded observations, and annotated notes from three mixed-age classrooms. Students in the classrooms were classified as having physical, learning, or communication disabilities.

The researchers discovered that each classroom had used the iPad in varying ways with students. Overall, all of the classrooms had enthusiastic responses from teachers and students. One of the teachers had expressed that the mobility of the iPad allowed for more "independent and flexible" use (Flewitt & Kucirkova, 2014, p.111). For example, one student needed to work in a "weight-bearing stander" unit with the physical therapist. The unit would confine the student to more tabletop activities. The student would not have been able to participate in the learning activity with the rest of the group if the iPad was not used. The iPad's mobility and size made it possible for a "stander" unit to

include and iPad. Flewitt and Kucirkova write, "As the children waited for the teacher-directed phonics activity to begin, they cradled the iPads lovingly in their arms, stroked them and smiled happily at each other…" (p.112). The authors suggest that the concept of "touch" was the driving force for higher leveling thinking and learning of the students in the study. Once the students were able to effectively access information from their teachers, more opportunities for learning and communicating were available.

Tabletops

Interactive tabletops are new technology that are beginning to emerge in schools today. The tabletop is rectangular in shape and designed to allow multiple users to interact with the display concurrently. The iPad and PC require their users to huddle around one person who is the controller, while the interactive tabletop allows multiple users (Jackson, Brummel, Pollet, & Greer, 2013). The interactive tabletops can be used for any content area. The great appeal of this device is the fact that it can be portable (can have a stand or not) and can be used to address the needs of its users.

In the study Jackson, et al (2013) conducted, the team designed a tabletop fit the needs of the researchers. The purpose of the study was to explore the effect of an interactive tabletop on the collaborative technologies and mathematical achievement. The tabletop was forty-two inches in diameter and did not have a stand, so that it can be completely portable and to fit on any surface in the classroom. The tabletop created used "infrared optical detection" (p. 315). This feature allowed the tabletop to recognize thirty-two touches occurring at the same time. The tabletop was created to connect to other devices via the Internet. The researchers discussed the content of the material being used on the tabletop with school officials. As a team, an agreement was made to have all

programs created and used on the tabletop concerning mathematics. The games designed for the study encouraged students to work collaboratively to solve math problems relevant to the topics covered in the fourth grade class. The researchers obtained the participant's grades in math to use as a measurement of knowledge growth. Twice a week, the tabletop was brought into the classroom. Four students at a time were able to practice math concepts in ten-minute blocks through the games on the tabletop. As a result of the study, researchers found the students enjoyed working together in groups on the "giant iPad" (p.323). The students' achievement scores increased as well. Overall, the researchers stated that the students demonstrated and increase in their performance in math through the use of interactive tabletops.

eBooks

eBooks are possible through the use of iPads or other tablet computers (Kindle and Surface). An eBook is an electronic book that can be read on a digital device. The eBook can offer its audience many features. The eBook enables the reader to completely interact with the book on a more in-depth level. Some eBooks have a feature when a user taps on a picture or a highlighted word that brings up a vocabulary term, which may be unknown to the child. The features discussed will help to expand the child's knowledge of the story (Korat & Shamir, 2007). Other eBooks have comprehension questions at the conclusion of the book. One of the main benefits of the eBook is the audible narration that goes along with the animated pictures.

According to Suh and Gerson, kindergarten students were able to comprehend and learn new vocabulary words on an eBook story when compared to a print story (2013). However, Labbo and Kuhn (2000) conducted a study concerning eBooks and found two

completely different results. The authors' study had one typical, kindergarten student as the participant. The authors studied the student's interactions with the two eBooks selected (*Stellaluna* by Janell Cannon and *Arthur's Teacher Trouble* by Marc Brown). These two books were chosen because the child's classroom teacher enjoyed and respected the authors of the books. The researchers analyzed the eBooks based on whether the screens were passive or interactive. Each action of the eBook was analyzed as "integral, incidental, or incongruent" (p.193). For example, if the student were to click on Arthur and Arthur made a statement that supplemented the text, the action was labeled as *integral*. If the student clicked on a sink and water flowed from the faucet, the action would be marked as *incidental*. Lastly, if a tray of cookies sprouted a top hat and began singing a barbershop quartet, the action would be categorized as *incongruent.* Before asking the student to participate in the study, the researchers examined the features of the eBooks. At a quick glance at the eBooks, the researchers were able to identify differences between the features of the two books. *Stellaluna* integrated "music, sound effects, and animation in ways that appeared to flow harmoniously with play mode" (p.192). On the other hand, *Arthur's Teacher Trouble* combined "music, sound effects, and animation that appeared …discordant with the story during the play mode" (p.192).

When the researchers asked the participant to point to what he was looking at on the screen, the researchers were able to assess under what category the action would be placed on the data collection sheet. Labbo and Kuhn (2000) had found the participant was either passively attentive to the eBook and going through the motions without high-level thinking, or the participant had the complete opposite experience connecting to the text with affect, cognition, metacognition, and high-level thinking. The authors found when

the features of the eBook were not congruent to the story, the child passively engaged with the text. The participant in the study was given a retelling task with KidPix at the conclusion of each eBook. The student's retellings were very indicative of the eBook's efficacy. The participant's retelling of the story *Stellaluna* was much more coherant than his retelling of *Arthur's Teacher Trouble*. When comparing the two eBooks and the student's performance, the authors were able to draw the conclusion that features of an eBook need to be *integral* to the text in order for the student to connect with the text.

Korat and Shamir (2007) wanted to further examine Labbo and Kuhn's study. The researchers created an eBook specifically for their study to analyze. Korat and Shamir's study reports:

> When designing the educational e-book based on the hardcover copy of this book, we integrated features that capitalize on the potential of such electronic and e-interactive media to motivate and amuse children, on the one hand, and also included features thought to be supportive for children's emergent literacy and language, on the other. (p.251)

The authors compared the eBook reading to a student who was read to by an adult in print form. There were 128-kindergarten students who participated in the study. The participants were selected at random and then divided into three groups: electronic reading group, printed version group, and control group (regular kindergarten program). Pre-tests and post-tests were measured by knowledge of vocabulary, word recognition, and phonological awareness. Korat and Shamir found that when compared to reading with an adult, the students who read the eBook performed similarly on the emergent literacy test they used as a pre/post test. The two groups also shared a similar

comprehension level even though one group was read the text aloud and the other group read the eBook. The eBook can be a beneficial tool if created so that a student's experience with the eBook is interactive.

The eBook can also be used as a center. The teacher will need to directly teach the students how to access the eBook library on the tablet or iPad as suggested above by Northrop and Killeen (2013). The students could be reading with the eBook and completing the comprehension activities all within the allotted center time. This technology would be an engaging and motivating center for students. Again, the beauty of the eBook is that it can be differentiated to meet the needs of all learners regardless of their reading level.

Interactive Whiteboards

An interactive whiteboard (IWB) is touch-sensitive and can be wall mounted. The IWB must be connected to a computer and a projector in order to display an enlarged version of instructional material or Internet website. Students and teachers can manipulate the enlarged material by using their hand, stylus, or eraser (Linder, 2013). Two companies that produce this type of technology are SMARTboard and Promethean. This type of technology allows students to become involved with their content material; interactive whiteboards can make the learning come alive. Teachers can use the IWBs to enlarge the desired math practice sheet and allow students to write on the page to demonstrate their learning. Linder writes about how children who use the IWB in their lessons develop a deeper understanding of topics than children where technology is not incorporated into the lessons.

