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# Using Technology as a Teacher Differentiation Tool to Increase Students' High Frequency Word Recognition

## Abstract

This research asked, "how does technology, as a teacher assistive differentiation tool, increase students high frequency word recognition?" Research was conducted in Greenville, New York with a group of nine first grade students all classified with a disability. Students were placed in either an iPad or flash card group. Quantitative and qualitative data was collected through questionnaires/interviews, student observations, and assessment. Findings revealed that both the groups increased their word recognition; however, the iPad group revealed a greater percentage increase when compared to the flash card group. The data implies there is a correlation among students with disabilities and using technology to increase word recognition. Teachers must use available resources to reach students individual needs and learning styles.

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Using Technology as a Teacher Differentiation Tool to  
Increase Students' High Frequency Word Recognition

By

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Submitted in partial fulfillment of the requirements for the degree

M.S. Literacy Education

Supervised by

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**Abstract**

This research asked, “how does technology, as a teacher assistive differentiation tool, increase students high frequency word recognition?” Research was conducted in Greenville, New York with a group of nine first grade students all classified with a disability. Students were placed in either an iPad or flash card group. Quantitative and qualitative data was collected through questionnaires/interviews, student observations, and assessment. Findings revealed that both the groups increased their word recognition; however, the iPad group revealed a greater percentage increase when compared to the flash card group. The data implies there is a correlation among students with disabilities and using technology to increase word recognition. Teachers must use available resources to reach students individual needs and learning styles.

### **Using Technology as a Teacher Differentiation Tool to Increase Students' High Frequency Word Recognition**

The topic I have chosen to research for my capstone is using technology as a teacher differentiation tool to increase student high frequency word recognition. High frequency word recognition is the ability to recall words that are most often used in printed materials and are often words that “cannot be sounded out using common sound-to letter implicit phonics patterns and must be learned by sight” (Yaw, Skinner, Parkhurst, Taylor, Booher, & Chambers, 2011, p. 47). As technology is rapidly advancing, this topic is relevant today, as reading is one of the most important skills learned in school. Baron (1999) declares that technology is a gateway to literacy. It is important for teachers to use the available technology as a tool to individualize instruction based on the needs of their twenty first century students, with and without disabilities, who are learning the process of reading high frequency words in their primary years.

If this topic is not explored, students may not have the necessary tools or motivation to reach their fullest potential if taught and practiced using the basic paper and pencil approach. In exploring this topic, students increase their high frequency word recognition through the use of motivating and interactive technological devices such as an iPad or tablet. Fasting and Lyster (2005), state that “to some children the road towards literacy competence is an everyday struggle with words and letters” (p. 21). In the early stages, the child’s basic knowledge of the alphabetic system fuels the development of phoneme-grapheme correspondences and how letters can be combined into words. At a later phase in student development, fluency reading is acquired (Fasting & Lyster, 2005). In order for students to become fluent readers, they must master and be

able to recognize words that are commonly used in texts. Being able to recognize high frequency words is a stepping stone in being able to read and decode words in sentences.

Howard Gardner (1983) developed the theory of multiple intelligences and believed that people have nine multiple intelligences of varying degrees: verbal-linguistic, mathematical-logical, musical, visual-spatial, bodily-kinesthetic, interpersonal, intrapersonal, naturalist, and existential. “These multiple intelligences can be nurtured and strengthened, or ignored and weakened” (What is the theory of multiple intelligences? section, para. 1). Teachers must connect and create lessons that build off of students multiple intelligences where they can continue to be nurtured and strengthened. When students are learning in the way that is best suited to them, they are more likely to be successful. When their learning style is ignored, they may not learn successfully. Technology has a way of encompassing and intertwining many multiple intelligences together, allowing more students to be successful if incorporating technology into academics, specifically with high frequency words. Possibilities are endless when discussing what an iPad or tablet can do with motivating and engaging students in learning high frequency words.

Technology allows students who are learning high frequency words to be actively involved. It allows students to manipulate letters, use voice/sound controls, highlight, and animate, all while appealing to a young child's eye with an abundance of colorful images and/or letters. In doing so, it “takes us a step beyond what we could do with ordinary typing paper” (Baron, 1999, p. 27). If teachers have access and use the appropriate technology as a way to differentiate instruction for increasing high frequency word recognition in their primary years, success can be achieved.

An area that may severely impact a student's learning is based on available resources, specifically due to a school's budget. If a school does not have the necessary funds to make technology available in classrooms, it will have a large negative impact on student achievement, motivation, and academics. Without the necessary funds to purchase and use technology in classrooms, students will be at a severe disadvantage when compared to students who do have the available resources in their classrooms. When students have access to technology in their homes and in their communities but do not have access in their classroom or do not have technology available at home, communities, or at school, motivation and academic success will most likely be hindered (Parette, Blum, Boeckmann, & Watts, 2009). By using technology such as an iPad or tablet, students may individually work on high frequency words specific to their needs. For example, if Annie is in first grade and has not yet mastered all of the kindergarten words, she will be working on those words while Johnny has mastered all of the kindergarten words which allow him to work on learning the first grade words. Technology allows academics to become more individualized based on their needs.

