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The Impact of Specific iPad Applications on Phonics Instruction in Kindergarten Students

Abstract

This research study determined if four iPad phonics applications had an impact on phonics acquisition in kindergarten students. This study concluded that the phonics iPad applications used in this study proved neither more nor less effective than the phonics iPad applications set in place by the classroom teacher. Data was collected through assessments, observations, and interviews with kindergarten students and their teacher. Based on the results from this study, no definitive difference was found between the four iPad applications and the iPad applications already set in place by the classroom teacher. The use of iPad applications should be considered when implementing phonics instruction for kindergarten students.

Document Type

Thesis

Degree Name

MS in Literacy Education

Department

Education

Subject Categories

Education

The Impact of Specific iPad Applications
on Phonics Instruction in Kindergarten Students

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Submitted in partial fulfillment of the requirements for the degree

M.S. Literacy Education

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May 2012

Abstract

This research study determined if four iPad phonics applications had an impact on phonics acquisition in kindergarten students. This study concluded that the phonics iPad applications used in this study proved neither more nor less effective than the phonics iPad applications set in place by the classroom teacher. Data was collected through assessments, observations, and interviews with kindergarten students and their teacher. Based on the results from this study, no definitive difference was found between the four iPad applications and the iPad applications already set in place by the classroom teacher. The use of iPad applications should be considered when implementing phonics instruction for kindergarten students.

The Impact of Specific iPad Applications on Phonics Instruction in Kindergarten Students

The area of phonics instruction serves as a basis for emergent learners, which begins with letter recognition. Phonics refers to “an instructional approach that focuses on the systematic relationship between letters and sounds, and how sounds map to letters to form words” (Lane & Pullen, 2004, p. 157). Letter recognition refers to a child’s ability to identify the 26 characters of the alphabet, including all sounds associated with those characters (Fountas & Pinnell, 2008). Once a child has mastered basic letter-sound correspondence, he/she will begin to learn connections among letters and sounds within words. Mastery of letter recognition requires students to absorb a plethora of knowledge in a short amount of time, leaving some struggling to learn necessary phonics instruction.

In an effort to help struggling learners in the area of letter recognition, the implementation of new literacies, such as the iPad, have been put forth as a solution. As a method of determining the impact iPads have on letter recognition in an emergent setting, research will be conducted to conclude the iPads relevance as a source of greater understanding for letter recognition. This research is important because the outcome determined the benefit of iPad applications as a tool for students learning letter recognition. With this information, educators can seek out ways to incorporate iPad instruction into their phonics lessons. As a result of this research, students and teachers will benefit from this topic. Teachers will be able to use this information in their lessons as a way to increase their students’ knowledge of letter recognition. The research from this study would benefit students as well because students that may have struggled with this type of phonics instruction in the past would be able to try a new method of instruction. If this research was not conducted, teachers would continue to use methods of phonics instruction that might not meet the needs of their students. Students would therefore struggle to create the necessary building blocks of phonics instruction.

The purpose of this study was to determine if specific phonics iPad applications were more effective than the literacy iPad applications already set in place by the classroom teacher. The use of technology in schools reflects the new literacy theory based on the opportunities students are presented with through technology. The iPad is one of the ways that classrooms can provide students with this type of learning experience. Research explains that iPad use for phonics can be beneficial when used to supplement teaching as opposed to replacing it. Through observations, interviews, and data assessments it was concluded that the phonics iPad applications used in this study proved neither more nor less effective than the applications set in place by the classroom teacher. Based on these findings, there are many implications that teachers should consider when using iPads.

Theoretical Framework

The definition of literacy has become more intricate with advances in education, technology, and communication. Cohen and Cowen (2010) define literacy as “a complex, multifaceted process that requires a wide variety of instructional approaches” (p. 6). A more in-depth look at this definition explains that students need to explore new literacies as a means of acquiring knowledge and useful understandings that are relevant to everyday life. Technological literacy is a form of literacy that should be included in education among students because of the social aspects that students can benefit from with this type of learning. Some of the skills that are included in technological literacy include information and communication skills, thinking and problem solving skills, and interpersonal, and self-direction skills. These skills lead students to becoming independent learners, by allowing technology to become the instructor and students to become more self-motivated. Through technology, students are able to acquire learning

through new opportunities and different methods of social learning experiences. Furthermore, this type of literacy includes the use of hypermedia, which is described by Cohen and Cowen (2010) as approaches that “combine on-screen text with pictures, animation and graphics, and increasingly sound and video” (p. 5). Technological literacy gives teachers more opportunities for differentiated instruction because there are more methods of literacy instruction available. With this type of literacy available, students can learn to define literacy through alternative paths that meet the needs of their educational experience. These different skill areas incorporate modern technological literacy that children need to develop in order to function in a technology driven society.

Technology impacts the acquisition of literacy in the classroom through the constant changes and advances it encounters. For every new technology, new literacy emerges because each technology changes how literacy can be used. Technology changes what people can do, how they communicate, how they think, and how they read and write. Baron (2001) explains different pieces of technology and how over time the different advances in technology have impacted the way people communicate in a literate society. For example, the pencil changed the way in which we communicated. Before this writing device, communication was verbal. With this advance in technology, people were now able to express themselves through a new literacy called writing. The computer is another technology that impacted literacy acquisition (Baron, 2001). This invention was originally for the use of intense calculations that were too complex to do by hand. As this technology developed, it became a tool that is a means of creating and communicating literacy. A more recent form of computer technology is the use of tablets, specifically the iPad, which has opened up the world of education even further through the use of applications that students can use to meet their specific needs in different areas of learning. The

IPad also gives students a new method of instruction that allows them to interact in a different social context. With these changes in technology, new classroom activities and instruction can be included in curriculum and change the way students look to literacy as a means of learning.

Furthermore, Otto (2008) discusses some of the reasons that oral language aids in the development of literacy among children. A child's phonetic knowledge of language is one way in which oral language develops, because children begin to distinguish sounds as young as two months old and begin to reproduce the sounds they have discovered. Children pick up on this phonetic knowledge through the use of language in the home setting and their surroundings. Another concept that children are able to grasp is prosodic features, which is the use of tones in oral language. Once children reach an academic setting, they begin to connect their social discoveries of oral language to explicit teaching methods of these phonics skills. This area of phonics includes the knowledge of letter recognition, which is the basis for language acquisition among children.

Acquiring phonics skills, specifically letter recognition, is a necessary building block for students. With new technologies, such as the iPad, in many classrooms, it is essential for teachers and students to implement these resources to benefit student learning outcomes. New literacy studies supports this claim, because it explores the use of literacy by means of new technologies. New literacy, proposed by Street (2003) defines this theory as "focusing not so much on acquisition of skills, as in dominant approaches, but rather on what it means to think of literacy as a social practice" (p. 77). New literacy is the concept that students will achieve higher levels of thinking through the practice of social literacy, rather than explicit teacher instruction of methods that have been commonly used by educators. Street (2005) further explains that "the ways in which teachers or facilitators and their students interact is already a social practice that

affects the nature of the literacy being learned” (p. 418). With new literacies, teachers and students explore ways for students to use and benefit from new approaches for instruction. This theory relates directly to how students will acquire letter recognition, because the method of instruction is a new approach of social interaction among education. Based on the new literacy theory, language acquisition among students depends on the approach in which they are being instructed, and to what degree the instruction is considered a non-dominant practice. Furthermore, literacy practices are constantly changing, which will require educators to be flexible in their methods of instruction. Overall, new literacy is a more complex means of acquiring language that requires multiple social practices within a specific means of instruction that reflect that complexity.

Research Question

This research topic will explore a new method of phonics instruction, the iPad, and how this type of instruction helps students with their development of letter recognition. Given the new advances in technology and that new literacy is a means of acquiring language through a variety of instructional approaches, including new technology, this action research project asks, how do iPad applications increase kindergarten students’ knowledge of phonics, specifically letter recognition?

Literature Review

This literature review will explore how technology impacts literacy instruction. There are many factors that influence technological literacy as a means of classroom instruction. First I will explore the different types of technology that reoccur throughout various studies. Next, I will explore the impact that new technology has on teachers. Then I will discuss the idea of technology integration in the classroom can foster literacy development in students.

Additionally, I will explain the impact that interactions with technology can have on low performing students and their literacy gains. Furthermore, I will discuss the different types of phonics instruction and their benefit for learners. The research shows that the use of technology aids in student development, specifically low performers, in the area of literacy instruction.

Instructional Technologies

With many recent developments in technology, it is important to explore the technologies that are being used in classrooms currently. Computer assisted instruction (CAI) is a term used to define the integration of computer use into the classroom instruction experience (Chen & Couse, 2010; Macaruso & Walker, 2008; Macaruso & Rodman, 2009). There are many different kinds of programs available that offer new technology tools in an educational setting. Across vast areas of instruction, CAI allows for students to work independently in their instructional practices, using programs that range from emergent levels to secondary, based on student needs (Macaruso & Rodman, 2009; Macaruso & Rodman, 2011). Additionally, information and communication technologies (ICT) refer to the source of technology that information is obtained from (Kervin & Mantei, 2010). Some examples of this type of technology include email, instant messaging, internet searches, podcasts, and the use of presentation tools. A new form of technology that has become an area of interest is the use of the iPad as an instructional tool (Murray & Olcese, 2011). The iPad is a computer tablet that offers the use of different applications that are categorized to use specifically for educational needs. Prior to implementing instructional technologies, it is important to understand what research shows about the impact technology has on student learning.

As instructional technologies are making their way into classrooms, it is essential to explore how it's used, and if these methods are effective for instruction. Judson (2009) looked at fifth and eighth grade students to identify a link between technology literacy and achievement in reading, mathematics, and language arts. It was determined that technology literacy and gains in language arts are interrelated, which provides a basis for instruction. Macaruso and Rodman (2009) prove this correlation is valid based on a study conducted with middle school students that struggled in language-based reading curriculums. Students used a CAI program that used phonics and word identification skills to support their learning, which resulted in significant gains among those areas. Additionally, extensive studies have been done to determine if instructional technologies aid in phonics growth among emergent learners.