Some strategies that Linder (2012) suggests are to use an IWB for introducing a topic and then wrapping up the topic. Linder recommends giving students an opportunity to have the new concepts modeled for them on the IWB and then be given the chance to manipulate the materials themselves at their seats. With the use of the IWB, students are given clear, effective access to what the teacher wants them to do. This accessibility is due to the picture being large enough for the students to observe the teacher manipulating the material. The students can then go back and complete the task themselves with the concrete materials. At the end of the lesson the teacher can summarize the topic of the lesson and wrap up with the use of the IWB (Linder, 2012).

Kristy Goodwin (2008) discusses a study that she facilitated concerning IWB's. She compared two kindergarten math classes learning about fractions consisting of 43 students between the ages of four and five. The "intervention" class was given many technological tools to aid in learning about fractions. The "non-intervention" class was given "static, inert representations of fractions, through the completion of text-book exercises" (p.106). The study was over a course of twelve weeks. Data were collected through "pre-and post-intervention student drawings from both classes, screen recordings of intervention students' computer work, and intervention students' drawings collected throughout the intervention period" (p.108). The technological tools used in the intervention classroom were instructive, manipulative, and constructive. Such tools included CDs, digital learning objects (DLOs), KidPix and Kidspiration. All of the tools were presented first through the IWB. The teacher modeled each tool for the class to ensure the students use the tool effectively. At the end of the study, the students' were asked, "What is the first thing that comes to your mind when you think of a fraction?"

(p.108). From the data collected, the growth of the students in the fractions intervention class increased significantly from the pretest. The student's knowledge of fractions was more robust than those in the comparison "nonintervention" class. According to the study, "The intervention class made significant gains in terms of their mathematical, representational, and symbolic development, with all students' responses showing growth" (p.111). This suggests that the technology tools that were demonstrated and used through the IWB can elevate a student's understanding of concepts.

Computers

Newer technologies such as tablets and iPads are important, but computers also serve a purpose in the classroom. Computers offer many software programs that students can use to increase their knowledge of designated topics. Students can access a multitude of websites as well as practice certain skills. Puckett (2013) explains that the implementation of technology tools, like computer software, does increase student engagement during their time on the multimedia outlet. When students participate in a multimedia activity, they are able to tap into their own personal learning style. When student engagement increases, the behavior concerns of a classroom also decrease—a direct correlation. Since there are fewer disruptions from students, the teacher is able to cover the material in a much richer way.

Students can also engage in technological learning opportunities at home. In a study of the software program Funnix, teachers saw an increase in the students' skill set in literacy (Watson & Hempenstall, 2008). Funnix is an engaging computer program that had students working at home on their literacy skills such as phonemic awareness. The program focuses on blending and segmenting since this is a major component in learning

to read. There were 31 students, ages four to seven years old, who participated in the study. Sixteen of the students were enrolled in kindergarten, while fifteen were enrolled in first grade. Before the study began, the parents were given a training session, instruction sheet, and a program guide to accompany the CD software since this program was meant to take place at home. The daily program is a thirty-minute lesson that gives direct feedback, corrections, and re-presentation when needed. In the study, students who participated in the software made greater gains in literacy than students who did not participate. Specifically, those students made gains in their ability to correlate letters and sounds, oral reading fluency, and nonsense word reading than students who did not participate in the software program. The study measured four different components of reading: phonological awareness, letter-sound fluency, oral reading fluency, and word attack. The study showed significant increase with the experimental group. For example, the kindergarten experimental group increased from the 37th to the 68th percentile rank in phonological awareness composite. The study showed that the experimental group overall made greater gains than the comparison group.

Another computer software program was assessed on the use of effectively teaching students new words and letter sound/name correlation—Tutoring Buddy. The Tutoring Buddy program used three types of flashcard drill types on the computer: Traditional Drill, Interspersed Training, and Incremental Rehearsal (Volpe, Burns, DuBois, & Zaslofsky, 2011). The students were also able to work at their own level with this software.

Volpe et. al (2011) compared the three types of flashcard approaches. Traditional drill is when a word is presented and modeled for the child. The child is then required to

restate the word and is presented with more words until each has been learned. Interspersed Training is when the teacher included known words within the unknown words "in the following manner, K-U-U-U-K-U-U-U-K…" (p. 333). The "K" stands for "known" and "U" for "unknown". Incremental Rehearsal is taught through oral reading fluency and reading comprehension. There were four kindergarten students from an urban school in the Northeast United States who participated in the study. The Tutoring Buddy program on the computer administered a pre-test for letter sound expression. Once the pre-test had been completed, the program began proceeding with the flashcard routines. The flashcards were supplemental to the regular intervention strategies the classroom teacher used. After the research was completed, the researchers found that the intervention of the flashcard routine was "highly acceptable to the tutees [participants]" (p. 339). In other words, the computer based tutoring program was highly effective for the students in the study. Data from the study showed that each student increased by six and nine letter sounds from the beginning of the intervention. Having a computer program that can assist students in the areas they are lacking can be very beneficial to teachers' instruction.

Another way that computers are being utilized is to create a monthly newsletter for parents to connect with the schools (National Association for the Education of Young Children 2008; Walsh, Cromer, Weigel & Sanders, 2014). Walsh et. al (2014) conducted a study to measure the approaches teachers made to create a stronger connection between home and school. The study was conducted in a large district in the Western US over the course of four months. The study involved eight classes for a total of 72 children of Pre-K students, aged 49-68 months old. Families and teachers from four schools also

participated. The study was centered around four teachers, a teacher coach, and a teacher coordinator. These educators interacted with 74 parents and collected 98 monthly parent logs over the course of the study. The participants created DVD newsletters from February to May of 2012. Each newsletter focused on social and emotional skill building and problem solving. Teachers were given training on how to create the DVDs. The DVD's contained a classroom schedule, announcements, teaching and learning from the classroom, general information, and a final message from the teacher. Each DVD contained examples of problem solving in hopes of having the skills transfer at home as well. Data collected through the study depended on parent logs and student interviews about the DVDs. The parent logs required the parents to document how many times the child watched the DVD, who the child watched the DVD with, and comments about the child's experience with the DVD.

The findings of the study showed that 97% of students watched the DVD at home. 95% of parents wanted the DVD with their children. 29% of students watched the DVD with other family members. 7% of children reported watching the DVD alone as well as with a parent. On average, the families watched the DVD 2.7 times per month over the course of the study. The results of the student interviews show that 55% recalled watching the DVD at home. Six students recalled watching the DVD in school which may suggest that a stronger connection with the DVD was made at home than at school (Walsh, Cromer, & Weigel, 2013; Walsh et. al, 2014).

Computers can be used to make and take Virtual Field Trips (VFT) as well. A virtual field trip is a technology-based experience that has children taking a journey to another location without actually leaving the classroom (Kirchen, 2011). Virtual field

trips can range from a PowerPoint to a multimedia experience. Virtual Field Trips allow students to experience the rainforest, ancient Greece, or the Great Wall of China without ever setting foot outside the school. These are locations that students would not normally experience. Many websites offer premade VFTs. Such sites include, but are not limited to: Scholastic, Utah Educational Network, Meet Me at the Corner, PBS Kids, US government, and 4-H. These websites all offer countless educational opportunities to their audiences.