The following research was conducted to further analyze the affect technology can have on student reading achievement. This study asked how does technology, as a teacher assistive differentiation tool, increase students high frequency word recognition? This topic relates to the theories of new literacy and culture as a disability. Three common themes were found among the literature. The first theme discusses technology is an effective tool for identifying words automatically. The second theme discusses technology as a student motivator. The third and final theme describes how successful technology is when used with students who have disabilities. It is important to not only review past research but also conduct my own research to observe how

affective technology can be on students' high frequency word recognition. My research took place in Greenville, New York (pseudonym) with a group of nine students who are classified with a disability. These students were placed into two groups: experimental (iPad) and control (flash cards). Through the quantitative data collected through questionnaires/interviews, observations and test results, similar findings were observed to findings in the literature. The students who used the iPads read a higher percentage of their target words than the students who did not use the iPad and used flash cards. The findings demonstrate that there is a correlation between students with disabilities and using technology such as the iPad to increase high frequency word recognition. With such results teachers must use available resources such as technology to reach students' individual needs and learning styles.

### **Theoretical Framework**

#### **What is Literacy?**

Because literacy is an umbrella term in which reading, specifically high frequency words fall under, it is important to define literacy. Literacy is a dynamic, malleable, and multidimensional social practice. Lankshear and Knobel (2007), define literacy as “socially recognized ways of generating, communicating and negotiating meaningful content through the medium of encoded texts within contexts of participation in discourses”(p.224). Similarly, Gee (2001) defines literacy as “control of secondary uses of language (i.e. uses of language in secondary discourses)” (p.23). Discourse involves a set of values, norms and viewpoints one must attain. Discourses hold hierarchical structure in society by distributing power. For most people, any Discourse, is only mastered or having “full and effortless control” through acquisition, not learning (Gee, 2001, p. 23). Acquisition takes place subconsciously by exposure

in natural settings which are meaningful and functional, whereas learning is a conscious knowledge gaining process through teaching.

Freebody and Luke (1990) describe that we are more successful readers and writers if we are able to manipulate texts than we are if we cannot decode or spell. By incorporating technology into classrooms, specifically to increase high frequency word recognition, students are acquiring knowledge by utilizing it in their natural academic setting; their classroom. They are taking part in the learning process to acquire the information needed to recognize high frequency words whether it is through manipulating the letters or through having a picture relating to the word.

The two theories that directly connect to the topic of using technology into increase high frequency word recognition include the theory of new literacies and the theory of culture as a disability. The perspective of “new literacy” helps us to understand literacy as a way to manage social relationships between people in everyday formal and informal interactions. Literacy is defined from the new literacy perspective as a “socially recognized way of generating, communicating and negotiating meaningful content through the medium of encoded texts within contexts of participation in discourses” (Lankshear & Knobel, 2007, p. 224). This perspective helps us to understand literacy as a tool for maintaining social relationships in everyday interactions between people in both formal and informal settings. Old literacies are practices involving traditional literacies through the basics of print, paper and pencil writing. With technology constantly advancing at a rapid pace, the theory of new literacies was created. New literacies is a term described as literacy instruction with new information and communication technology allowing for transformation of instruction that is more inclusive for all students;

those with and without disabilities who learn using various multiple intelligences (Gainer & Lapp, 2010). Teachers must be prepared to be flexible and adapt to the continuous changes in technology to allow for student of various ability levels to reach success. When teachers combine digital technology developments with traditional methods of reading and writing, new literacies can be found where new social practices for literacy emerge. By incorporating technology such as iPads into instruction and practice, students will be engaged in the authentic practices connected to their social and cultural practices.

A connection can also be made to the theory of culture as a disability. McDermott and Varenne (1995) define the culture as a disability theory as, disabilities are less the property of persons than they are moments in a cultural focus. Culture comes from the partial and mutually dependent knowledge of each person and depends on the work we do together. It is made up of many voices brought to life by others. It is mutually constructed, and interactional achievement, it is never an individual property. McDermott and Verenne (1995) discuss how our culture has become an organization and has created a vision for how the world should be, how people should act and what people should hope or dream to be. Every culture instructs its populace what that culture believes they should strive for and if individuals don't show an attempt, they are rejected. When a student is not given the opportunity to use technology to advance their high frequency word knowledge because of budgeting deficits, they are being neglected of the ways they may learn best. The students who don't have access or given the opportunity to use technology in their culture or at their school, they are being deprived and stand out as distinctly different from students who do have access in their culture or school. In turn, the result might demonstrate failure or delaying their success.