In an effort to determine the effectiveness of CAI, Connell and Witt (2004) studied the use of computerized methods of instruction to yield advances in language arts for kindergarten students. Specifically, if students were taught to match uppercase and lowercase letters to their letter names, would they then be able to match uppercase and lowercase letters to one another without further instruction. The results of this study showed that the use of computerized methods can advance language arts instruction, specifically in the area of phonics. Similarly, Macaruso and Rodman (2011) conducted a study with pre-school students to determine if CAI would enhance student learning in the area of phonics. This study was based on prior research which determined that CAI had a positive impact on students' phonological awareness skills (Macaruso and Walker, 2008). Students were introduced to the computerized instruction, and then required to work independently using the phonics software. The results proved CAI as an effective tool for improving phonics abilities in students, therefore matching those of Connell

and Witt (2004). Based on these findings, the trend of instructional technologies proves its effectiveness of instruction in language arts, specifically phonics.

Similar results deemed true for instructional technologies through the use of writing. Voogt and McKenney's (2007) method of research is comparable to Macaruso and Rodman (2011) and Connell and Witt (2004), in terms of introducing the technology to students, and then requiring independent use without teacher direction. As a result, emergent reading and writing skills were improved through the use of computer software programs (Voogt and McKenney, 2007). Instructional technologies have proven effective in areas other than basic language arts skills. Couse and Chen (2010) discuss the use of drawing in pre-school classrooms as an instructional technology through the use of a tablet. This study showed that students who used the tablet to draw a self-portrait produced drawings that were above expectations in comparison with their prior work and work of other students in the class who used traditional drawing tools. After looking into how various instructional strategies are compatible through the use of technology, it's important to explore how teachers can become effective in implementing this type of instruction.

Teachers and Technology

With the variety of instructional technologies available, teachers need to explore what their needs are for implementing technology into their instruction. There are many different factors that influence teachers' technology use in the classroom. Some of those factors include support from school administration, collaboration among co-workers, and availability of school resources (Chambers, Slvain, Madden, Abrami, Tucker, Cheung & Gifford, 2008; Davies, 2011; Kervin & Mantei, 2010; Mouza, 2002/2003; Polly, 2011).

School administrators play a major role in technology instruction in the classroom. The job of school administrators is to provide teachers with “an environment that supports continuous professional growth” (Mouza, 2002/2003, p. 274). One way that administrators can provide teachers with this kind of support is through professional development sessions. Professional development in the use of technology needs to emerge, so that teachers can begin to effectively use the resources available for them. Mouza (2002/2003) explains that most school districts have been distracted by obtaining new technologies and have failed to provide teachers with professional developments on how to use these new resources as a tool for effective instruction. Similarly, Polly (2011) agrees with the need for professional development by explaining that “teachers who can effectively integrate technology have a deep understanding of technology, pedagogy and content” (p. 950). Specifically, in order to successfully integrate iPads, teachers need to commit to using iPads “as more than just a device with a lot of apps” (Herlihy, 2011, p. 15). Teachers need to learn how they can use iPads as an effective tool for instruction, different from current methods. Moore-Hart (2008) also supports this claim stating that teachers need support and training to comfortably integrate technology into daily activities. In a study performed by Polly (2011), professional development activities were provided for teachers in a five day technology camp, which required teachers to use various technological tools and brainstorm how these resources can support learning in the classroom. The year after this professional development took place, technology implementation increased in classrooms; however, the method of using the technology tools did not depict higher- order thinking for students. Similarly, Bennett (2011/2012) explains that teachers need to “think outside the app,” meaning that the applications on iPads don’t always provide higher-level thinking and teachers should consider supplemental learning (p. 24). Furthermore, Blagojevic (2011) discusses a

district that provided all kindergarteners with iPads. To supplement this change, teachers were provided with the necessary training to ensure success. The training that teachers were given included professional development sessions, research to help teachers determine if students are meeting goals, and technological training demonstrating how to purchase, manage and sync applications (Blagojevic, 2011). In order for teachers to plan lessons that effectively include technology and more complex understanding, collaboration across a district needs to take place.

Collaboration is essential in an educational setting, because it allows teachers to share ideas, strategies and valuable tools for teaching. The main goal for any teacher should be in the best interest of their students and the methods of instruction that provide students' with effective instruction. Polly (2011) found that collaboration activities gave teachers a sense of direction for their curriculum planning in the year to come. To establish this plan, administrators, literacy facilitators, and technology facilitators met to motivate teachers in developing a design for technologically effective classroom instruction. This type of collaboration allowed educators in different fields to combine their knowledge and provide students with a collaborative, technology-rich literacy learning environment (Polly, 2011). Additionally, Mouza (2002/2003) discusses the importance of collaboration in different areas of instruction within the school to effectively implement instruction. Mouza's (2002/2003) study demonstrates the differences between colleagues who collaborate and those who do not. It was found that teachers who shared more supportive relationships with colleagues were more apt to use technology that benefited student learning. Blagojevic (2011) supports the idea of collaboration, explaining that in a district where all kindergarteners are provided with iPads, teachers will receive additional support. The support that these kindergarten teachers were given included time blocks for collaboration, planning, and discussion, which allowed teachers to "network, ask resource people

specific questions, and learn together” (Blagojevic, 2011, p. 5). Teachers need to work together to provide students with instructional technologies, especially in environments where these resources are scarce.

Given the importance of instructional technologies, teachers can face obstacles based on the availability of resources. Davies (2011) explains that lack of available resources or funding can prevent the use of technology in the classroom. Teachers need to first examine what resources they have available at their school, so they can then develop meaningful lessons that implement these tools for instruction. Couse and Chen (2010) express how one teacher discovers the use of tablets as a tool to develop better outcomes for students in drawing. Similarly, Mouza (2002/2003) shows how one teacher reaches out to the art and technology teacher to see what resources are available that can support student learning. Furthermore, Bennett (2011/2012) states concerns that a limited number of iPads in her classroom would make lessons less effective. Bennett (2011/2012) found however, that “fewer iPads required innovative thinking in terms of instructional design, and resulted in excellent ways to differentiate instruction” (p. 23). For example, centers were put in place, which provided students with independent instruction that were specific to their needs. Teacher access to technological resources is critical in the implementation of instructional technologies. It’s important for teachers to evaluate the resources that are accessible as a means for instruction.

It can be concluded that the instructional technologies that are available provide teachers with new options in developing lessons. Teachers need to learn about the technology available to them through professional developments and collaboration. With this knowledge, they can effectively use different aspects of technology to develop assignments that align with the standards (Polly, 2011).

Integrating Technology and Literacy

Despite challenges that can occur when using instructional technology, teachers need to learn effective measures for integrating literacy instruction that is benefited by technology. Research has shown that technology will improve students' abilities to function in society and become abstract learners (Davies, 2011). With this knowledge of technology, integration of literacy and technology should become an integral part of classroom instruction. There are different factors to consider when integrating literacy and technology.

The effect that technology integration has on students is the first thing that teachers need to consider when implementing this type of instruction. Davies (2011) states, "the goal of technology instruction in education is the wise and competent use of technology to facilitate learning" (p. 50). Similarly, Kervin and Mantei (2010) support this claim, explaining that the key understanding of integration is that technology should not replace literacy learning and vice versa, but rather support each other in learning. Karadenzi and Demiralay (2010) also reinforce this finding through the use of ICT which allowed students to have an increased perception of their ability to understand and perform informational literacy. Additionally, Tovar, Hansen, and Puckett, (2011) emphasize this research through a study conducted on the use of technology to preform assessments with students. The tools used for assessment allowed the teacher to have faster results and therefore immediately begin implementation of new strategies. With the ability to more efficiently identify areas of needs in students, greater gains were made in the students' literacy skills (Tovar, Hansen, & Puckett, 2011). Through the use of PowerPoint, computers and podcasts, Kervin and Mantei (2010) show how technology is used in school-based projects to effectively provide students with literacy experiences. In addition to more effective methods of literacy learning, technology allows students the opportunity for independence in education.

Dubert and Laster (2011) state, “new technologies also offer promise for innovative ways to help striving readers develop skills and independence in reading and writing” (p. 23). Baytak, Tarman and Ayas (2011) support this claim based on a study that showed students were more independent when using computers. Similarly, Macaruso and Rodman (2009) explain that one of the advantages to using CAI is that “it gives students an opportunity to engage in additional, structured practice of particular skills without the need for direct supervision” (p.104). Furthermore, Bennett (2011/2012) explains how iPads provide independence for student learning, specifically when used during centers in the classroom. The applications used on iPads provide students with “scaffolded instruction,” which allows students to progress individually at an appropriate pace (Bennett, 2011/2012, p. 23). With this new independence of student learning, researchers need to explore if the information students are provided with, through the use of technology, is meaningful.

New technology, such as multimedia allows for students to learn information first hand, rather than through translation (Chambers et al., 2008). As teachers try to gain new understandings through professional developments, they then try to pass this information on to their students, resulting in loss of meaning. The use of new technologies encourages students to learn directly from the source of information, which provides more effective learning practices. Additionally, multimedia makes learning more memorable for students and allows for more thoughtful connections (Chambers et al., 2008). Similarly, through the use of PowerPoint, students showed engagement in creating multimodal texts and visuals (Burnett, Dickinson, Myers and Merchant, 2006). Additionally, there are many features that computer programs have to offer that make learning meaningful and individualized (Chamber et al., 2008). Macaruso and Walker (2008) support this claim, explaining “computers are capable of presenting activities that

are interesting and motivating to children- including the use of pictorial displays and positive feedback” (p. 268). Furthermore, Murray and Olcese (2011) argue that iPads don’t necessarily offer instruction that isn’t feasible by teachers, but children of the computer age need multimodal, visual and graphic instruction to make memorable connecting experiences. Based on this information, teachers need to establish instruction that is meeting the needs of diverse learning modalities. Murray and Olcese (2011) explain this further, stating that “the core of education—reading, writing, reasoning and computing mathematically—has not changed, how, where and why these core principles are engaged in is vastly different today than it was even a few decades ago” (p. 48). In conclusion, in order to prepare students for iPad technology in the classroom, teachers need to explore modern educational theories.