Assistive Technology

Assistive technology is an all-encompassing term for technological tools that aid students with disabilities. In an article by Barbara Boyd (2008), types of assistive technology are explained in depth. Boyd states that assistive technology can achieve great success if the teacher and student understand how to use it and if the teacher appropriately integrates it within the curriculum. She also explains that the assistive technology tools should be "simple to set up, customize, and use" (p. 31). The tools also can be high or low tech. Some types of assistive technology include: tape recorders, computers, keyboards (BigKeys Keyboard & Intellikeys), digital cameras, Go Talk (somewhat like a tablet), Kidpix, Kidspiration, Virtual Field Trips, Picture This—Professional, Boardmaker, and many more.

Some of the tools may seem simple, but to a student who needs help on an assignment, these tools could improve his or her learning. For example, a digital camera is an often overlooked technological tool; however, the digital camera can be used in many ways in the classroom. Teachers can take pictures of the student's daily tasks or ongoing projects and can create online portfolios for parents to view. Students can take

pictures of the books they have read and then write about their favorite parts. They could also create a book using the pictures they take (National Association for the Education of Young Children, 2008).

A study by White and Robertson (2014) was created to determine the effects on a student's reading and comprehension abilities through the use of assistive technology, specifically, Kurzweil. The researchers wanted to ascertain if students could learn the Kurzweil software program within a six-week time frame. The study consisted of one specialized class of five students in Ontario, Canada. Reading was challenging for these students, resulting in reading levels two or more grade levels below the norm. Data were collected throughout the study through the use of interviews, observations, student artifacts and reading tests. During the study, the researchers met with the classroom teachers weekly to discuss data and to explore strategies to help increase student learning of the Kurzweil program. Each student had objectives specially assigned to him or her. All of the students has previous experience with Kurzweil but had not met mastery of the program. Throughout the study, the teachers taught the students different pieces of the Kurzweil program through small group/ individual instruction and incorporated new reading strategies to build the students skill level.

When the study was completed, the researchers were able to conclude that a small group of student's ages eight to ten years of age can become masters of Kurzweil during a six week study. The students were motivated to use Kurzweil to read, and had increased comprehension and fluency when using Kurzweil (White & Robertson, 2014). At the conclusion of the study, the students were also able to scan their own books, type faster, create presentations, and download email attachments all with the Kurzweil program.

When given the reading posttest *without* Kurzweil, three students reading level remained the same, while two student's level increased by half a grade level. When given the reading posttest *with* Kurzweil, four students reading level increased by half a grade level, and one increased by a full grade level. Overall, by using the Kurzweil program, the students were able to access and understand more text, use note-taking strategies, and ultimately increase their confidence in reading.

Limitations of Using Technology and Professional Development for Teachers

Integrating technology into the classroom can be an easy, obtainable task, but there are some limitations. These limitations can be due to availability, funding, teacher usage, teacher training, teacher perceptions, and teacher preparation (Puckett, 2013). Funding is a major setback for some teachers and districts. Funding for more technological tools is often diverted to other district needs. Most technological tools are expensive and require maintenance. Billions of dollars have been spent on technological tools for school districts. Even if the school does spend the money on the technological tools, they still need to educate the teachers in their usage or they are obsolete (Brawner & Allen, 2006).

As stated above, teacher usage of technological tools can also be a limitation. If a teacher does not feel comfortable with technology, he or she will not use it (Puckett, 2013; Clarke & Zagarell, 2012). Districts need to provide teachers with professional development opportunities to learn how to integrate the SMARTboard or iPad into instruction that is in their classroom. Technology should not be something that is feared by teachers. In fact, technology can be integrated into the student's learning every single day (Birnbaum, 2006). A grant called the "Preparing Tomorrow's Teachers to Use

Technology (PT3)" is used to prepare college students for their teaching profession. The grant requires college students to log their use of technology during student teaching as well as complete surveys about their use of technology (Brawner & Allen, 2006). An analysis of the results of the grant shows that if new teachers are required to learn and use technology it is of greater likelihood that they will continue to use the technology in their future careers. The grant will better prepare our future teachers for the societal demands of having students become lifelong, twenty-first century learners.

In addition to the grant explained above, teachers should be provided with professional development opportunities through their districts (Pelgrum, 2001). If teachers are to effectively use technology, districts need to be sure that they are properly trained. Pelgrum conducted a study of numerous countries concerning technology in the schools. The countries who participated are listed in Figure 1 that follows.

Countries Used In Pelgrum Study
• Belgium • Bulgaria • Canada • China- Hong Kong • Chinese Taipei • Cyprus • Czech Republic • Denmark • Finland • France • Hungary • Iceland • Israel • Italy • Japan • Latvia • Lithuania • Luxembourg • New Zealand • Normway • Russian Federation • Singapore • Slovenia • Slovac Republic • South Africa • Thailand

Figure 1. Countries used in Pelgrum Study. This figure illustrates the twenty-six countries that participated in the study.

The countries were sampled based on the three levels of the education system (primary, middle, and high school). There were some schools who participated in all three levels of education, while some only participated in primary or lower secondary school (middle school). The researchers were looking for the technological skills of the staff. The research asked the staff to rate how well prepared they felt they were in several technological areas such as application of software to track student progress and evaluation and selection of instructional software. When looking at the data collected from Pelgrum's study, many technological obstacles emerged.

From the study, the teacher's top two highest obstacles for technology use were the insufficient number of computers for students' and the teacher's lack of knowledge

and skills (Pelgrum, 2001). The teachers also had concerns about the number of copies of software programs available to their classes. Another emerging obstacle was the ability to have multiple students accessing the Internet at once. The teachers needed simultaneous access for all of their students, as well as the rest of the school. Teachers who took the survey were also concerned that the staff's level of training was too low. Pelgrum suggests that the outcomes from the study may boost some of the participating school's technology departments. This study further demonstrates that teachers need training on the technologies the schools are providing to further enhance our teaching.

Puckett (2013) writes about how teachers are eager to use technology but they end up using it ineffectively because they are untrained. When teachers are thinking of creating the DVD monthly newsletter explained in the previous section (Walsh et. al, 2013), we need to make sure that teachers know how to operate a video camera and video editing program. We need technology to be used effectively. Again, if a teacher does not feel comfortable or if her or she feels apprehensive about implementing technology, we need to provide him or her with the proper skills. A student would never be asked to try a math problem without giving them the proper prerequisite skills needed to complete the task. The same is true for our teachers. Liu (2012) writes about how teachers should have the opportunity to be involved in training by identifying areas of weakness. For example, if a teacher feels the need for more training on how to use the SMARTboard, then he or she should be provided with additional training.

Once teachers become more comfortable with technology, they will begin to use it more frequently. Teachers can then effectively create lesson plans that integrate technology every day. The HEAT format can be used to ensure all aspects of effective

learning can occur. HEAT stands for: higher-order thinking, engaged learning, authentic learning, and technology integration (Tassell, Stobaugh, & Maxwell, 2013). The authors conducted a case study on "pre-service" elementary teacher's lesson plans over a year. The researchers taught the HEAT format to their students within the year. Forty-seven students participated in the study, creating one hundred and thirty-six lesson plans to be evaluated. The lesson plans were assessed and were then compared to previous year's lesson plans. The previous year's lesson plans served as a baseline for the evaluators to see the growth in lesson plans with the HEAT format. Tassell et. al believed that the students participating in the study were capable of achieving a three out of four or higher on the evaluations of the lesson plans. Once the study was completed, the researchers were able to draw the following conclusion:

> When you take into account that these courses were the students' first exposure to teaching methods, the results of this study did demonstrate that the professors' instruction of the HEAT framework and the HEAT instrument itself became clearer to students during the second year of the HEAT implementation. (p. 20)

The teachers in this study were properly trained in integrating technology within their daily lessons in addition to higher-level thinking, engaged learning and authentic learning. If more teachers were properly trained to integrate technology into content lessons, lesson plans and instruction would be more effective. This change would then result in students who are engaged and learning.