The theory of culture as a disability addresses the issue of the difficulties people experience and how it tells little about the physical conditions of the people that are being labeled. The students who are not making growth because their culture or school lack access to the tools are demonstrating a disability because they are being compared to those who do have access and are showing growth. Their classroom or school culture is to blame as to why they are not progressing at an acceptable rate. Those who are not making the necessary gains through traditional literacies, could be making those gains with new literacies including iPads. However, when a school or classroom does not have the necessary funds, students' motivation and high frequency word achievement is being negatively impacted, which in turn labels them "disabled." These students are being deprived of what could be a way that they learn best and blame is now put on the individual as not being able to increase their high frequency word recognition as expected. The students who would in turn find success with the given technology, however do not have it available to them, are silenced as they are not seen as meeting expectations. In another respect, they are the ones getting the most attention in terms of getting support after being identified as not meeting expectations, specifically in high frequency word recognition (McDermott & Varenne, 1995). It is important for teachers to implement the appropriate resources to meet the needs of their students. Students can achieve success through using technology such as iPads, which allows for individualization and encompasses multiple intelligence's. It is hoped that students will no longer be viewed as having a deficit if they are not meeting expectations, but are understood to be learning in a different way, and with using technology, they will meet expectations.

### **Research Question**

Based on the two theories of new literacies and culture as a disability, it is crucial to implement technology into classrooms as it allows for teachers to differentiate instruction based on students' needs. It is possible that schools and/or classrooms may not have the technology such as iPads or tablets necessary for students to increase their high frequency word recognition. Given that new literacy is a way for literacy instruction to be presented using new information and communication technology that is more inclusive for all students, this action research project asks, how does technology, as a teacher assistive differentiation tool, increase students high frequency word recognition?

### **Literature Review**

The following literature review will provide supporting evidence from various scholarly studies that will demonstrate the positive impact that technology can have on students' ability to recognize high frequency words. High frequency words are "words that a student can recognize without hesitation or analysis" (Burns, 2007, p.250). They are often words that cannot be sounded out and must be learned by sight. Word recognition is a foundational skill for successful reading. Children must be able to recognize words to possess competencies with reading as they progress through the years. Adams (1990), explains that "students who fail to develop strategies for word identification are at serious risk for academic failure because of debilitating effects on other reading skills, such as fluency and comprehension" (p. 80). Difficulty in acquiring those skills can be the cause of the inability to comprehend the meaning of text.

The ability to recognize words automatically is a necessity for reading success. Being able to recognize words rapidly and accurately is an important component to the acquisition of beginning reading skills in young children's emergent literacy experience (Greene, 1988). Word

recognition serves as one prerequisite for future reading and writing. Students must gain competence in identifying words automatically through ongoing instruction and practice. When students are able to recognize words in isolation or in text quickly and effortlessly, they will be successful readers. According to Lee and Vail (2005), Burns (2007) and Meadan, Stoner and Parette (2008), high frequency or sight word reading is a skill that one needs to survive and is essential for independently living within a community. It is essential to be able to identify words on street signs, grocery store items, etc.

Effective high frequency word instruction is important, especially for students with disabilities, as it provides a “comprehensive foundation for functional academics” (Burns, 2007, p. 250). Students with disabilities are among those who often have difficulty understanding instructional tasks if effective teaching strategies are not implemented. Therefore, students with disabilities or students who struggle may need instruction that may differ from their peers. In turn, these are the students who require explicit and direct instruction to develop word identification skills. Van Norman and Wood (2008) define explicit instruction as “the careful selection of materials that provide students with the appropriate level of scaffolding, feedback, practice and review to acquire new skills” (p. 96). Explicit teaching involves directing students towards a specific outcome or skill. In addition to explicit instruction, Parette, Blum, Boeckmann and Watts (2009) describe direct instruction as a teaching model that emphasizes well developed lesson plans which are designed around clearly defined teaching tasks. When teachers implement an evidence-based, cooperative learning strategy to teach automaticity in high frequency word recognition, students show greater achievement and accuracy.

There are three common themes found among the scholarly articles. The first theme is using technology as an effective way for students to identify words automatically. Computer technology has advanced the development of the educational approach through differentiated instruction. It enables new ways of learning and teaching children with different learning styles and needs where traditional methods may not always be appropriate or productive (Williams, Wright, Callaghan, & Coughlan, 2002). In this way, technology can be used to assist teachers' interventions so that students with difficulties in reading are supported in an appropriate way. The second theme is using technology as a student motivator. Many students are motivated by using technology due to its interactive and engaging nature. The last common theme found among the research examines the participating students within the studies; specifically in terms of student abilities (ie: students with disabilities, students at risk and English as a Second Language/English Language Learning students) and the grouping of students (ie: small group, one on one, whole group, etc.)