There are some factors to consider when integrating technology and literacy. It’s important that teachers are implementing effective instruction methods that meet the needs of students in literacy and in technology. Integration needs to be specific to curriculum in such a way that allows technology and literacy to support one another in instruction (Moore-Hart, 2008). Macaruso and Rodman (2009) reinforce this claim explaining that CAI programs should be used to enhance literacy instruction through integration. Similarly, Polly (2011) discusses how different technologies can be used to support specific learning concepts. Teachers need to establish the use of integration based on the specific curriculum requirements and how technology can support in superior learning outcomes.

In conclusion, technology integration provides teachers with a new instructional framework to aid in student learning. In order to properly integrate technology and literacy, teachers need to explore the different methods they can use to enhance student learning outcomes. To reinforce this concept Chambers et al. (2008) state, “linked visual and auditory

content is retained better than either type of content alone” (p. 13). With this knowledge, teachers can look to multimodal approaches of instruction through integrating literacy and technology.

Technology and Low Performing Students

Although technology integration has its challenges, the value of instructional technologies and their success with low performing students gives educators a reason to implement this type of instruction. Macaruso and Rodman (2009) support CAI as an effective instructional tool for low performers, as they explain that “lower performers seemed to benefit the most from CAI practice” (p. 109). Regardless of obstacles that technology can bring teachers, the research shows that implementing instructional technologies with low performing students will benefit students’ learning.

Instructional technologies have been proven effective for growth in literacy among students however, additional research shows the benefits of instructional technology and growth among low performing students (Chambers et al., 2008; Macaruso & Walker, 2008; Macaruso & Rodman, 2009, 2011). Phonics instruction in kindergarten was one area that low performers showed remarkable growth. According to Macaruso and Walker (2008), low performers “showed average to above-average performance in literacy skills subsequent to CAI use” (p. 280). Additionally, a later study conducted by Macaruso and Rodman (2011) yielded similar results. Low performers that used CAI showed much greater gains than low performers that did not use CAI. Similarly, Chambers et al. (2008) conducted research that showed improvement of at-risk students’ reading performance, in first grade, based on the use of embedded technology. Macaruso and Rodman (2009) researched the effectiveness of CAI in low performers at the middle school level which also concluded comparable results. It was found that CAI is

beneficial to older students who struggle in the area of reading, specifically decoding (Macaruso & Rodman, 2009). With such significant evidence that instructional technologies are beneficial to low performing students in the area of literacy, further exploration of these tools should be considered.

The variety of highly motivating graphics could explain the tremendous growth that low performing students make using instructional technologies. Baytak et al. (2011) explain that students don't view technology as educational. Therefore, when new technologies are integrated, it is intriguing and motivating to learners (Baytak et al., 2011; Moore-Hart, 2008). Furthermore, this study observed students in fifth and sixth grade to acquire information about how students perceive technology. In conclusion, "the educational value that the children gave to technology was more about the motivational factors" (Bayta et al., 2011, p.147). In a study conducted with low performers and CAI programs, Macaruso and Walker (2008) similarly found that students showed interest in CAI through the use of motivational and visual graphics, such as progress bars that fill up upon completion of activities. Shah (2011) discusses the engagement that students with disabilities show when using iPads. Additionally, one student with Down syndrome was given an iPad as a tool for communicating, which intrigued peers and gave the student self-confidence when explaining features on the iPad. Although the visuals of instructional technologies can be motivating, it doesn't explain the gains in achievement for high performers. Researchers further explore the specific aspects of instructional technologies that are impacting low performers in literacy.

There are many different features that instructional technologies offer which gives researchers a target for the specific features that are beneficial to low performing students and their large gains in literacy skills. In one study, researchers found that the program includes hints

when a student answers incorrectly (Macaruso & Walker, 2008). The hints give students more individualized instruction that is direct to their needs. Macaruso and Walker (2008) further explain the benefits of this program, because it's "especially valuable for low performers who may need significantly more practice to master a particular skill" (p. 271). With this type of instruction, students are able to spend the time they need on a specific skill and then move on once that skill is mastered. In an educational setting where the teacher serves as the only instructional method, students aren't able to receive such individualized support. Similarly, Macaruso and Rodman (2011) found that CAI programs provide students with efficient experiences that relate to their individual needs as necessary. Additionally, Foote (2010) explains that the iPad is especially beneficial for students with disabilities because it "offers great accessibility for students with physical and mental disabilities" (p.18). Furthermore, the ability to enlarge the iPad screen and fonts is beneficial for students who have struggled to read average font sizes on paper or computers in the past. Instructional technologies have shown major benefits for more efficient instruction in low performing students. This may provide implications for teachers and how they use these instructional tools to benefit learning for low performers.

After discovering that instructional technologies benefit low performing students in the area of literacy, teachers need to consider what this means for their future instruction. There are many different ways that instructional technologies can be implemented into the classroom, but teachers need to ensure that they're meeting the needs of all students. Bennett (2011/2012) and Blagojevic (2011) explain that iPad use is especially beneficial during center times because the iPads can be set up in a routine which allows students to know what they're looking for without teacher intervention. Macaruso and Walker (2008) explain that CAI doesn't have to just be used

for low performing students, because it also provides typically developing children an engaging method of learning skills that will lead to growth. It is suggested that CAI could be used as center activities for typically developing students, which would give teachers time to spend with students who need more individualized instruction and support (Macaruso & Walker, 2008). Contrary to this, Macaruso and Rodman (2009) suggest that CAI be used with typically developing students, but its primary use should be with low performing students. With this research on instructional technologies and use in the classroom, it can be recognized that teachers need to assess the needs of their students to determine an approach that will be most beneficial.

In conclusion, there are many factors that need to be considered when assessing growth in low performing students. Research shows that the use of technology aids in growth among low performing students (Chambers et al., 2008; Macaruso & Walker, 2008; Macaruso & Rodman, 2009, 2011). Further research tells us how this information can help with individualized instruction for the needs of all students developmentally (Bennett, 2011/2012; Macaruso & Walker, 2008; Macaruso & Rodman, 2008). Overall, teachers need to implement instructional technologies for low performing students in order to benefit their learning experience in literacy.

Phonics Instruction

In order to fully understand the role new technology plays in literacy development, it's important to explore the different types of phonics instruction and their efficiency. The terms most commonly referred to when discussing phonics instruction are systematic and non-systematic phonics instruction. Systematic phonics instruction refers to explicit or direct teaching of phonics, which is the relationship between letters and sounds (Mesmer & Griffith,

2005). Unsystematic phonics instruction is an implicit or indirect method of instruction that is embedded within instruction (Bos, Mather, Dickson, Podhajski & Chard, 2001; Ehri, Nunes, Stahl & Willows, 2001). With an understanding of the different types of phonics instruction, we can now look at what research says about systematic and unsystematic phonics instruction and more specifically, how technology impacts phonics instruction.

There are different points of view when it comes to research on systematic and unsystematic phonics instruction, which leaves some researchers with more questions. In two studies conducted with first grade students, researchers examined the effect of different types of phonics instruction (Kotaman, Tekin & Tekin, 2007; Rightmyer, McIntyre & Petrosko, 2006). These studies concluded that no specific method of phonics instruction is more effective after one year of instruction in first grade. Similarly, Beverly, Giles and Buck (2009) found that although phonics instruction is an essential beginning to reading instruction, no method of phonics instruction was determined greater than another. It was found that first graders are more likely to benefit from authentic literature (Beverly et al., 2009). Contrary to these findings, further studies indicated that systematic phonics instruction proved to be the most effective method of instruction (Chambers et al., 2008; Connell & Witt, 2004; Ehri et al., 2001; Macaruso & Rodman, 2011; Mioduser, Tur-Kaspa & Leitner, 2000; Swanson, 2008). Specifically, Mioduser et al. (2000) found that CAI programs that use systematic and structured phonics exercises proved more effective for preschoolers than printed-only phonics instruction. Chambers, et al. (2008) yielded similar results, in which students who received phonics instruction with explicit CAI showed greater gains than students who were not given computerized phonics instruction. Additionally, Connell and Witt (2004) found explicit CAI phonics instruction to be beneficial for kindergarten students, specifically in the areas of letter-

name and letter-sound recognition. Swanson (2008) determined that methods of systematic phonics instruction benefit struggling readers because of its' explicit approach to instruction. Similarly, Ehri et al. (2001) found that phonics instruction leads to improved reading acquisition among beginning readers, as well as in older readers with reading disabilities. Macaruso and Rodman's (2011) study also concluded that phonics instruction through the use of CAI leads to gains in word reading, spelling and text processing. The results from these studies show that systematic phonics instruction, including the use of CAI, shows greater gains for students in prekindergarten and kindergarten than a non-systematic phonics approach (Chambers et al., 2008; Connell & Witt, 2004; Macaruso & Rodman, 2011; Mioduser et al., 2000). Furthermore, other research shows that neither systematic, non-systematic or systematic CAI phonics instruction have proven to be a more effective approach, specifically for students in first grade or higher (Beverly et al., 2009; Kotaman et al,2007; Rightmyer et al., 2006). These results may conclude that CAI systematic phonics instruction is more effective for students below first grade.

Although there were different findings among the impact of systematic and non-systematic phonics instruction, this research could indicate that phonics instruction is better suited for students below first grade. Rightmyer et al. (2006), states "the answer may have more to do with the timing of children's literacy development" (p. 227). The research about systematic and non-systematic instruction would conclude that phonics instruction will benefit learning, but perhaps with younger children. Macaruso and Rodman (2011) prove this statement to be true based on their study conducted with pre-school and kindergarten students use of systematic phonics instruction through the use of CAI as opposed to first grade students. Similarly, Ehri et al. (2001) explained that "the impact of phonics instruction on reading was significantly greater in the early grades" (p. 427). Additionally, this study found that students

made gains in spelling skills in younger grades. Bos et al. (2001) also supports this claim, stating that “systematic instruction in phonological awareness and phonics improves early reading and spelling skills and results in reduction of the number of students who read below grade level” (p.97-98). Based on this research, phonics instruction shows potential as the basis for reading acquisition.