Summary

Overall, the authors of the articles cited all agree that technology should be utilized effectively within the classroom. The authors of the articles touch on several

important key ideas. First, Common Core calls for technology integration. An integral part of College and Career Readiness calls for 21st century tools for learning. Next, the studies show that there are many forms of technology available to use in the classroom; technology can enhance traditional teaching. An important conclusion drawn from the studies is that technology can become an excellent tool for teaching reading. Technology provides the means for differentiated instruction in order to maximize student growth. Even time-tested technologies such as the computer can be an effective tool in learning. Computers are a pathway for a wealth of information beyond the classroom as well as a tool for better demonstrating knowledge. Finally, the studies clearly articulate that funding and training are obstacles for integrating technology into learning; however, the research clearly demonstrates the need to integrate technology in the classroom. The studies identify the need for technology in a twenty-first century education.

Chapter 3- Methods

The purpose of this study was to discover how I, a kindergarten teacher, used technology within the classroom. I believe that teachers need to stay current with technology within the classroom, but I also recognize many obstacles making technology integration difficult. The demanding Common Core State Standards many teachers are finding to be very challenging for students are one of the greatest obstacles; it is difficult to integrate technology into an unfamiliar curriculum. I continue to assess my own methods of integrating technology within the classroom. Another obstacle that I am faced throughout the day concerning technology was effectively using the technology when integrated into content lessons. Also, I am not completely trained on the SMARTboard in my classroom. Technology opportunities are lost due to a lack of professional development. As a result I shared my findings with other teachers in my building and encouraged more technological professional development for all staff.

Participant and Positionality

This research project had one human participant. I was the only participant. I am a 24-year-old Caucasian female currently living in Western New York. Before beginning my Master's degree in Childhood Literacy, I earned a Bachelor's of Science degree in Interdisciplinary Arts for Children with a concentration in Music and Childhood Inclusive Education. In an attempt to make myself more employable, I have four New York State teaching certifications. These certifications include Early Childhood birth-grade 2, Students with Disabilities birth-grade 2, Childhood Education grades 1-6, and Students with Disabilities grades 1-6.

Previously, I worked with students in grades K-3 as a Consultant Special Education Teacher. This position was a one-year, long-term substitute position. During my time as the Consultant Special Education Teacher, I taught English Language Arts and Mathematics to students with disabilities in grades of Kindergarten to Third grade.

Following that position, I began working at Appleton Central School District (pseudonym). This year was my second year at ACSD as a Kindergarten teacher. My inclusive classroom consisted of 19 students.

Until I began my course work in my graduate degree program, I had not learned about different digital devices that are available to teachers. In my mind, whenever I thought of technological tools for teachers, I would think about SMARTboards, SMARTtables, iPads, and other costly items. However, in my graduate classes I learned about Voki's, edModo, Voice Thread, and Instagram. All these tools are free to use, which is appealing to teachers.

At the beginning of this project, I had not had any professional development concerning technology. Any type of technology (including websites) I used within my classroom, I researched independently or used what I had learned in my coursework from graduate school.

Setting

This study took place in Western New York in a rural elementary school with a population of 858 students (NYSED, 2015). The percentage of students eligible for free lunches was 45% and reduced price lunch was 9%. The classroom in which this study took place was an inclusive kindergarten classroom of 19 students, consisting of nine boys and ten girls. Of these students, two were Hispanic, four were African-American

and thirteen were Caucasian. Four students were classified as students with disabilities. Three of the students were classified as "Speech and Language Impaired," while one student was classified as "Intellectually Disabled." These students receive related services throughout the day. During the study, the providers that pushed into my classroom and pulled students out included a Speech Therapist, an Occupational Therapist, a FUNdations teacher, a School Counselor, a Physical Therapist, an English as a Second Language teacher, a Special Education Teacher, and an AIS provider.

During the course of this study, technology tools at my disposal in my classroom and ready for use included a SMARTboard, CD player, three student computers, one teacher computer, Waterford Early Learning software (for the PCs) and a digital camera. The three student computers I had in my room were mainly used with a literacy software program called Waterford Early Learning.

In order to increase my own knowledge of technology, I attended some individual professional development sessions with the Technology Department at ACS. I found in the last year and a half that I have been a member of this district we have not had a professional development session on specific technological tools. My findings have been presented to my building principal and to other teachers at a faculty meeting in order to encourage more technology professional development.

Methods of Data Collection and Procedures

For this study, I had one overall question. My research question for this project was:

- How does one Kindergarten teacher use technology in the classroom?

I selected three ways of collecting data for this research project; I collected data through the use of journaling, content analysis of lesson plans, and factual information from the district using the constant comparative method of analysis. The three forms of data allowed for a triangulation of data and to discover emerging themes. The data collection period spanned six weeks during one semester.

Journaling

I wrote in my journal three times a week for six weeks. A template of the journal page can be found in Appendix A. I wrote in the journal three days a week: Monday, Wednesday and Friday. On Mondays, I recorded about Math. On Wednesdays, I logged about Reading (ELA). On Fridays, I wrote in my journal about Science and Social Studies. I was able to analyze my use of technology throughout multiple contexts. I wrote about the type of technology used in the lesson. I also wrote about how I felt the technology aided or hindered the lesson. The journal was set up in a "T-Chart" fashion. The left side consisted of direct observations made during the lesson while using the technology while the right side contained my qualitative assessment about the technology. The journal was also used to record research that I conducted myself about technology. In addition, I used the journal to record any professional development workshops I attended that concerned technology during the six-week period. The journal showed the relationship between what professional development the ACSD offered, compared to what I needed to do to keep up to date and use technology more effectively. I analyzed the data from my journal at the end of each week by reading through each entry. After reading each entry, I color-coded based on the emerging themes of using

technology to motivate students, to review material, and to acknowledge student interests. From this information, I was able to see a pattern in my use of technology.

Lesson Plans

Another method used to collect data was through the lesson planning process. The lesson plans were written a week in advance. The lesson plans included the content area (ex: Math, ELA, Science & Social Studies), lesson topic, the actual lesson plan, and the type of technology intended to be used. Also, the lesson plan template included a sentence that asked, "Was the planned technology used? Yes or No." This method helped me track the number of time technology was actually used. I kept a tally chart from my lesson plans on the number of times I used the planned technology. I was able to compare the number of times that I planned to use technology in a lesson and the number of times I actually used it. This data shows my comfort level with technology as well. I analyzed the data from my lesson plans at the end of each week by using the journal entry analysis as feedback for future planning. I was able to take away non-effective technology tools and continue implementing those that were effective.

Factual Information

I obtained factual information concerning technology from the district. I collected the information from our Technology Coordinator concerning the ACSD technology budget and professional development sessions. This information was given to me in an Excel spreadsheet. I was able to discover what types of technology ACSD had to offer its teachers, as well as how much money was set aside yearly to purchase new technology tools. Also, I researched the professional development sessions involving technology that the Appleton district had offered its teachers within the last five years. At the end of

the study, I was able to analyze the types of technology tools the school has by contrasting the available inventory with what was used and recorded in my logs. This analysis helped identify areas of opportunity for me to integrate more technology in the classroom.