### **Technology as an Effective Way to Identify Words Automatically**

The first common theme found among multiple research articles was that of using technology as an effective way for students to identify words automatically. When teachers implement technology into their instruction, students are engaged and motivated. If iPads are incorporated into learning and practicing high frequency words, students will find effective ways to identify high frequency words more quickly. There are many studies that prove technology has the power to positively impact students' high frequency word recognition. Technology can be consistent and predictable as it requires "multimodal involvement of the learner" including images, color, and other elements are often presented in tandem with text (Meaden, Stoner, &

Parette, 2008, p. 46). Students are not only able to see the text, they are also able to hear and manipulate it as well. Technology can often be adapted to meet the needs of children through finding and changing settings of appropriate apps. The research has been carried out in many ways using a multitude of technological devices. Mechling, Gast, and Thompson (2008) research has proven that using the Smartboard is more effective than using flash cards as a means of increasing students' high frequency word recognition. Their study compared groups of students who used the Smartboard and a group of students who used flash cards. The group who used the Smartboard demonstrated a higher percentage of students who read their words correctly. Similarly, Beechler and Williams (2012) found that when high frequency words were placed on computerized flashcards they became more effective when computer assisted instruction was implemented into regular classroom teaching. The study results demonstrated an improvement in student performance and increase in word recognition skills through using such technology.

Time delay was another method used by multiple researchers to study the effects of technology on high frequency word recognition. Time delays are time intervals "inserted between the task request and the controlling prompt, giving the student time to respond before the prompt if the answer is known or to wait and receive the prompt if the answer is not known" (Stevens, Blackhurst, & Slaton, 1991, p. 153). Researchers who investigated time delay intervals found that students may learn more words when intervals are longer, as longer intervals provide students with adequate time to respond. Students with disabilities seemed to benefit from longer time delays as it gave them an opportunity to process the task and allowed more time to answer. In contrast, Yaw, Skinner, Parkhurst, Taylor, Booher, and Chambers (2011) believe that the longer intervals can reduce learning trial rates, therefore impede learning. A

second concern they found was with longer time intervals, the pace of responding is reduced, allowing for enhanced off task behavior.

To prove their belief, Yaw, Skinner, Parkhurst, Taylor, Booher, and Chambers (2011) carried out a study to test whether intervals could aid or hinder learning. In their study, sight words appeared on the screen for two seconds, followed by the primary experimenter's voice recording of the sight word, and another two second delay before the next word appeared. The student was instructed to read the word before the recording sounded and repeat the word after the recording. The results indicated that the participant with autism was not showing any evidence of an increasing trend in word recognition with a two second time delay as he only could read one out of the 30 words correctly during the baseline. After the implementation of a voice recording in addition to the two second time delay intervention was in place, the student increased his words read recognition to correctly reading 25 out of the 30 words. These results indicate that timed intervals increased word recognition and gave students appropriate time to respond and words learned were maintained after the intervention. Similarly, Stevens, Blackhurst, and Slaton (1991) carried out a study that also evaluated a computer assisted program that used the constant time procedure with participants with disabilities. A unique feature to this study that is unlike other time delay studies as it used features of a microcomputer to manage the content items based on each student's response. This software allowed for the examiner to keep the student's history in an organized and easy to use manner. The research indicated that constant time delay was effective in teaching acquisition of a variety of tasks including sight word reading.

Mechling, Gast, and Krupa (2007) also carried out a study which implemented the time delay feature to investigate high frequency word reading using the SMART board. Results of

this study indicated an increase in correct reading and matching of word sets to the target high frequency words using the SMART board with a three second constant time delay. The SMART board allowed students to quickly and correctly read and match words within a time constraint of three seconds. As found in the previously discussed studies, Yaw, Skinner, Parkhurst, Taylor, Booher, and Chambers (2011) and Mechling, Gast, and Krupa (2007) found before interventions, students were not able to match objects to printed words, however after interventions they found success with using the SMART board technology and time delay. Students in both studies increased their reading of high frequency words when technology was implemented into their reading instruction.

Similar to Yaw, Skinner, Parkhurst, Taylor, Booher, and Chambers (2011) and Stevens, Blackhurst, and Slaton (1991), Koury and Browder (1986) also carried out a study on time delay on students with disabilities. However, unlike those two studies which implemented a *constant* time delay, Koury and Browder (1986) studied the use of delay to teach sight words using a time delay schedule which gradually increased the increments of time delay by two seconds, starting at zero seconds and reaching eight seconds. As students mastered words, the schedule of time delay decreased. This study found rapid acquisition of sight words with the use of the time delay. It was found that the interval schedule time delay was effective and efficient for students with disabilities but also may be beneficial for students who are struggling readers or students who are English Language Learners.

Based on the results of the studies done using the time delay feature, it can be said that this feature is effective for students with disabilities. Both a constant time delay as well as a increased time delay were proven successful for students high frequency word recognition. One

method of the time delay feature did not to prove to be more effective over the other as they were not compared in one study. However when looking at this feature as a whole, it has proven effective. The majority of the participating students within these studies demonstrated an increase from pre-investigation to post-investigation when the time delay feature was implemented.