There are many different factors that are associated with reading acquisition. The most common theme discovered through this research was the impact of phonics instruction on reading acquisition. According to Ehri et al. (2001), phonics instruction aided in reading acquisition among younger and older readings, but gains in reading acquisition were significantly higher in younger readers. Similarly, Beverly et al. (2001), explains the importance of phonics as a “prerequisite to successful comprehension for beginning readers” (p. 191). This research of phonics instruction and its impact on comprehension links to reading acquisition skills.

With this research of phonics instruction, it’s important to look at what teachers know about phonics and the ways they are implementing effective phonics instruction. Mesmer and Griffith (2005) discovered that teachers favored phonics instruction that was explicit and systematic. Additionally, some teachers in this study favored systematic teaching approaches, but felt that sometimes before explicit instruction they used a non-systematic approach to have students use deeper thinking skills to determine something on their own. Based on this information, teachers should explore systematic phonics instruction through the use of CAI and iPads. The exploration of phonics instruction through technology would give teachers the opportunity to introduce phonics lessons through non-systematic instruction and then allow technology to explicitly teach and reinforce phonics skills. Chambers et al. (2008) and Macaruso and Rodman (2011) explain

how CAI is a systematic approach to phonics instruction based on the computer programs that are used in their studies. According to a study conducted by Bos et al. (2001), “knowledge of language structure questions highlights concern that recent research findings have not yet been communicated effectively to teachers” (p. 114). Therefore, this lack of understanding could explain the differences among beneficial phonics instruction and what research has shown.

It has been found that systematic phonics instruction, including the use of CAI, proves more effective than non-systematic phonics instruction in students below first grade (Ehri et al., 2001; Macaruso & Rodman, 2011; Swanson, 2008). Additionally, Mesmer and Griffith (2005) concluded that systematic phonics instruction was the favored method of phonics implementation by teachers. Furthermore, when considering phonics instruction teachers need to consider the specific needs of their students and their level of development in reading acquisition. Taking student needs into consideration would allow teachers to explore the use of CAI or use of iPads for systematic phonics instruction. These types of instructional technologies would allow for differentiated and systematic methods of phonics instruction that meet the needs of individual students (Macaruso & Rodman, 2011; Bennett, 2011/2012). Furthermore, instructional technologies such as the iPad provide applications that give students a systematic, structured approach to phonics instruction due to its definitive method of instruction and immediate feedback (Blagojevic, 2011).

It has been proven that the use of technology instruction impacts literacy instruction among students across vast levels of literacy development (Connell & Witt, 2004; Couse & Chen 2010; Macaruso & Rodman, 2011; Macaruso & Walker, 2008; Voogt & McKenney’s, 2007). Additionally, systematic phonics instruction has been proven to benefit development of phonics (Ehri et al., 2001; Macaruso & Rodman, 2011; Swanson, 2008). These findings indicate that

instructional technologies that support systematic literacy instruction, specifically in phonics, will benefit in student growth across literacy skills (Macaruso & Rodman 2011). Furthermore, researchers have proven that low performing students in addition to typically developing students benefit from instructional technologies in the area of literacy (Chambers et al., 2008; Macaruso & Walker, 2008; Macaruso & Rodman, 2009, 2011). Based on these findings, it can be concluded that instructional technologies as a systematic approach to literacy instruction are beneficial to typically developing and low performing students.

Method

Context

Research for this study took place in the Brown School District (pseudonym), which is located in a large city in Western New York. The Brown district consists of 62 schools, including pre-kindergarten, elementary and secondary schools. The enrollment for the Brown School District is approximately 31,653 students as of the 2009-2010 school year (New York Department of Education, 2010). The Brown School District is comprised of 36 elementary schools, including Armand School (pseudonym), which is where this study took place.

As of 2009-2010, the Armand School consists of 300 students, not including pre-kindergarten students (New York Department of Education, 2010). The total number of teachers in the Armand School is 19, which allows for an average class size of 19 students per grade level. Sixty-five percent of students within the Armand School are eligible for free or reduced lunch. The racial/ethnic origin of the Armand School predominantly consists of Black or African American students, making up 65% of the schools population. Additionally, the schools population includes 28% Caucasian students, 4% Hispanic or Latino, 2% Asian or Native Hawaiian/Other Pacific Islander, 1% Multiracial and 0% American Indian or Alaska Native.

This study took place in one of two Kindergarten classrooms in the Armand Elementary School. Within the Brown School District, there are after-school programs and public library systems that offer community involvement. Specifically, the Armand School offers Student Council, Lego League, Safety Patrol, Cross-Age Classroom Helpers and Reading Buddies, Horse Club, Step Team and Chess Club (*Elementary schools overview*, 2010). Furthermore, the Armand School is an Instrumental Music Magnet school, allowing the school to offer music programs that include Primary Choir and Intermediate Choir as well as Orff, D.R.U.M. and exemplary Band, and String Programs. The Armand School provides weekly parent connections that are sent out from every classroom, indicating content covered during the week and special events to link parents and the classroom on a regular basis. Each classroom also has a webpage to further unite families and the school.

The Kindergarten classroom where this study was conducted in consists of one teacher, one paraprofessional and 21 students. The demographic make-up of this classroom consists of ten Caucasian students, seven Black or African American students, two Asian or Native Hawaiian/Other Pacific Islander, two students from Nepal and one student from Thailand. Additionally, this classroom consists of three English Language Learners (ELL's). The ELL students receive ELL support. In this classroom, one student receives additional services, which include occupational therapy, speech and consultant support from a special education teacher.

Participants

In this study, I interviewed and observed Mrs. Bic (pseudonym) in her kindergarten classroom to collect information that is pertinent to my study. She has been a Kindergarten teacher in Armand Elementary School for nine years. Additionally, she has worked for the Brown School District for ten years. She is certified in Elementary Education and has been

teaching for ten years. As a kindergarten teacher, her responsibilities are to “plan and implement effective lessons in core subject areas that promote student growth academically, socially and emotionally” (Williams, 2012, p. 1).

There are six target student participants in this study. All participants are in Mrs. Bic’s Kindergarten classroom at Armand Elementary School. Every student in Mrs. Bic’s classroom is assessed using AIMSweb, which is a benchmark and progress monitoring tool that measure their literacy growth through intervention. There are three different assessments that are provided at the Kindergarten level for assessment. This includes Letter Name Frequency (LNF), Letter Sound Fluency (LSF) and Phonemic Segmentation Fluency (PSF). This assessment is broken up into targets for fall, winter and spring at each grade level. The target for students at a Kindergarten level in winter for the LNF is a score of 38. The LSF assessment targets students at a score of 20, and the PSF assessment gives a target score of 18 for students during winter.

At a Kindergarten level, Raina (pseudonym) is the first participant in this study, who is a five year old female, African American student. At this point, Raina does not receive services at Armand School. According to AIMSweb, Raina received a score of 60 on the LNF assessment, 34 on the LSF assessment and 38 on the PSF assessment in winter. These results show Raina to be above the targets in all assessment areas for Kindergarten. Raina is an outgoing student who participates consistently in lessons and offers assistance to other students in the classroom. She is an enthusiastic learner and good friend to all her classmates.

The second participant is Tony (pseudonym), who is a five year old Caucasian male in Mrs. Bic’s Kindergarten class. Tony does not receive any services at Armand Elementary school. For Tony, AIMSweb revealed a score of 68 on the LNF, 39 on the LSF and 48 on the PSF assessments in winter. These results show that Tony is above the targets in all assessment

areas for Kindergarten. Tony is reserved during classroom lessons and shows shyness towards peers. Tony participates appropriately when asked and follows the routines of the classroom consistently.

Cici (pseudonym) is the third participant in this study. Cici is a five year old Caucasian female who does not receive any services at Armand Elementary School. The results from AIMSweb in winter for Cici revealed scores of 61 on the LNF, 26 on the LSP and 41 on the PSF. This shows that Cici is above the targeted level for students at the Kindergarten level in Mrs. Bic's classroom. Cici shows enthusiasm for learning and is well acquainted with her peers. Cici shows some shyness during classroom instruction, but is comfortable within the classroom environment.

The fourth participant in this study is A.J. (pseudonym). A.J. is a five year old Caucasian male in Mrs. Bic's Kindergarten class. He does not receive any services at Armand School. A.J. showed scores of 29 on the LNF, 9 on the LSP and 38 on the PSF according to the winter assessment of AIMSweb progress monitoring tool. These results show that A.J. is above the targeted level in LNF and PSF, however he is below the targeted level for LSP. A.J. is very social among his peers and shows excitement for learning and helping others.

Vaughn (pseudonym) is the fifth participant in this study. Vaughn is a five year old African American male, who does not receive any services in Mrs. Bic's classroom. According to the AIMSweb assessment in winter, Vaughn received scores of 49 on the LNF, 8 on the LSF and 9 on the PSF. These results show Vaughn to be above the target level for LNF. Vaughn is below target for the LSF and PSF assessments. Vaughn is an active learner and friend in Mrs. Bic's classroom. He continually shows his ability to be a good helper to his peers.

The final participant in this study is Xavier (pseudonym). Xavier is a five year old African American male in Mrs. Bic's Kindergarten classroom. He does not receive any services at Armand Elementary School. Xavier yielded scores of 45 on the LNF, 17 on the LSF and 16 on the PSF as a result of the AIMSweb assessment in winter. These results show Xavier to be above the target for the LNF, but below targeted levels for the LSF and PSF assessments. Xavier is an active and responsive learner in Mrs. Bic's classroom. He appropriately socializes with peers and helps others in his classroom community.

Researcher Stance

As the researcher for this study, I am currently a graduate student at St. John Fisher College. I am perusing my Master's Degree in Literacy (Birth-12th grade). I received a Bachelor's Degree from St. John Fisher College in Early Childhood, Childhood and Special Education (Birth-6th grade). I have been substitute teaching in the Rochester City School District for the past year in various elementary schools. More recently, I have taught in a long term substitute position for eight weeks in an integrated first grade setting. Additionally, my current position is an intervention teacher for Kindergarten through sixth grade, which I will carry out through the end of the school year. During this study, I took on the role of a privileged, active observer and a passive observer. According to Mills (2011), the role of a privileged, active observer allows the teacher to "stand back, and watch what is happening during a particular teaching episode, moving in and out of the role of teacher, aide and observer" (p.75). To begin this study, I took on this role through providing students with an informal lesson on how to use the applications on the iPad and explicit instructions to ensure control in my study. Additionally, I took on the role of a passive observe because after I initially introduce the iPad, I "no longer assume the responsibilities of the teacher", and instead "focus only on their data collection"

(Mills, 2011, p. 75). Taking on the role of the privileged, active observer and passive observer has an effect on my research because at the start of the study, students attempted to interact with me while I'm taking on the role as a passive observer.