Trustworthiness

The duration of the research study was six weeks over one semester. There was a total of eighteen lesson plans analyzed, along with eighteen journal entries from the Appleton Central School District. The three methods of data collection I used allowed for a triangulation of data. An accurate and useful research project must incorporate more than just qualitative analysis. Using three data collection methods helped to strike a balance between the subjective impressions of integrating technology into teaching and the objective measurement of types and frequencies of technology usage. After thoughtful analysis, I am confident that my research shows that I used technology to review material, motivate and interest students.

Chapter 4- Results

When I analyzed the data I collected, I identified three principle uses of technology in my classroom. Also, I was able to distinguish several themes in my utilization of technology. I was able to see that I use technology within the classroom to: 1) motivate, 2) interest, and 3) review. My analysis and related themes centered on internal and external motivation. Before I begin to discuss the themes that emerged from the study, I need to explain what extrinsic motivation and intrinsic motivation exactly means and how it influenced my findings of interest and motivation. According to Moldovan (2014), extrinsic motivation, in a school setting, is defined as, " when the student falls into school discipline without a direct interest in what is taught, but to receive, directly or indirectly, certain rewards" (p.204). In other words, the student is motivated by a reward to complete tasks. In the following paragraphs, when I speak of motivation, I am referring to *extrinsic* motivation. In the same study, Moldovan explains intrinsic motivation as, "where the learning and the acquiring knowledge interests directly the student" (p.204). In this context, motivation means the students are driven by themselves or their attainment of knowledge to learn. Students are driven by an internal need for knowledge; the student desires to attain personal growth. Their reward is the new understanding and feeling of self-pride. In the following paragraphs, when I speak of interest, I am referring to *intrinsic* motivation.

In the course of my research, I also discovered that if I wanted to have any professional development concerning technology, I either needed to encourage the Technology Department to provide some support, or I needed to research other technologies independently. Figure 2 reports the number of times throughout the data

collection period that I used the technology for the three themes. Figure 3 displays the different technology tools used within the classroom throughout the six-week data collection period.

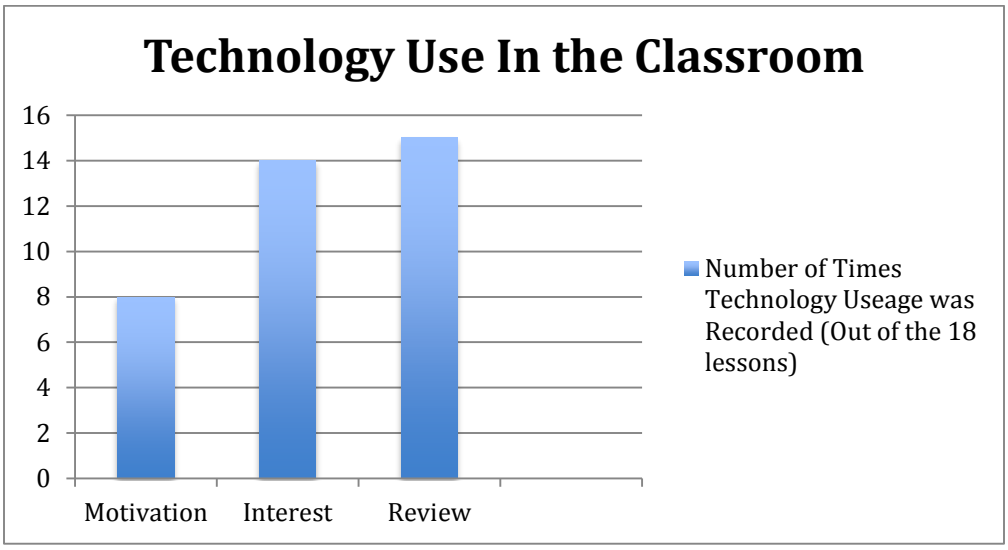

Figure 2: Technology Use In the Classroom. This figure illustrates the categories for technology usage. The numbers indicate the number of lessons the theme emerged.

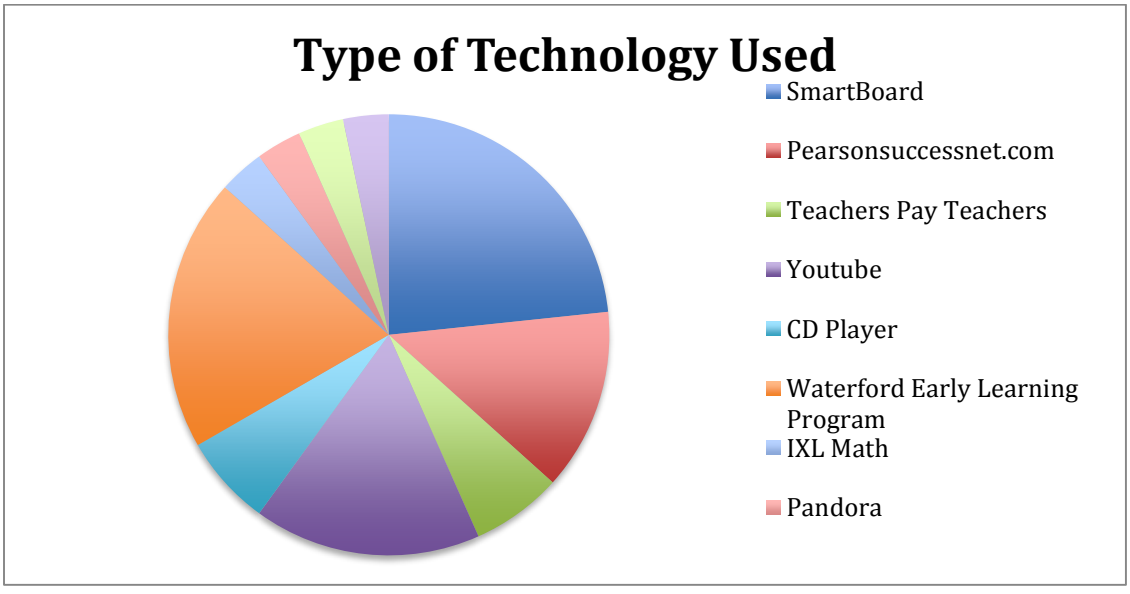

Figure 3: Types of Technology Used. This figure illustrates the variety of technological tools used in the classroom during the data collection period.

Motivation

Data were collected during three different content areas, three times a week. After coding the data, I found that in eight out of eighteen lessons, I used technology as a source of motivation for my students. I used the Waterford Early Learning Program, YouTube videos to practice letter sounds and sight words, and IXL Math to motivate students. For example, on October 15th, 2014 I used technology as a motivational tool for William. I noticed that William was inattentive during the reading lesson. He was making noises, looking around the room, and not completing his work (I know from previous experience that computers are exciting for William. He often asks to use the computers.). I motivated William by telling him if he got his class work done then he could work on the computer. He was pleased with my response and completed his work the best of his ability. As I stated previously, William loves using the computers, and they were a powerful motivator for him. Since the computer motivated him so much, I will be looking for other technologies to differentiate his instruction to more adequately fit his needs and interests. I will be looking for additional computer based programs/ games that align with our curriculum in the future. For example, if there is a difficult topic for William, the computer may motivate him to be a more willing participant in completing the tasks.

Another example of how I motivated my students was through the use of the YouTube sight word videos created by the Have Fun Teaching Channel. The sight word videos are similar to music videos for the each sight word. They have catchy melodies and lively animations. The videos require viewers to read the word on the screen in isolation, spell it out, and then use the word in a sentence (provided) within the context of

a picture. For example, the "are" video uses sentences like "Are you dancing? We are dancing! Are you singing? We are singing!" I communicated to my students ahead of time if they completed all of their work, we could dance to two sight word songs. Surprisingly, they like the sight word songs better than songs that they hear on the radio! I was surprised how motivated my class was to complete their work so that we could dance. I often caught my students singing the songs in the hallways and in the classroom. Watching my students having fun while learning made the effort worthwhile. When I assessed my students on their sight word knowledge, all but two students knew every sight word I had taught them.