Another route technology can follow to increase word identification is through computer assisted instruction. By combining traditional teacher instruction with computer assisted instruction, student learning is more effective and efficient. By allowing the two methods to come together, teachers are able to increase reading achievement by increasing the amount of time instructing. By pairing these two methods, teachers are able to differentiate and accommodate students at multiple levels. It acts as a teaching assistant in some respect. Two studies were carried out by Coleman-Martin, Heller, Cihak and Irvine (2005) and Baumgart (1987) to investigate and determine the effectiveness of these methods. The studies investigated the effectiveness of teacher instruction, computer assisted instruction or a culmination of both teacher and computer assisted instruction, on word recognition. It was found that all participating students in both studies reached criterion using all three conditions; teacher only instruction, teacher and computer assisted instruction and computer assisted instruction only. In terms of high frequency word automaticity, it is important to note a majority of the students took longer to learn the words in the teacher only condition. Similar to the previously mentioned studies, researchers found that in these studies, computer assisted technology was effective and an efficient method for teaching students word identification (Coleman-Martin, Heller, Cihak, & Irvine, 2005 and Baumgart, 1987). Baumgart also found that in her study participants

demonstrated on task behavior 100% of the time. The students in this study were consistently focused and motivated throughout the study.

As the previous studies have found technology effective for increasing students' high frequency word recognition, another method was used to prove similar findings. This method used for the following study examines the effects of using pictures to teach and practice high frequency words. Meaden, Stoner, and Parette (2008) found that the intervention group of participants who used both print and picture to read high frequency words, performed better than the participants who had only high frequency words printed on their cards. These results indicate that technology is beneficial for young children in identifying high frequency words when print and pictures are combined as pictures provide clues to the meaning of words and help beginning readers learn new words (Arlin, Scott, & Webster, 1978-1979). It is important to note that children may become dependent on the pictures and therefore correctly identifying high frequency words based solely on the picture. This behavior may distract students and cause children to lose focus on the word (Meadan, Stoner, & Parette, 2008). When words can be matched with pictures, it can assist students in reading the word correctly. If the picture is consistently there every time, students will rely on them making their decoding and word solving strategies ineffective and not useful. When compared to incorporating pictures or voice, pictures increased students' word recognition. Arlin, Scott, and Webster (1978-1979) found that "the use of pictures as a presentation cue gave rise to a significantly faster learning rate than voice did" (p. 655). Both studies are similar in the respect of comparing the effects of using technology pictures as an aid during direct high frequency word instruction. It is important to use

pictures as an aid and should be gradually withdrawn as time progresses, but they should not be used so much that they are heavily relied upon.

### **Using Technology as a Student Motivator**

The second common theme among the research was that of technology as a source of motivation for students. When students are motivated they are more willing to take part and have a sense of ownership in the learning. When the learning process involves something students are interested in or something that is interactive, they are more willing to take part in it, versus learning that is not. Fasting and Lyster (2005), investigated the effects of using a computer program to assist reading development among struggling readers. Specifically they studied 52 young students with disabilities and poor readers. The experimental group used computer software that involved reading and writing. The control group received no treatment. The results demonstrate that the experimental group increased their reading and spelling skills significantly more than the control group. This study demonstrates that not only are computer programs effective, but following the intervention, an increase in student motivation was recognized due to the use of technology. Some of the students were very keen on using the computer programs or technology devices even after the intervention was ended. Similarly to Fasting and Lyster (2005), Coleman-Martin, Heller, Cihak, and Irvine (2005) explains that students who have never been able to work independently might be motivated by being able to do so using different technology devices. Their study investigated the use of computer assisted instruction as an effective method to promote word identification using the Nonverbal Reading Approach (NRA). With this approach “students are taught a metacognitive strategy using internal speech for decoding words” (p. 81). Three students with severe speech impairments and physical disabilities or

autism were provided decoding and word identification instruction using the NRA. The results indicated that all three students were able to reach criterion using the NRA.

The concept of technology as a motivator found by Fasting and Lyster (2005) was proven and confirmed in the study by Lee and Vail (2005). They examined the effectiveness of a computer program in teaching sight word recognition to four young children with developmental disabilities. With the idea that “current multimedia applications encourage children’s active participation, increase motivation and involve a variety of modalities” (p. 5), they carried out their investigation. They used a computer program that was developed based on a constant time delay teaching procedure and involved animations and video segments using cartoons. They found that the investigation was effective in teaching sight words to students with disabilities and not only did the technology individualize instruction but it also increased children’s motivation to read. Beechler and Williams (2012) state that “when using the computer in the classroom, teachers have yet another resource that appeals to most students” (p. 91). Students are motivated to use technology which allows for multi-sensory interactive features. Specifically to their study, “using computers to assist ESL (English as a Second Language) students learn basic sight words is effective and enhances motivation” (p.91). To a population that already find difficulties in reading due to their language barrier, motivation is a way students may overcome their reading difficulties if they are engaged and involved in their learning. Their study measured the results of using computer assisted instruction with early elementary students when developing their knowledge of sight words. The participants in their study were 26 English Language Learning (ELL) students in the primary grades. The method for practicing high frequency word in this study was through a website. The website contained audio flashcards and games. It offered visual

and auditory cues to enhance their practice. The study's results "suggest that the students demonstrated an increase in word recognition skills when computer assisted instruction augmented regular classroom teaching for ten minutes daily over two week period" (p. 90). With continuous practice in addition to the classroom instruction, technology can benefit students. Technology allows students of multiple needs and abilities to find success as it encompasses interactive, visually stimulating, motivating features.