Method

Throughout this study, I observed six participants and their reactions to the use of iPads for phonics instruction. This study took place over a two week period, where the students participated during regular school days. Additionally, I observed Mrs. Bic and her methods of classroom instruction across a variety of subject areas. I thoroughly observed Mrs. Bic during morning meeting for twenty minutes. During this time, I looked for how she integrated phonics with the morning meeting and calendar routine to determine how she teaches phonics in areas other than reader's workshop. I observed the morning meeting routine for 20 minutes to ensure I gathered background information suitable for this study. Additionally, I observed the participants throughout the study four times for at least 25 minutes each session.

The participants for this study were broken up into two different groups of three students each. Both groups contained students at high, medium and low levels of phonics knowledge. The groups were determined based on Mrs. Bic's preference for student participants. One group containing a high, medium and low student in the area of phonics was the control group. The control group continued with the applications that the teacher has in place on the iPads during reader's workshop time and participants did not have access to the additional applications I used throughout this study. The experimental group consisted of three students at comparable (according to Mrs. Bic) high, medium and low levels of phonics knowledge. The participants in the experimental group were provided with access to four additional phonics applications that they used during this study. Throughout this study, the participants worked in small groups of

four or five during reader's workshop instruction. Prior to beginning this study, both control and experimental groups were given phonics assessments to determine the participants' ability to identify letter sounds, identify letter symbols and read nonsense words. All participants were assessed after the study took place to measure growth of their knowledge in the specific areas of phonics that the students were pre-assessed on. During the observation sessions, I observed the classroom setting, routines for reader's workshop and the students' reactions to using the iPads with the specific applications I provided for them. I observed differences among the control group and experimental group at this time. These sessions took place at various times throughout the duration of this study.

Quality and Credibility of Research

Upon completion of this study, I ensured quality and credibility in my research. Mills (2011) defines credibility as "the researcher's ability to take into account the complexities that present themselves in a study and to deal with patterns that are not easily explained" (p.104). Throughout this research, I practiced this through peer debriefing, triangulation and referential adequacy. Mills (2011) explains peer debriefing for researchers as "the opportunity to test their growing insights through interactions with other professionals" (p.104). In this study, I met with critical colleagues to review and discuss my research as a way to provide feedback and credibility. These critical colleagues gave me extra insight and prompting as an outside resource to my study. I also used triangulation to further provide credibility. Triangulation refers to the method of collecting data, which allowed me to compare different sources and methods to ensure each method yields similar results (Mills, 2011). Finally, I ensured credibility through the use of referential adequacy, which would include test analysis in the study (Mills, 2011). For this

study, the pre and post assessments were used to determine growth among the participants which was the source of referential adequacy.

Transferability was also present throughout this study. Transferability is described as the researcher's understanding that everything in this study is accurate for the context that the study is taking place in (Mills, 2011). Furthermore, the information from this study cannot apply to different settings and participants. I ensured transferability by including detailed descriptive data and detailed descriptions of the context of this study.

Additionally, I guaranteed that this study encompasses dependability. Dependability refers to the stability of data within the study (Mills, 2011). I ensured dependability through the use of overlap methods and an audit trail. I used interviews, observations and assessments as my methods of obtaining data in this study. With the use of three different methods, dependability was accounted for. An audit trail was utilized in this study through the use of my critical colleagues in this process. My critical colleagues provided me with written feedback to determine if the research and study are comprehensible and accurately reflect the outcome of this study.

Finally, confirmability was included in this study as a means of quality of research. Confirmability refers to the "neutrality or objectivity of the data that has been collected" (Mills, 2011, p. 105). I used triangulation and reflexivity throughout this study to include confirmability. For triangulation of this study, I used interview, observations and notes, and assessments as my methods of research. Reflexivity took place in this study through my observations and notes that were taken during this study. I reviewed these notes to determine what information could be used without adding bias to my research. Furthermore, I constantly referenced my research questions to confirm that I was using research based information to support my topic.

Informed Consent and Protecting the Rights of the Participants

Prior to starting my study, I provided the necessary consent forms to participants in the study to ensure that I was protecting the rights of the participants in this study. I acquired an informed consent form from Mrs. Bic because I interviewed her to obtain information about her teaching experience and the make-up of her classroom. I obtained parental permission forms from the student participants' parents, due to their age. Additionally, I obtained verbal consent for the six student participants by asking the students prior to administering the pre-assessment if they would take part in this study. Each participant in the study received a copy of the consent form for their personal records. Furthermore, it is important to state that all students' names in this study remained anonymous through the use of pseudonyms.

Data Collection

There are many different tools used to collect data, which include active observation, field notes, interviews and assessments. My observations and field notes consisted of note taking throughout my observation sessions. I wrote down detailed descriptions of what was taking place during my time observing. These notes allowed me to reflect on the students reactions to the study. I also conducted one interview with Mrs. Bic to acquire information about her experiences, her classroom and the student participants in this study. This information allowed me to provide background information for the setting and participants in this study. Finally, I provided each of the six participants with three different assessments prior to the study. The three assessments included identifying sounds in letters, identifying the symbols that represent a given sounds and reading nonsense words. These three assessments were given to all six participants in conclusion of the study to determine if there was growth among the experimental group. In addition to the assessments that I administered, Mrs. Bic has provided me with past

assessments that show the participants levels of phonics knowledge. This information was collected by Mrs. Bic as part of the benchmark assessments, which are given three times throughout the year to measure student growth and levels in phonics. I feel that this information will be pertinent to this study because the purpose of this study is to determine growth among phonics in Kindergarten students.

Data Analysis

After completing the process of collecting data, it was important to organize, score, and interpret the information I gathered. Prior to completing the study, I interviewed the teacher to obtain information about the participants in the study and information about the use of iPads in the classroom currently (see Appendix A). When beginning my data analysis, first I scored the pre and post assessment according to the scoring guide that was given (*phonics assessment*). The first assessment required students to identify sounds of the alphabet (see Appendix B). The scoring for this assessment was based on the number of errors. The next assessment required students to identify symbols (see Appendix C) and was also scored based on the number of errors. The final assessment piece was based on the students' ability to read nonsense words (see Appendix D). This assessment was based on a two minute time limit and the number of errors in reading. After I scored the pre and post assessments, I watched the video tapes from the classroom observations of the study. While I watched the tapes, I took detailed notes about the participants in the study, as well the classroom environment throughout the study. Additionally, after completing the study and reviewing my field note observations, I interviewed the participants in the study and Mrs. Bic to gather more information to interpret the assessment scores (see Appendices E & F).

Once all the data was collected, I looked at the quantitative data scores to see the results of the pre and post assessments for each participant. Along with the quantitative data, there was qualitative data that was obtained from this research, which was used to further support the assessment data. I read through my field notes from the observations and the interview with Mrs. Bic to determine a rationale for the assessment results. Based on the information I gathered, I interviewed the participants to further supplement my assessment findings.

Findings and Discussion

This action research study showed quantitative data, which provided information that relates to the research question proposed. The purpose of this study was to determine if four phonics related iPad applications (Tiki Vowel, Phonics Fun One, Phonics Fun Two, and Phonics Fun Three) impacted kindergarten students' knowledge of phonics. To determine the impact of phonics iPad applications, there were participants at three different levels of phonics knowledge, above average, average, and below average. The levels of phonics knowledge were determined by Mrs. Bic, based on their classroom literacy abilities. There were six participants total, two students were considered above average, two students were considered average, and two students were considered below average in the area of literacy. Within each pair of students, one participant was considered for the control group and the other participant was in the experimental group. Therefore, within the above average, average, and below average pairs, one student was part of the experimental group and one student was part of the control group. Students in the experimental group were given access to the four phonics applications. Students in the control group were not given use of the four iPad applications for phonics instruction, and instead continued to participate in daily routines, phonics instruction, and iPad applications for reader's workshop set in place by Mrs. Bic. All participants in this study were given brief instructions as

to what they should be doing during their time on the iPads. Students in the experimental group were told that they could only use the iPad that had their names on it and were instructed to only use applications from the file titled “Miss J.” The control group was told that they could use any of the remaining iPads during their iPad time and continue use of the applications that Mrs. Bic instructed them to use during that time. Furthermore, prior to setting up the study, all participants in the experimental and control group were given a pre-assessment to determine their phonics knowledge prior to the study.

To begin this study, all participants were given the same three assessments to determine their level of phonics knowledge. All participants were given the same directions for each assessment, which were read from the assessment protocol. The first assessment participants were given was identifying sounds, in which students were asked to point to the given letters and state the sound that letter makes. The participants were asked to identify 16 different sounds for this assessment. The next assessment participants were given was identifying symbols, in which students were asked to point to the letter that makes the sound you say. Students were asked to identify ten different symbols for this assessment. The final assessment participants were given was a nonsense word assessment, which required students to correctly identify as many nonsense words as they could in a two minute time period. The total number of nonsense words that students were given to identify was 24 words. In addition to the pre-assessments, students were given the same three assessments after the study took place. During the post assessment sessions, students were given the same directions as in the pre-assessment. Furthermore, it should be noted that both the experimental and control groups were given the pre and post assessment. The data from this study shows an inconsistency, which could be related to additional factors that came about in observational field notes and interviews. The data from this

study will be interpreted in student pairs based on the levels, above average, average, and below average, of each participant.

Above Average Participants

The first pair of participants described in Table 1, Table 2 and Table 3 is Raina and Tony. Raina and Tony are both considered above average students in the area of literacy according to Mrs. Bic. Raina was part of the experimental group in this study, which indicates that she was only allowed use of the four specified phonics applications during her use of iPads. Tony was a participant in the control group and therefore used the iPad applications Mrs. Bic set in place for students during reader's workshop. Both participants were given the pre assessment prior to beginning the study and the post assessment after the conclusion of the study. Furthermore, both Raina and Tony were given the same pre and post assessments and the same set of instructions for each assessment, which were read from the assessment protocol. For the first assessment, identifying sounds, participants were asked to point to each letter on the assessment protocol and state the correct sound it makes. Table 1 shows the results of Raina and Tony's pre/post assessment scores in the areas of identifying sounds.