Interest

After interpreting the data on the use of technology for interest purposes, I found there were fourteen times that I used the students' interests when using technology out of the eighteen lessons. Of the technologies used in this project, I used the SMARTboard, YouTube videos, graph from Teachers Pay Teachers, IXL Math, Pandora Radio, computers, and an interactive ten frame from Smart Exchange to interest the students. All of the technologies mentioned above were engaging to my students. Students expressed a desire to listen to Pandora Radio as they worked on individual or group work assignments. To increase engagement, I allowed students to choose the stations on Pandora. By letting students choose the music station, I was able to see what activities they participated in outside of the school day. For example, students have recently been opting to listen to music related to the popular movie *Frozen* and the popular hit band, *New Direction.*

To close a math lesson, I gave the students the option to do a review worksheet our Math program provided or to play an IXL game, explained below, that reviewed the same material. The students chose the IXL game on the SMARTboard. The games on IXL align with our EnVision Math Program. When we were learning about comparing shapes and categorizing them, the students were able to play a game that addressed those skills. The students were given a choice of four shapes with the question, "Which one does not belong?" Of the four shapes, one of them was a different color, size, or shape. The students needed to look for the common pieces of the shapes given and eliminate the different one. The worksheet had a similar approach. However, the students' only task in organizing the information was circling the shapes on the paper. In the game, the students were able to select the shape that did not belong and drag it away. If the student chose correctly, the game applauded and gave words of positive reinforcement such as "Wonderful" or "Brilliant". If the student was incorrect, the game brought up a page that showed the question, what the student answered, and the correct way to solve the question. If the student could read the screen, he or she could click on a volume button and the game would read the words to them.

This experience connects to Suh and Gerson's (2013) ideas about interactive feedback explained in the literature review of this study. My students needed to have immediate feedback to quickly correct or applaud their efforts. Since the game was created to give immediate feedback, my class's understanding of the topic was enhanced. If we used the worksheet instead, the students would have been relegated to waiting for me to get around to their seat to check their work. By the time I get to some students, they may have been waiting for five minutes, and their concentration on the topic is

potentially lost. The game offered immediate feedback that the worksheet could not. Feedback in the pencil and paper approach takes significantly more time than feedback from the technology.

Reviewing Material

During the eighteen lessons, I used technology to review content material fifteen times. The technologies used to review material include: YouTube videos, graph from Teachers Pay Teachers, the SMARTboard, Smart Exchange, CD player, Pearsonsuccessnet.com, IXL Math, and an interactive ten frame. On November 3rd, 2014 I noted that I used the Interactive Ten Frame from Smart Exchange. The interactive ten frame had appearing and disappearing counters that would fill in the frames when touched. When a student touched a frame on the ten frame, a counter would appear. If the same frame were touched once more, the counter would disappear. The interactive ten frame allowed students to create new problems for finding answers to one more/one less and/or two more/two less questions. The hands-on approach that the ten frame required was helpful to the students when learning this concept. The students were extremely interested in the appearing/disappearing counters.

Another case where review has been explicitly used with technology was when the class was reviewing sounds that letters make. A YouTube video on November 5th, 2014 was used to review the letter "p" and sound /p/. The production of the /p/ was exaggerated so students could specifically hear how the letter sounded by itself and within the context of a word. The video also gave direct guidance about how to pronounce the /p/ sound, skywrite the letter in the air, and different words that begin with the letter "p". These videos aid students and help them to be able to begin to make

connections between letter name and sound. The review of these letters with song greatly increased my students' understanding. The songs are catchy and have a similar structure for each video. When comparing a teacher holding up a card with the letter "p" saying "This is the letter p, the letter p says /p/"; and a song with a chorus repeats with an energetic melody that directly teaches the same skills; the song is much more appealing.

Pearson Success Net is used in my classroom for math instruction and review. It is the online access part of our EnVision math program. I am able to access videos that compliment each math topic and daily lesson to be projected on the SMARTboard. The videos have characters that move around and talk to the students. In each video, the narrator directly introduces new vocabulary terms with accompanying pictures for additional understanding. The videos pose questions for the students to answer that require lower and higher-level thinking. I am also able to download copies of the worksheets for students to have in front of them. Both the students and I can manipulate the worksheets with the styluses from the SMARTboard. My students find these videos very entertaining. The beginning of each video is a short melody with a fish jumping out of the water. My class knows to sit down quietly and be ready to learn when the music of the video begins. Pearson Success Net is extremely beneficial for my students' learning. The structure of the experience is effective in helping students learn the lesson. As stated in chapter three, this is the first year I had a SMARTboard. When comparing the previous year's learning with the current year's learning in math, I saw an increase in understanding. I cannot help but believe the SMARTboard's ability to project and manipulate our math worksheets and videos have positively impacted student success in the classroom.

Professional Development

The data collected in the six-week period concerning professional development is interesting. I was shocked to see that even when I had specifically asked for professional development on the SMARTboard in my classroom, I was told that the department chair of the Technology Department was attempting to locate someone to train teachers but was unsure of the likelihood of it actually occurring. Therefore, I was left in the position in having to pursue some "personal professional development" and conduct my own research into how I can effectively incorporate more technology within the classroom.

During the data collection period, I looked at many different websites independently to gain professional development in the areas of technology and classroom management. On my own initiative, I heavily explored Smart Exchange. Smart Exchange is an online portal filled with thousands of lessons or materials that can be used on the SMARTboard. I thought that Smart Exchange was a good place to start since I was at a loss as how to use my SMARTboard. The website offers lessons from Prekindergarten to twelfth grade in all content areas—including classroom management for routines and procedures. From Smart Exchange, I was able to effectively use a lesson with an Interactive Ten Frame as well as timers that are more interesting than just a digital clock. These items, among the many others that exist, add an engagement factor that traditional books, paper and pencil do not provide students.

Also during the data collection period, I had the opportunity to become proficient in three different technologies. A member of the Technology Department trained me for thirty minutes on the Hatch software that is currently installed on the SMARTboard in my classroom. The Hatch software is mainly used for Early Elementary students.

However, when analyzing the material, I felt as though the software was too easy for my Kindergarten students. Most of the programs already installed on the SMARTboard focus on the skill of 1:1 correspondence. This skill is something that my students have mastered. For this reason the programs installed would work better for a prekindergarten classroom.

I was also trained for twenty minutes on IXL Math. This is a website that works on specific Math skills. The games are not distracting, but to the point. These games are geared for students learning math skills, not to simply play games. The games are interactive, fun and time effective, without being overly stimulating. I believe that these games work well for my students because they are graduated in difficulty; they start out simple and incrementally become more difficult. The program provides practical questions depending on the topic. Personally, I like this website because the site addresses most of the topics we cover in kindergarten in game format. The website topics align to the Common Core State Standards for kindergarten. I can use this as a review model or for a student who needs some extra practice. This website also allows students to create profiles which then sends me an email each week of their progress. This is a great tool for teachers to monitor the progress of their students in an efficient way.