Similar to the computer programs implemented in classrooms and studies, Smartboards were also implemented to see its effects on student motivation. Smartboards are interactive whiteboards that are implemented into classrooms all over the nation to increase student participation and motivation. They operate as a large touch screen in which students can manipulate and write on. Studies have been done using this technology to investigate its effects on students' high frequency word recognition. Mechling, Gast, and Krupa (2007) studies the effects of Smartboard technology as an interactive electronic whiteboard and a three second time delay for teaching sight word reading to students with disabilities. Results support the use of this tool to teach multiple students at one time and its effects on observational learning as a motivational way to learn other students' target words as they observe in addition to their own target words. Unlike the Mechling, Gast, and Krupa (2007) study, Mechling, Gast, and Thompson (2008) examined only the feature of presenting information on a large screen not the interactive feature of whiteboard technology. Their study focused only on projecting information onto the Smartboard instead of using the Smartboard's interactive whiteboard features as Mechling, Gast, and Krupa (2007) did in their study.

Following the Mechling, Gast, and Thompson (2008) study on the effects of using SMART board technology versus the flash card approach when teaching high frequency words, each student was asked questions following the study based on the methods used. If their response was learning to read new words on the SMART Board, they were then asked “Why did you like the SMART Board?” (p. 43). The responses were positive to using the SMART Board to learn new words: “It’s easy,” “I can see the words,” “fun,” and “computer, because I can do other things with it” (p. 43). “Motivational and engaging features of technology may further support students’ preferences to use such an interactive medium over traditional formats for delivering instruction” (Mechling, Gast, & Thompson, 2008, p. 45). When teachers provide students with the opportunity to learn through the use appropriate technology, students become motivated to take on an active role in their learning. Students learn best when they are involved and actively engaged.

### **Participating Students within the Studies**

The third common theme found among the scholarly articles examines the student population participating in the studies. The research analyzed various student ability groups including students at-risk, students who are English Language Learners, and students with disabilities. When generalizing the scholarly articles as a whole, not only did the research analyze the student abilities, but it also examined the student setting whether they were learning or practicing in a small group, whole group or one-on-one. Both ability grouping and student setting are important to examine as they demonstrate how students with a vast range in abilities learn differently which requires differentiation instruction and practice using available technological resources.

Both Bliss, Skinner, and Adams (2006), and Beechler and Williams (2012) studied the effects technology had on English Language Learning (ELL) students, also referred to as English as a Second Language (ESL). “Typical second language learners take approximately two years to become fluent on a social level but can take up to five to ten years to gain academic proficiency” which is why it is important to try to compensate the lost years by using available resources such as technology (Beechler & Williams, 2012, p. 85). It is important for teachers to implement technology as a way to compensate this time for ESL and ELL learners. When student’s primary language is one other than English, they are often placed in schools that differ in their primary language. Technology can be used as an avenue to bridge the gap between time and language differences.

Bliss, Skinner, and Adams (2006) investigated the effects of a modified taped-words intervention on high frequency word reading with a student who speaks English as a second language. He participated in a self-managed intervention in which he heard and repeated 30 high frequency words before the time delay. For this method the student heard and repeated the words allowing him to correctly articulate the words. English is not his primary language so this method is a great choice allowing for auditory and oral replication.

Beechler and Williams (2012) studies the effects of computer assisted instruction of high frequency words with 26 ESL students as mentioned previously. Both studies found that time delay tape words intervention (Bliss, Skinner, & Adams, 2006) and computer assisted instruction (Beechler & Williams, 2012) coupled with traditional methods help ESL or ELL students perform at grade level faster than traditional methods alone. Both studies found the ESL/ELL

participants increased their high frequency word recognition skills when each instruction/intervention was implemented.

Technology can also have a positive impact on students with disabilities. Technology can serve as an outlet to students with disabilities as it offers visual, kinesthetic, and auditory features. Some students may be non-verbal or have severe physical disabilities making them unable to complete academic or environmental tasks. Multiple studies have been done to determine the effects technology can have on students with disabilities when learning or practicing high frequency words. The participants included students with mental retardation, developmental and learning disabilities, autism, cerebral palsy and speech and language disabilities. Technology of various devices and programs may assist students with disabilities to “acquire skills not possible without more resources and time” (Baumgart & Van Wallegghem, 1987, p. 56). These devices and programs offer students with disabilities a multisensory, individualized and immediately tailored instruction and practice at the students learning pace. Results gained from the Baumgart and Van Wallegghem (1987) study differed from that of other study results mentioned as the participants were older than typical students, they were adults with moderate handicaps. In terms of teaching sight words, younger students require more powerful reading instruction such as direct phonics and error instruction where older students no longer need such instruction to that intensity, they may require focus on real word sight words such as grocery words as they did in this study. Similar results indicate that both groups of participants, young and adult with disabilities benefit from technology to advance their high frequency word recognition. When reviewing and comparing multiple studies students with various disabilities showed

improvement and increased their high frequency word scores following instruction and/or intervention using technological methods.