Table 1

Identifying Sounds Pre/Post Assessment Scores of Raina and Tony

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*Raina (above average)	16/16 (100% accuracy)	16/16 (100% accuracy)
Tony (above average)	16/16 (100% accuracy)	16/16 (100% accuracy)

The first assessment shown in Table 1, identifying sounds, indicates a pre and post assessment score of 100% accuracy showing no growth or regression in this area for both Raina and Tony. The results from this assessment could be an indication that the students have already mastered these phonics skills and it did not propose a challenge. Additionally, Mrs. Bic explained in an interview “at this point in the year, most students should have mastered letter sounds” (Williams, 2012, p. 2). This assessment was used to show their level of phonics knowledge as indicated by Mrs. Bic, which proves Raina’s and Tony’s mastery of identifying sounds.

The next assessment Raina and Tony were given was identifying symbols. Both participants were given the same pre and post assessment in identifying sounds and were read the same set of instructions as indicated on the assessment protocol. For this assessment, participants were asked to point to the letter that represented the sound I stated. The pre and post assessment results for Raina and Tony are shown in Table 2.

Table 2

Identifying Symbols Pre/Post Assessment Scores of Raina and Tony

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*Raina (above average)	10/10 (100% accuracy)	10/10 (100% accuracy)
Tony (above average)	10/10 (100% accuracy)	10/10 (100% accuracy)

The assessment results for Raina and Tony in the area of identifying symbols was consistent, showing both participants having 100% accuracy on the pre and post assessment.

These results therefore indicate no growth or regression for Raina and Tony in identifying symbols. Similar to the results of Raina and Tony's identifying sounds assessment, it's possible that this phonics concept did not propose a challenge to these participants. Furthermore, Mrs. Bic supports the idea that this assessment reflected a phonics skill that was already mastered by stating that "all students, except for a handful, can identify all the letters of the alphabet" (Williams, 2012, p. 2).

The final assessment that Raina and Tony were given was a nonsense word assessment. For this phonics assessment, both participants were given the same pre and post assessment, with the same set of assessment directions as stated on the assessment protocol. Students were told that this was a list of nonsense words, which means these words are made-up. They were then asked to identify as many of the words shown on the assessment protocol in a two minute time frame. Raina and Tony's results for the nonsense word assessment are shown in Table 3.

Table 3

Nonsense Words Pre/Post Assessment Scores of Raina and Tony

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*Raina (above average)	10/24 (42% accuracy)	17/24 (71% accuracy)
Tony (above average)	19/24 (79% accuracy)	19/24 (79% accuracy)

The assessment shown in Table 3 identifies pre and post assessment results in the area of nonsense word identification. Raina's pre-assessment score for the nonsense word assessment showed that she was able to correctly identify ten out of 24 nonsense words in a two minute time

frame, giving her 42% accuracy. Raina's post assessment results show that she correctly identified 17 out of 24 nonsense words in a two minute time frame, giving her 71% accuracy for her post assessment nonsense word results. The nonsense word assessment results show growth of Raina's nonsense word identification. It is important to take this information and interpret the results to determine reasons for her growth.

Based on Raina's assessment results, it can be implied that the iPad applications provided for the experimental group positively impacted Raina's phonics acquisition, specifically in the area of nonsense word identification. These results could be explained by her ability to stay on task when using the iPads during reader's workshop time because Raina was consistently on the applications that she was supposed to be using during this study (Observation field notes, February 27- March 9, 2012). An additional element that should be considered is the fact that Raina was the only student that does not have an iPad to use at home (Personal interview, March 23, 2012). Based on this information, her lack of use with an iPad outside of school could determine the reason for her ability to use the correct iPad applications because she may not know how to navigate other aspects of an iPad. Furthermore, Mrs. Bic stated "it doesn't surprise me that Raina showed growth, because she's very smart and was probably able to easily use the iPads the correct way during that time" (Personal interview, March 23, 2012). We can therefore conclude that the experimental group iPad applications are effective for Raina, in the area of nonsense words, when used consistently.

Tony continued a pattern of consistency, showing no growth or regression on his pre and post assessment for nonsense words. Specifically, Tony correctly identified 19 out of 24 nonsense words on the pre and post assessment in the two minute time frame, giving him 79%

accuracy. Based on Tony's assessment results, it can be stated that in all areas of phonics instruction, Tony showed no growth or regression.

The results from Tony's pre and post assessment implies that the applications regularly provided by Mrs. Bic show neither a positive or negative impact on his phonics instruction. The lack of growth or regression for Tony may be due to his inability to use other applications on the iPad. During a post interview, Tony explained that he only knows how to use one application on the iPad, which is Letter School (Personal interview, March 23, 2012). This application might not be challenging enough for Tony because the Letter School reinforces letter formation and letter sounds, which are the same areas that Tony showed mastery in, with 100% accuracy. Murray and Olcese (2011) support this information explaining that unless iPads offer instruction that isn't plausible by teachers, iPads will not show an impact on student learning. The application that Tony was using was in an area of phonics that he had already mastered, which would explain the lack of growth or regression in identifying sounds and symbols. Furthermore, this application doesn't reinforce letter sounds in context, which might explain his lack of growth or regression between his pre and post assessment of nonsense word identification.

Overall, based on the assessment results for the above average students in this study, it can be stated that the use of the four iPad applications showed growth in the area of nonsense word identification. It can therefore be conclude that the four iPad applications proved to be more effective in phonics than the iPad applications provided by Mrs. Bic. This positive effect can be concluded because Raina showed growth in her knowledge of nonsense words after use of the experimental iPad applications, and Tony showed no growth in the area of nonsense words with continued use of the applications provided by Mrs. Bic.

Average Participants

The second pair of participants is A.J. and Cici. A.J. and Cici are both considered average students in the area of literacy according to Mrs. Bic. A.J. was part of the experimental group in this study and Cici was a participant in the control group. Both participants were given the same pre assessment prior to beginning the study and the same post assessment after the conclusion of the study. The results of their assessments are shown in Table 4, Table 5, and Table 6. Table 4 shows the results of A.J. and Cici's pre/post assessment scores in the areas of identifying sounds.

Table 4

Identifying Sounds Pre/Post Assessment Scores of A.J. and Cici

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*A.J. (average)	15/16 (94% accuracy)	15/16 (94% accuracy)
Cici (average)	15/16 (94% accuracy)	14/16 (88% accuracy)

The assessment in Table 4 shows results for identifying sounds. A.J. displayed consistency in his pre and post assessment results for identifying sounds, yielding 94% accuracy. This consistency could be due to his concrete knowledge of letter sounds at this point in the year. Mrs. Bic explained that most students know all their letter sounds halfway through the year, which might explain the consistency in pre and post assessment scores (Personal interview, March 23, 2012). Contrary to what A.J.'s results revealed, Cici showed regression from her pre and post assessment of identifying sounds, displaying 94% accuracy on her pre-assessment and

75% accuracy on her post assessment. This regression could be explained by Cici's ability to manipulate the iPad. In a post interview she explained that she has an iPad at home and "plays temple run every day when I get home because my mom's not home" (Personal interview, March 23, 2012). Her daily interaction with iPads might reinforce her ability to manipulate the iPad and use other applications that she should not be using during reader's workshop. Blagojevic (2011) explains how Kindergarten students were able to show adults how to use and navigate on iPads, to show what they do during center time. The students' ability to navigate the iPads further reiterates students' abilities to use iPads, which could lead to misuse during instructional time.

The next assessment A.J. and Cici were given was identifying symbols. Both participants were given the same pre and post assessment, as well as the same set of instructions as listed on the assessment protocol. Table 5 shows the results for A.J. and Cici in identifying symbols.

Table 5

Identifying Symbols Pre/Post Assessment Scores of A.J. and Cici

Participant Name (* represents experimental group)	Pre (# correct/total#)	Post (#correct/total #)
*A.J. (average)	10/10 (100% accuracy)	10/10 (100% accuracy)
Cici (Average)	9/10 (90% accuracy)	10/10 (100% accuracy)

Similar to A.J.'s results in identifying sounds, he showed no growth or regression based on his pre and post assessment results for identifying symbols, which showed a result of 100% accuracy. A.J.'s consistency in the first two assessments, identifying sounds and identifying symbols, could be due to his firm knowledge of those particular skills. Mrs. Bic further

reinforces this explaining that “A.J. retains concrete skills such as letters and sounds easily” (Personal interview, February 29, 2012).

Cici’s results on the identifying symbols assessment showed growth from her pre to post assessment. On the pre-assessment, Cici showed 90% accuracy and on the post assessment, she displayed 100% accuracy. This growth could be due to the fact that Cici explained her favorite application to use on the iPad during center time in Letter School. In a post interview, she explained that it was her favorite application because “I like to make the letters with my finger” (Personal interview, March 23, 2012). Letter School reinforces letter identification through manipulation of letters, which would reinforce her ability to identify letters and could have been the reason for her growth in this area.

The final assessment that A.J. and Cici were given was nonsense word identification. Both participants were given the same pre and post assessment for nonsense words, in addition to the same set of directions as indicated on the assessment protocol. Table 6 shows the pre and post assessment results for A.J. and Cici in nonsense word identification.