Lastly, I was trained for thirty minutes on CCC Success Maker. CCC is also a computer program that helps students with specific reading and math skills. On this website the teacher creates an account for each student in the class. The teacher can then have each student focus on specific skills giving him or her certain assignments to complete. CCC also gives the teachers a progress-monitoring tool. I found this piece of

technology to be more time-consuming than the others. I tried it with one student to see how the program worked. For one student, the program took a while to set up because the student needed to work on multiple skills. Also, many of the assignments were too hard for kindergarteners. The process took fifteen minutes to set up the account because I had to go into many of the skill topics to see if the games/tasks were appropriate for my student. CCC Success Maker is primarily used in my building for first grade students and above. If I were teaching a higher grade, I am sure this resource would be more beneficial and time efficient.

As for the professional development information that I received from the technology department, our district of Appleton has not had much professional development concerning technology within the last five years. The head of the department suggests that since they are severely understaffed in the technology department, they have not had time to provide any specific sessions that would only concern a handful of teachers. However, the department head did report that some of the members of the department had facilitated a workshop on Microsoft Office last summer. The last major district-wide professional development session was when the district switched over to Power School for the student management program that every teacher in the district uses every day. Tools without training make effective implementation difficult.

Factual Information

In a large district, with many resources, one may wonder why all teachers have not been trained in SMARTboard technology and programs. The answer: not all classrooms have SMARTboards! The following figure (figure 4) illustrates the different

types of technology the district has to offer and in which grade level and building they are located.

School	Type of Technology
Elementary School (Prek-5)	• Mimio Teach Interactive White Board with CASIO Laser Projector ("Lamp Free") • Document Camera • Flat Bed Scanners (Where requested) • Special Education Rooms and 2 Kindergarten Classrooms: Hatch SMARTboard with Early Elem. Software
Middle School (6-8)	• 60" LED TV connected to computer • Wireless keyboard and mouse (12:1:1 rooms have SMARTboard with variable height control) • Math: ○ Mimio Teach Pad with CASIO Projectors

High School (9-12)	• Science: SMARTboard
	• Math:
	  ○ Mimio Pads and CASIO projectors, wireless keyboard, and mice
	• Social Studies, Foreign Language, English, & Art:
	  ○ 60" LED projectors, wireless keyboards, and mice

Figure 4. District Wide Technologies. This figure illustrates the different technologies available to teachers and the location of those technologies within the Appleton Central School District.

This information shows what technologies are available in the ACSD across buildings. When analyzing this information, I looked at what the benefits would be if each classroom had access to all of these tools. For example, not all classrooms in the elementary school have document cameras. A document camera would be effective for directly modeling the procedure for a math problem step-by-step or marking up the text for a close reading. These are methods the SMARTboard cannot do unless the teacher has a digital copy of the worksheet or paper given to the students. There is a benefit for students to see the actual paper that is in front of them being marked up or worked on.

From the information of what technology tools are available for teachers in the ACS district, I was able to obtain the yearly budget of technology purchases. In Appendix B the breakdown of the yearly budget (2013-2014) for technology purchases is explained. The information from the budget surprised me. When I think of using technology within the classroom, I do not think of the little things that were included within the term technology. I was merely thinking of items such as the SMARTboards, document cameras or TVs. I was not thinking of toner, the district's network server, printers, or even some of the software that is used throughout the school year (Accelerated Reader, our district's email provider, and/or the benchmarking systems for reading). More money and time goes into the technology department than one would think. Also, looking at what the district spends money on makes me, as a teacher, want to be able to make more use of the available material.

In summary of the findings, I found the themes of motivation, interest, and review of content to be the guiding elements of my use of technology in the classroom. For some students, technology is a great motivational tool. Technology can be used to lock in a student's interest in an activity or to motivate him or her to complete work. Reviewing material can also be engaging and interactive when technology is involved. However, none of these statements can be supported unless the teacher is trained and feels comfortable with the technology in his or her classroom.

Chapter 5- Conclusions

From this research on technology in the classroom, I am able to draw several conclusions that will help benefit me and other teachers in the educational profession. The purpose of this project was to investigate how one kindergarten teacher uses technology within the classroom. I found that teachers can integrate multiple forms of technology into the classroom throughout the course of a school day. Technology can be used to aid in learning, but also to motivate and interest students. Teachers cannot always rely on their technology department for training but can research on their own. When I researched on my own, I was able to find many resources to use within my classroom online.

Teachers Can Integrate Multiple Forms of Technology in the Classroom

During this research project, I was able to see how many different forms of technology I use on a daily basis in the classroom. The data showed that I used ten different forms of technology during the times I was recording information. This data does not include the technology tools that I used throughout the rest of the day, outside of the specific times I was using for research. The technology I used during the recorded time included SMARTboard, www.pearsonsuccessnet.com, www.teacherspayteachers.com, www.youtube.com, CD player, Waterford Early Learning Program, IXL Math, Pandora Radio, Smart Exchange, and CCC Success Maker. All of these tools have enhanced my teaching and students' learning. When beginning to use technology in the classroom, I would suggest integrating one form of technology at a time and learning how to use the tool until the tool is mastered. After a teacher achieves a comfort level with technology then more forms of technology can be

introduced into the classroom (Puckett, 2013). The interactive element of technology hinges on the technological tool's capacity to provide accurate sequencing of concepts, instant gratification, and presentation of information. This interactive element was found to be important, specifically to skill based review applications that motivate young learners to complete work.

Technology Can Be Used to Educate and Motivate

From my classroom observation, I noted that I was using technology for educational reasons and motivational reasons. The technologies I used could be integrated into any content area for either of the two reasons listed above. The students in my classroom respond positively to the use of technology. Technology is new and exciting to my students and they will work harder when able to use technology. For example, computer time motivated students to work to their best ability and complete tasks in a timely manner. Technology can also help students learn a difficult concept in a different context. The hands on approach of most technologies add another dimension to the students learning and understanding. Some students learn better with a multimedia approach. Whether addressing the way students learn or how the teacher uses technology, the use of technology can be fully justified in the school setting. Intrinsic motivation, extrinsic motivation, and curriculum content guide my instruction. From my experiences, I know that students need instant feedback, interest, and the desire to succeed in the topic to become intrinsically motivated and independent with digital learning systems/technology as well as tasks that do not depend on technology (Moldovan, 2014). All of these pieces together formulate a cohesive HEAT lesson plan (Tassell et. al, 2013).

Teachers May Need "Personal" Professional Development

Successful integration of technology into the culture for learning requires a sense of comfort and pedagogical security both with technology and the developmental needs of students. Specific or specialized professional development is not always readily available for teachers. Workshops on technology do not always make it to the forefront of professional development ideas; whereas, training on Common Core literacy and math take up a majority of district resources. If a teacher has a SMARTboard in his or her classroom, but does not know how to effectively use the board, then the tool becomes ineffective (Puckett, 2013). However, a lack of expertise does not mean that the teacher cannot go out and seek professional development to fit his or her needs. Researching the topic you wish to know more about is possible and can be independently. On my own, I was able to find many tools and techniques pertaining to technology use in the classroom that I put into effect the next day. I might be waiting for a while if I wait for a professional development session to come about concerning technology. Conducting your own research allows you to really dive only into the topics that you want to learn about. Independent research also allows the teacher to seek specific tools for differentiation. To this end, comprehensive professional development through the technology department, grade level teams, and time for planning and integration with colleagues is an essential component to integrating technology into the classroom.