It was proven in the studies that students with disabilities are more successful in learning and practicing high frequency words when the appropriate technology is incorporated. Technological methods were used to increase high frequency word recognition. Studies involving the SMART Board included, Mechling, Gast, and Krupa (2007), Mechling, Gast, and Thompson (2008). Studies involving Computer Assisted Instructional (CAI) programs included Coleman-Martin, Heller, Cihak, and Irvine (2005), Lee and Vail (2005), Baumgart and Van Wallegghem, (1987), and Beechler and Williams (2012). Studies involving time delay included Koury and Browder (1986), Stevens, Blackhurst, and Slaton (1991) and Bliss, Skinner, and Adams (2006). The results are clear in each of these studies in that the technological method used, helped students to increase their high frequency word recognition. It is recommended by Meadan, Stone, and Parette (2008) and Parette, Blum, Boeckmann, and Watts, (2009) that no more than three to four new words be selected for each day when teaching students with disabilities. In addition, it is also recommended that graphics be chosen which provide a visual cue regarding the meaning of the words in hopes to slowly allow for elimination of picture clues in the future.

The final group of students studied in determining the effects technology had on high frequency word recognition were students at-risk. Students who are at risk are students from “non-white and/or low socioeconomic status (SES) backgrounds, or who have difficulty learning to read” Parette, Blum, Boeckmann, and Watts, 2009, p. 393). These groups of students are the students who may have difficulty with development of emergent literacy skills and may not

benefit from traditional instructional strategies as they progress through school. Many of these children will require intensive reading interventions. Van Norman (2008) state that, “struggling readers often need frequent, systematic and repeated practice to master difficult or newly learned skills” (p. 97). Similar to the results found on students with disabilities, likewise it was found in two studies, that students who are at risk require technology as an assistive tool that is coupled with direct and explicit skill instruction to teach high frequency word recognition (Parette, Bum, Boeckmann, & Watts, 2009 and Meadan, Stoner, & Parette, 2008). When direct and explicit instruction is paired with technology, instruction can be differentiated and individualized to meet students’ needs through their multiple application and features.

Aside from the grouping of students based upon their abilities within the research, these students were also studied in different physical setting groupings including one on one, small group or whole group. Contrary to the belief that technology is preferred only on individual or small group interactions, it is found that presentations such as PowerPoint can enhance the teaching potential in delivering instruction to the entire class. Such “tools holds children’s attention and are both entertaining as well as instructional” (Parette, Blum, Boeckmann, & Watts, 2009, p. 399). Unlike Parette, Blum, Boeckmann, and Watts (2009) study, it can be stated that their findings are true with regards to specific student abilities. It cannot be said that this method of whole group technology instruction/presentation is successful for students with severe disabilities.

Students require learning instruction and technology devices or programs based upon their needs (Williams, Wright, Callaghan, and Coughlan, 2002). Based on the research found for the topic of using technology as a tool to increase students’ high frequency word recognition, it

was found that the majority of the studies included students with disabilities. As a result, it is important to note that the students with disabilities often require individualized instruction and benefit from technology individualized for their needs. Not only was it found that the majority of the research studied students with disabilities but it was also the majority of the research was administered in individualized settings where students used specific technology devices or programs to increase their high frequency word recognition.

Apart from individual instruction and/or practice, two studies researched the effects observational learning had on students seated together within a small group. Mechling, Gast, and Thompson (2008) describe observational learning as students who learn the target words of other students. Both Mechling, Gast, and Thompson (2008) and Mechling, Gast, and Krupa (2007) displayed mirroring results in that students with disabilities observing other students' target high frequency words through using a Smartboard, increased their own high frequency word recognition performance. All the students involved in the observational learning learned other students target words via Smartboard.

Each of the studies mentioned within the participating students theme, prove that students of ranging abilities require individualized instruction using technology devices or programs specific to their needs whether it is within an individual or small group setting. After reviewing each study it can be said that no two studies were exactly alike allowing us to view that there are multiple outlets in reaching students needs through using technology in instruction and practice. Technology should not be limited to one device or program nor should it be limited to specific individuals. It is the teachers' responsibility to get to know their students, to tap into their

interests and learning styles and use that to drive their instruction. It is important to use the available resources to do so.