Table 6

Nonsense Words Pre/Post Assessment Scores of A.J. and Cici

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*A.J. (average)	4/9 (44% accuracy)	2/11 (18% accuracy)
Cici (average)	0/8 (0% accuracy)	0/12 (0% accuracy)

The assessment shown in Table 6 was nonsense words, which displayed a regression in A.J.'s accuracy. On the pre-assessment, A.J. correctly identified four out of nine total nonsense words read in a two minute time frame, resulting in 44% accuracy. His post assessment results showed that he was able to correctly identify two out of 11 total nonsense words read in a two minute time frame, giving him 18% accuracy. Based on the information from A.J.'s assessments, it can be stated that the use of iPad applications given to the experimental group negatively impacted A.J.'s phonics acquisition, specifically in the area of nonsense word identification. Mrs. Bic explained that "A.J. is not a risk taker when it comes to academic work" (Personal interview, February 29, 2012). This information could explain his regression of a more challenging concept, such as nonsense word identification because he is more comfortable with concepts that he is familiar with such as identifying sounds and symbols. Additionally, Mrs. Bic states that "if students are able to manipulate, or know how to use the iPads well, they go on other applications that they shouldn't be on during that time" (Personal interview, March 23, 2012). A.J. shows the ability to navigate through different applications on the iPad and at one point is on a math application, unrelated to reader's workshop (Observation field notes, March 2, 2012). Bennett (2011/2012) explains that it is important to provide specific rules, navigation instruction, and organization on the iPad to prevent students from incorrectly using the iPads. This information is essential and could contribute to A.J.'s regression in nonsense word identification.

Furthermore, Cici's nonsense word assessment results show a sustained accuracy rate of zero percent on the pre and post assessment. Cici correctly identified zero out of eight total nonsense words read in the two minute time frame on the pre-assessment and correctly identified

zero out of 12 total nonsense words read in the two minute time frame on the post assessment. These results show that Cici showed no growth or regression in her nonsense word identification.

Based on the results of the pre and post assessments for Cici, there are some factors that can contribute to the inconsistency in her data. Mrs. Bic described Cici as “talkative and social with peers, which can sometimes distract her” (Personal interview, February 29, 2012). These behaviors are further supported by the observation field notes, which show Cici working with other students on the iPad and interacting with other students at the center, more-so than other students in this study (Observation field notes, February 27- March 9, 2012). Cici’s socialization may have played a role in her inconsistency because she may not have been focused on using the iPad application, rather more focused on interacting with peers. Furthermore, her frequent acts of socialization could have been caused by confusion of how to use the iPad applications. She may have turned to peers to work with her or help her determine correct answers.

Overall, based on the assessment results for the average students in this study, it cannot be concluded that the four iPad applications were more or less effective than the iPad applications provided by Mrs. Bic. A.J. showed consistency in his scores for identifying symbols and identifying sounds and Cici showed inconsistency, displaying a growth and regression in the area of phonics instruction. Specifically, Cici shows growth in identifying symbols and regression in identifying sounds based on the iPad applications regularly provided by Mrs. Bic. Based on these results, it can be stated that the four iPad applications were neither more effective nor less effective than the applications provided by Mrs. Bic. Furthermore in the area of nonsense word identification, A.J. showed regression from the pre to post assessment, however Cici showed a consistent score of zero percent accuracy from her pre to post assessment in the area of nonsense words. Her lack of regression could be due to the fact that it would not

be possible to regress further from a score of zero percent. Based on the results from the data, for average performing students the four iPad applications were neither more nor less effective than those set in place by Mrs. Bic.

Below Average

The final pair of participants are Xavier and Vaughn. Xavier and Vaughn are both considered below average students in the area of literacy according to Mrs. Bic. Xavier was part of the experimental group in this study and Vaughn was a participant in the control group. Both participants were given the same pre assessment prior to beginning the study and the same post assessment after the conclusion of the study. Table 7, Table 8, and Table 9 show the results of Xavier and Vaughn's pre/post assessment scores in the areas of identifying sounds, identifying symbols and nonsense words. The first assessment shown in Table 7 is in the area of identifying sounds. Xavier and Vaughn were given the same pre and post assessment with the same instructions as stated on the assessment protocol.

Table 7

Identifying Sounds Pre/Post Assessment Scores of Xavier and Vaughn

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*Xavier (below average)	15/16 (94% accuracy)	16/16 (100% accuracy)
Vaughn (below average)	12/16 (100% accuracy)	15/16 (100% accuracy)

The assessment shown in Table 7 is identifying sounds, which shows growth between the pre and post assessments for both Xavier and Vaughn. Xavier showed growth with 94% accuracy on his pre-assessment and his post assessment resulted in 100% accuracy. For Vaughn,

the pre-assessment results yielded 75% accuracy and the post assessment showed 94% accuracy, also showing growth in identifying sounds. This growth in identifying sounds could be because both participants expressed their favorite applications to be the Letter School application, which has students trace letters of the alphabet and then they are able to listen to the sound that letter makes (Personal interview, March 23, 2012). If both participants were using this application, then they would have repetition of letter sounds and be able to better retain that information, causing a potential growth. Furthermore, Mrs. Bic explains that “Vaughn needs some extra support, but retains information at a quick pace when instruction is repetitious” (Personal interview, February 29, 2012). His ability to retain information that is constantly reiterated to him could be the reason for his growth in identifying sounds.

The next assessment participants were given was identifying symbols. The results of the pre and post assessment results for Xavier and Vaughn are shown in Table 8. Both participants were given the same pre and post assessment and the same set of instructions as shown on the identifying symbols assessment protocol.

Table 8

Identifying Symbols Pre/Post Assessment Scores of Xavier and Vaughn

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*Xavier (below average)	10/10 (100% accuracy)	10/10 (100% accuracy)
Vaughn (below average)	10/10 (100% accuracy)	10/10 (100% accuracy)

The assessments shown in Table 8 are Xavier and Vaughn’s results in the area of identifying symbols. There was no growth or regression shown for Xavier and Vaughn’s pre and

post assessment in identifying symbols. Both participants showed pre and post assessment scores of 100% accuracy. According to the data, Xavier and Vaughn show mastery in the area of identifying symbols, which could be the result of the consistency in their assessment results.

The last assessment Xavier and Vaughn were given was nonsense word identification, which is shown in Table 9. For this assessment, participants were given the same directions and given the same pre and post assessment. The results for this assessment are shown below.

Table 9

Nonsense Words Pre/Post Assessment Scores of Xavier and Vaughn

Participant Name (* represents experimental group)	Pre (# correct/total #)	Post (# correct/total #)
*Xavier (below average)	2/7 (29% accuracy)	0/8 (0% accuracy)
Vaughn (below average)	0/11 (0% accuracy)	0/11 (0% accuracy)

Xavier's results on the nonsense word assessment show regression with a pre-assessment score of 29% and a post assessment score of zero percent. Specifically, in his pre assessment, he was able to correctly identify two out of seven total words read in a two minute time frame. In the nonsense word post assessment Xavier was able to correctly identify zero out of eight total words read in a two minute time frame. The regression in this assessment could be due to many factors. Mrs. Bic explains that "Xavier lacks self-confidence academically", which could have been a cause for his regression (Personal interview, February 29, 2012). Mrs. Bic's explanation of Xavier's lack of academic confidence is contrary to Cavanagh (2011) who explains that iPads boost confidence in students because of the many capabilities and options they offer students in learning. Furthermore, Mrs. Bic states "As far as the regression goes, Xavier is having some

serious changes in behavior lately, which are definitely impacting his achievement in school” (Personal interview, March 23, 2012). With all of the information from interviews and observation field notes, there are many factors that could have contributed to Xavier’s inconsistent assessment results.

Vaughn maintained an accuracy of zero percent on the pre and post assessment for nonsense word identification. On both the pre and post assessment, he incorrectly identified 11 words out of 11 total words read in the two minute time frame. This consistency could be due to the fact that Vaughn received the lowest score of zero percent accuracy on the pre-assessment, which leaves no room for regression on the post assessment. However, Vaughn also made no growth from the pre to post assessment for nonsense words.

Based on these results, it can be stated that for Xavier, the use of the experimental group iPad applications was inconsistent, displaying a growth in the area of identifying symbols and a regression in nonsense word identification. The inconsistency in results from this study for Xavier could be due to a variety of reasons. Mrs. Bic explained that he “needs extra practice time in small groups with a variety of instructional methods to consistently demonstrate skills” (Personal interview, February 29, 2012). Xavier supports this by stating “I use different applications because I get bored sometimes” (Personal interview, March 23, 2012). His need for variety is further shown throughout the study, when he used other applications that were not specified to use for this study (Observation field notes, March 2, 2012). Furthermore, it can be stated that for Vaughn, regular use of Mrs. Bic’s iPad applications showed growth in the area of identifying symbols, but maintained consistency in the areas of identifying sounds and nonsense words. Overall, for below average students, it can be stated that the four specified iPad

applications were neither more nor less effective than those iPad applications set in place by Mrs. Bic.

Further information supports the reason for inconsistency among data results for each student. Mrs. Bic explained that “the times for centers vary daily, so there is inconsistency of how long the students get to use the iPads” (Personal interview, March 23, 2012). One day that I observed the students using iPads, each group was given 15 minutes for iPad instruction (Observation field notes, March 2, 2012). On another occasion, the first three groups at the iPad centers were given 20 minutes of instruction and the last group was given ten minutes (Observation field notes, March 9, 2012). Mrs. Bic further explained that “the reason for the inconsistency is because we’re recently shifting from an ELA reading focus to a more writing centered classroom” (Personal interview, March 23, 2012). To supplement this inconsistency, Murray and Olcese (2011) state “we do not think the iPad will ignite a revolution in schools” (p.48). Although iPads are an innovative tool being used in classrooms, unless they can provide methods of instruction that supplement classroom instruction, iPads will not prove to be a highly effective method of student growth. The data for each student yielded different results which required many considerations in order to thoroughly analyze the data from this study.

Even though I didn’t find any definitive differences between the four iPad applications and the applications already set in place by Mrs. Bic, there were other findings that came about. Participants’ access to technology seemed to play a major role in the results from this study. For example, students who had iPads at home were able to better manipulate the iPads. Another finding that came about in this study was the type of application that students are drawn to. In a post interview, students were asked to identify their favorite iPad application that they use during reader’s workshop, which unanimously concluded that all participants liked the Letter School

application the best. When students were asked why this was their favorite application, one student explained that “some letters explode and say Whoo! And it’s funny” (Personal interview, March 23, 2012). Other students stated, “I like moving stuff” and “you can choose any letter, upper case or lower case” (Personal interview, March 23, 2012). Based on this information, it can be concluded that students are more interested in applications that give them variety, as well as applications that are interactive. Additionally, the students in the experimental group were asked which of the four applications that they used throughout the duration of the study was their favorite. All participants in the experimental group determined that Tiki Vowel was their favorite application because “you can pull objects and tickle the bear” (Personal interview, March 23, 2012). The information from these interviews corresponds with Bennett (2011/2012), who explains that each opportunity teachers give students to use iPads is “a chance to engage each student” (p. 25). The reasoning students gave for their interest in the applications show their engagement because they’re able to manipulate things on the iPad. Even though the results of this study were inconclusive, the use of iPads should be considered for classroom teachers.