Teachers Can Find Many Resources Online

As I stated above about conducting "personal" professional development, I was able to find new information regarding technology that I did not know before. Specifically, I was able to find many new ideas for my SMARTboard on Smart

Exchange. Developing materials independently is not always necessary to create lessons or games for class instruction. Smart Exchange is a free website with many tools that teachers can download and use instantly. There were tools on Smart Exchange for taking attendance, math lessons, reading lessons, and behavior management. The possibilities are manifold. Many of the lessons on Smart Exchange can be very beneficial to students with disabilities. Students with disabilities may need the hands-on or direct modeling approach that the Interactive Whiteboard, tabletop, or computer software program can offer (Volpe et. al, 2011). Many lessons on Smart Exchange are perfect for small group intervention instruction that some students need in order to succeed.

Implications

Throughout this research project, I found two implications for further teaching. The implications will be guiding my further teaching as well as other educators. The implications revolve around looking within and beyond the school district. In my experience, I found it beneficial to investigate what technologies are offered within the district since there are so many that teachers may be unaware of. I also found it beneficial to search beyond the district; specifically on the Internet for technology resources since there are so many already created online.

Looking Within the District

In my experience I have found that teachers need to investigate what technologies are offered in their district. Although my district may not offer many professional development sessions on technology, the district does have a large technology budget. I asked the technology department for the portion of the District's budget that concerns technology. I was surprised to see that I was not using the

subscriptions for which the district has paid. For example, the district is paying for a subscription to www.superteacherworksheets.com. In a brief conversational survey of other teachers, I noted how few were aware of this type of technological tool. Technology can be an underutilized resource when the teachers are unaware of available materials.

An excellent example of an underutilized resource is the document camera. The district also has several document cameras. These are cameras that capture and project images on the SMARTboard in real time, which are available for teachers to use in their classrooms. I will be looking into acquiring a document camera for my kindergarten class. I found that being proactive in seeking technological items is more beneficial than going on thinking that there are none available. The use of the document camera will allow me to enlarge any worksheet that is not in digital format or task for my students to see well. Using the document camera will allow my students to see me work through step-by-step problems. Through direct modeling, student confusion will decrease as they see me model what is expected of them. I would like to create a presentation based on my experiences and this study that could be offered as a professional development opportunity for other district teachers. In this way the district's money is being used effectively and I am taking advantage of this of this valuable resources available in this district.

Looking Beyond the District

Smart exchange, as previously mentioned, is a great tool that I am planning on implementing more in day-to-day lessons. The lessons available on Smart exchange are aligned with the Common Core State Standards as well as our reading and math series

programs. Smart exchange would mostly be used for expanding on an already developed lesson and reviewing a topic. Currently in my classroom, we are working on formulating complete sentence structure. On Smart exchange, there is an interactive lesson where students can manipulate the words on the SMARTboard in order to create a complete sentence. Activities like this immerse students in the content, and allow them to have fun along the way. Because a majority of these activities are hands-on, students are able to solidify their grasp of the learning, as they interact with the content.

Final Thoughts

In conclusion, this research project opened the door into the world of technology and how to use it effectively in the classroom. As our district continues to increase the amount of technology available, to teachers and students, the possibility of having one-on-one technology may increase teacher effectiveness and improve outcomes and improve student growth. Technologies are ever revolving, and no single district has access to all technologies. There are an overwhelming number of exciting possibilities with technology. An example of this would be iPads. The ability to have individual iPads could unleash many opportunities for students, and allow teachers to track progress of students conveniently on a wireless device. The opportunities are plentiful with the advancing field of technology. With continued access, we will continue to see how our students grow with this technology and how it will impact the world of education.

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Appendix A

Teacher Lesson Plan

Content: _____

Topic: _____

Lesson:

Type of Technology Used:

Was the Technology planned used: Yes No

Appendix B

2013-2014 Technology Budget for Appleton Central School District

Equipment A.50.2630.2200.0000

	Descriptions	Units	Cost/unit	Subtotal
Computers	Refresh Computers	250	$550.00	$137,500.00
Monitors	Replacement Monitors	250	$125.00	$31,250.00
Servers	Host Servers	2	$7,000.00	$14,000.00
Storage Array	Storage Backup	1	$12,000.00	$12,000.00
Wireless Infrastructure	Cisco Access Points & Lic.	25	$800.00	$20,000.00
Mimio Teach	ES B&C Wings	14	$1,000.00	$14,000.00
Projectors	ES B&C Wings	14	$1,000.00	$14,000.00
Hatch Board	Early El. 12-1-1 Classroom	1	$8,000.00	$8,000.00
Classroom Printers	Lexmark MS310	30	$500.00	$15,000.00
Classroom Projection	HS Classrooms 2nd Floor	5	$1,000.00	$5,000.00
	Category Subtotal			**$270,750.00**

Supplies A.50.2630.4500.0000

Printer Cartridges	Toner and Printer Parts	1	$30,000.00	$30,000.00
Computer/Network/office	Other Parts	1	$8,000.00	$8,000.00
	Category Subtotal			**$38,000.00**

Software	A.50.2630.4600.0000			
Network Level Software	Novell	1	$8,500.00	$8,500.00
	VM Ware License	1	$6,000.00	$6,000.00
	Symantec Backup Windows	1	$0.00	$0.00
	Solar Winds	1	$900.00	$900.00
	Microsoft OS Volume License*	1	$12,000.00	$12,000.00
	Sesam Backup Novell	1	$4,000.00	$4,000.00
	Sophos	1	$15,000.00	$15,000.00
	Gwava / Retain	1	$4,000.00	$4,000.00
	Network Subtotal			**$50,400.00**
District Admin Software	NetOP	1	$610.00	$610.00
	Trustwave (Web Filter)	1	$8,500.00	$8,500.00
	Admin Subtotal			**$9,110.00**
Classroom Level Software				
Elementary Software	STAR Early Literacy	1	$3,400.00	$3,400.00
	Accelerated Reader	1	$9,000.00	$9,000.00
	Waterford Maintenance	1	$4,000.00	$4,000.00
	Success Maker Maintenance	**1**	**$4,000.00**	**$4,000.00**
	IXL Math	**1**	**$1,800.00**	**$1,800.00**
	Super Teacher Worksheets	1	$350.00	$350.00
Middle School	Brain Pop	1	$2,000.00	$2,000.00
High School	Ag Science Library (Caert)	1	$1,000.00	$1,000.00
	Auto Desk (Auto Cad / Animation)	1	$5,500.00	$5,500.00
	Easy Bib	1	$300.00	$300.00
	IXL Math	1	$300.00	$300.00
Cross Grade Level				
	Scholastic Math Inventory (SMI)*	1	$17,165.00	$17,165.00
	Scholastic Read180 upgrade *	1	$19,000.00	$19,000.00
	Castle Learning Online	1	$4,320.00	$4,320.00
	Facts On file & World Book	1	$3,000.00	$3,000.00
	Career Cruising	1	$1,600.00	$1,600.00
	SRI & Read180 Maint.	1	$4,000.00	$4,000.00
	Music Studio	1	$900.00	$900.00
	Curriculum Software Subtotal			**$81,635.00**
	Software Total Service Cost			**$141,145.00**

Contractual	A.50.2630.4000.0000			
Recycling	Hardware Recycling	3	$500.00	$1,500.00
Road Runner	Internet Connection ???	12	$1,500.00	$18,000.00
	Contractual Total			**$19,500.00**

Technical Support	**Misc. Tools and Supplies & Services (No change)**			
	.0012 (Tech Service)			
Technical Support	Equipment A.50.2630.2200.0012	1	$3,000.00	$3,000.00
Technical Support	Supplies A.50.2630.4500.0012	1	$5,000.00	$5,000.00
Technical Support	Contractual A.50.2630.4000.0012	1	$2,000.00	$2,000.00