Implications

Through assessment data, observations, and interviews, it has been found that phonics iPad applications, specifically Tiki Vowel, Phonics Fun One, Phonics Fun Two, and Phonics Fun Three, cannot be proven a more or less effective method of phonics instruction. The data from this study was inconsistent among the participants and therefore cannot be concluded as more effective than other phonics iPad application. The results from this study leads to implications for teachers.

Based on the data shown in this study, teachers need to be aware of what the use of iPad applications means for them as educators. The results from this study varied among the

experimental and control group, concluding that teachers need to think about the impact of iPads on learning. In a kindergarten learning environment, the iPad applications specific to this study did not prove to be more or less effective than those already set in place by the teacher. Teachers who are currently using iPads for phonics instruction in their classroom should consider the effectiveness of iPad instruction. There are many factors to consider when determining the impact of phonics instruction through the use of iPads, such as students' knowledge of phonics, the instructional purpose of iPad applications, students' familiarity with iPads, and informal follow-ups with students using the iPad .

One implication that teachers should consider when using phonics related iPad applications is the student's current level of phonics knowledge. It is important that students are using applications that are appropriate, meaning that the information presented in the application is not something that students have already mastered and not something that is too far above their grade level. Blagojevic (2011) supports the need for challenging, yet independent use of iPad applications explaining that it's important for teachers to check in with students and informally assess students during their iPad use to ensure the material is relevant to their needs.

Another implication for teachers is the instructional purpose of iPad applications. Teachers should consider how the iPad applications are being used and if their use is effective. Murray and Olcese (2011) explain that iPads should be used as a supplementary tool for instruction, rather than a replacement of teacher instruction. Based on this information, teachers should determine if the iPad applications students use are a way to reinforce their instruction in a way that's not feasible through teacher instruction. If the iPad applications are serving as a replacement to teacher instruction, then they will not have a greater impact student learning, because they are not achieving something different from what the teacher can provide for

students. Furthermore, teachers need to ensure that the applications on the iPads are relevant to what students are learning in the classroom through teacher instruction.

The next implication that teachers should consider when using iPads for phonics instruction is ensuring that students know how to use each application that is available to them. Bennett (2011/2012) explains that teachers should “create an instruction card that explains how to use the iPad and the rules for using the device” (p.24). If teachers are able to explicitly instruct students on how to use the iPad and the specific applications that are on it, the teacher can be confident that students will be able to effectively use the applications provided to them. It is also important that teachers check in on the students to be sure that they are correctly using the iPad to validate that students are using the proper applications.

The final implication for teachers and the use of iPad applications is a follow-up with students after introducing new applications. It is important to be sure that student needs are being met through the use of the applications that teachers provide for them. In order to determine if students can correctly utilize the applications, teachers need to check in with students and have them explain or show them proper use of the application. If students are able to manipulate the application correctly, then it will prove their able to effectively use it. Additionally, the teacher can informally assess student progress to determine if the applications are appropriate for their level. Furthermore, the teacher can determine how the student is using the various applications, or if the student consistently uses the same one. This monitoring of students will give the teacher an idea of the type of applications are engaging to the students and if the student is reinforcing the skill through multiple applications.

Overall, there are several implications that need to be taken into consideration when using iPads for phonics instruction. It is important to determine an instructional purpose, ensure appropriateness, confirm proper usage, and include a follow-up with students. These are all implications that were not taken into consideration when conducting this study, and therefore could show different results when applied.

Conclusions

The purpose of this study was to determine if specific phonics iPad applications were more effective than the literacy iPad applications already set in place by the classroom teacher. The use of technology in schools reflects the new literacy theory based on the opportunities students are presented with through technology. The iPad is one of the ways that classrooms can provide students with this type of learning experience. Research explains that iPad use for phonics can be beneficial when used to supplement teaching as opposed to replacing it. Through observations, interviews, and data assessments it was concluded that the phonics iPad applications used in this study proved neither more nor less effective than the applications set in place by the classroom teacher. Based on these findings, there are many implications that teachers should consider when using iPads.

The research from this study presented many limitations that should be considered when taking this data into consideration. The first limitation for this study was that the classroom teacher was already implementing the use of iPads; therefore I was unable to determine if phonics instruction through the use of iPads was more effective than teacher directed phonics instruction. Another limitation for this study was the inability to control the participants' use of the iPads, in terms of what applications they were using and how long they were able to use the

iPad applications. If I was able to control the experimental participants' use of the specified applications, different data may have resulted. Furthermore, if all participants consistently used the applications for the same amount of time then the results also may have been different. The final limitation to the study was the participants' exposure to iPads prior to this study. All participants except for one in this study have access to iPads in their home environment, which could have impacted the results of this study. Based on these limitations, there were lingering questions that were not answered based on this research.

After analyzing the data from this study, I was left wondering about different outcomes that could have occurred based on the limitations that were presented for this study. I was curious to see if the use of iPads in general shows an impact of student knowledge in the area of phonics, not just if specific applications prove to be more beneficial. I was also left thinking about how the study may have concluded different results if there was more consistency among the use of the iPads. If all participants in this study were able to use the iPads for the same amount of time and the same number of days, I wonder if the results may have been different. Furthermore, it would be interesting to see the effect that iPad use has on students with disabilities and if it would prove more effective.

Overall, there are many factors that should be taken into consideration when using the information from this research. The findings from this research surprisingly concluded that the four specified phonics applications were neither more nor less effective than the applications already set in place by the classroom teacher. These findings conclude what prior research has said about the iPads, because the phonics instruction exhibited on these applications is a replacement of teacher directed instruction, rather than an additional support (Murray & Olcese,

2011; Bennett, 2011/2012). Supplementary research should be done to determine the impact of iPads on phonics acquisition.

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Appendix A

Interview Questions

1. How long have you been teaching for?
2. What are your certifications in?
3. How long have you been teaching at this school and in this district?
4. What grade levels have you taught?
5. What are your job responsibilities?
6. What are the demographics of your classroom? (number of students, gender, race, age, students who receive services, what services they receive, IEP's, ESL students)
7. What method of phonics instruction are you currently using?
8. Do you feel this method is effective? Why or why not?
9. What methods of phonics instruction have you used in the past?
10. Which method of phonics instruction do you think was/is most effective? Why or why not?
11. What assessments do you use to measure phonics skills?
12. When did you receive iPads in your classroom? How many do you have?
13. How do you use iPads in your classroom? (Are they used for instructional purposes?)
14. Do you feel the iPads are benefiting students? Why or Why not?
15. Do you think the use of the iPads has/will increase students' knowledge of phonics?
16. Briefly describe the students I will be working with (age, race, gender, services they receive and personalities). These students include Raina, Tony, Cici, A.J., Vaughn and Xavier.

Appendix B



Phonics

Assessment Identifying Sounds • Form 1

Name _____ Date _____ Number of errors _____

DIRECTIONS: Point to each letter and ask what sound it makes. Place an X above each letter and sound match the child gets incorrect. If the child names the letter instead of saying the sound say: *That is the name of the letter.* Then ask them what sound the letter makes?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	v	k	l
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s	m	r	v
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	n	w	f
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t	h	j	p

Appendix C

Reading a-z

Phonics

Assessment Identifying Symbols • Form 1

Name _____ Date _____ Number of errors _____

DIRECTIONS: For each set of letters have the child point to the letter that makes the sound you say. Place an X in the box for each incorrect response.

Point to the letter that makes the /t/ sound as in the word *top*.

d	p	t	k
---	---	---	---

Point to the letter that makes the /m/ sound as in the word *map*.

n	r	w	m
---	---	---	---

Point to the letter that makes the /k/ sound as in the word *kite*.

k	b	f	z
---	---	---	---

Point to the letter that makes the /v/ sound as in the word *van*.

c	w	v	h
---	---	---	---

Point to the letter that makes the /a/ sound as in the word *apple*.

e	a	s	o
---	---	---	---

Errors Errors

Point to the letter that makes the /s/ sound as in the word *sake*.

v	e	s	z
---	---	---	---

Point to the letter that makes the /w/ sound as in the word *water*.

v	w	m	u
---	---	---	---

Point to the letter that makes the /u/ sound as in the word *up*.

u	a	v	e
---	---	---	---

Point to the letter that makes the /f/ sound as in the word *fox*.

d	v	g	f
---	---	---	---

Point to the letter that makes the /o/ sound as in the word

s	u	a	o	e
---	---	---	---	---

Errors

Appendix D

Phonics

Assessment Reading Nonsense Words • CVC and VC

Name _____ Date _____

Number of words read _____ Number of errors _____ Time _____

DIRECTIONS: Tell the student he/she is going to read some made-up words and that you will time him/her. If the student has not completed reading all the words in two minutes, stop the reading. Note the time it takes to read the words if he/she does so in less than two minutes. Demonstrate with the first word.

PRACTICE: Point to the word *pim*. Say: *Look at this made-up word. Watch my finger as I read this word. I will sound out each letter then I will read the word.* Point to each letter as you sound out the word. After sounding out the letters say the word while running your finger under it. Say: /p/ /i/ /m/; *pim*. Now it is your turn to sound out and read the next word. See how many you can read in two minutes.

pim

nib

et

ux

hax

dop

yin

bem

hud

vill

mup

seg

tog

lig

zab

ap

jod

tox

fod

ix

wib

mag

ped

ret

Appendix E

Participant Post-Interview

Which application that you use during centers on the iPad is your favorite? Why?

Do you know how to use all the applications for center time?

Do you usually stay on the same application the whole time you're at the iPad center?

Do you have an iPad at home? If yes, how often do you use it?

Experimental Group Question:

Which application, out of the ones that I gave you to use, was your favorite? Why?

Appendix F

Follow-up Teacher interview

After looking at the data, is there any rationale you can come up with for the results of the study?