## **Conclusion**

Word recognition is a skill that is needed for reading success. If students do not have or find difficulty acquiring the necessary skills to recognize high frequency words in text or in their community, they are likely to fall behind and will be at risk for academic failure. It is up to each teacher to provide students with the appropriate method of instruction using the appropriate available resources. According to multiple researchers, technology is proven to be an effective and engaging tool to increase word recognition among students. When students of all ranges in abilities and needs are given the opportunity to learn and practice high frequency words through a variety of multimedia technology devices such as Smartboards, computer assisted programs, time delay presentations and voice recording; students are highly motivated through its interactive, engaging and appealing modalities (Baumgart, 1987). As technology advances, it is likely that this topic of using technology to teach and practice high frequency words will be continually studied and proven effective when compared to the traditional pencil and paper methods. As a reflective practitioner I will use the results gained from the research and compare them with the research I conduct on the topic of using technology to recognize high frequency words among students.

## **Method**

### **Context**

Research for this study will take place at a large “high needs” school district in the Finger Lakes Region in New York State. The New York State District Report Card for the 2010-2011 school year indicates that a total of 2,256 students were enrolled in grades Pre-Kindergarten through Grade 12. The student population in the 2010-2011 school year was made up of 60% White, 20% Black or African American, 18% Hispanic or Latino, and 2% Asian or Native Hawaiian/ Other Pacific Islander. Of this population, 56% were eligible for free or reduced lunch. This district operates four schools; the high school (Grades 9-12), the middle school (Grades 6-8), the intermediate school (Grades 3-5) and the primary school (Pre-Kindergarten through Grade 2). Research for this study will occur at the primary school. This school had 602 students enrolled for the 2010-2011 school year. The average class size was 17 students with eight to ten classes per grade level. This study will occur within two of the first grade classrooms. Both are inclusive classrooms containing 20 students in each. Students in these two classrooms receive various services which include, English as a Second Language (ESL), Consultant Teacher, Enrichment, Speech Therapy, Music Therapy, Occupational Therapy, Physical Therapy, Social Skills and Academic Intervention Service (AIS).

### **Participants**

The participants for this study will be nine first grade students who have IEP’s (Individualized Educational Plans) in which they are classified with a disability. Four of the students are in one classroom and five students are in another classroom. Each of the rooms has a General Education teacher, a part-time teacher’s aide and me, the Special Educator. My time as a special educator is divided equally each day among the two classrooms. Of the nine students, six are female, and three are male. In addition, the student demographics include four White, two

Hispanic, two African American and one multiracial. All nine students receive Consultant Teacher (Special Educator) five days a week for 30 minutes in Math and English Language Arts. Currently all students are reading at a level A which is the first level of the A-Z text gradient scale created by literacy experts Gay Su Pinnell and Irene Fountas.

Kenny (a pseudonym) is a white, six year old boy in first grade that enjoys being outdoors and listening to books read to him. He is classified with a Speech or Language Impairment and takes medication for attention deficit hyperactivity disorder (ADHD). He currently requires a 1:1 aide to support and assist him in age appropriate social skills, daily academics and safety. In addition to getting Consultant Teacher services, he receives Occupational Therapy, Speech/Language Therapy, and Physical Therapy. Kenny displays significant delays in the areas of expressive language specifically in the areas of vocabulary, grammar and social language skills. He requires a small group setting for learning to help him process new information. He finds success with a consistent routine, structure and rules.

Ian (a pseudonym) is a multiracial, six year old boy in first grade that enjoys working on the computers and is very social with peers and adults. He is classified with a Speech and Language Impairment due to his limited expressive and receptive skills. In addition to getting Consultant Teacher services, he receives Occupational Therapy, and Speech/Language Therapy. He has significant delays in speech, language, motor and attentional skills. Ian's academics are impacted by his defiant and impulsive behavior. He is often easily distracted and disruptive during large group activities. He requires 1:1 or small group settings where adult and peer modeling are present.

Ava (a pseudonym) is a white, seven year old girl in first grade that loves to play outdoors. She is classified with a Speech and Language Impairment due to her significant delays in speech and language skills. In addition to getting Consultant Teacher services, she receives Speech/Language Therapy, Occupational Therapy, and Physical Therapy. Ava needs a structured learning environment which will allow her to follow classroom rules, expectations and routines independently. She needs verbal prompting during large group activities in order to remain engaged and focused. Ava benefits and learns best when working individually or in small groups. She also continues to benefit from a language enriched environment in which she is encouraged to expand her verbal responses to four or more word sentence structures when asked wh-questions.

Nicole (a pseudonym) is a African American, six year old girl in first grade that enjoys playing with her friends and participating in activities where she always tries her best. She is classified with a Speech and Language Impairment. In addition to getting Consultant Teacher services, she receives Speech/Language Therapy and Occupational Therapy. Nicole is currently performing below grade level expectations in both math and literacy and has a significant delay in motor, attentional and language skills which affect her academic performance. She requires 1:1 support to accurately complete all academic tasks. Nicole learns best from a multi-sensory hands on and language rich environment.

Ella (a pseudonym) is a Hispanic, seven year old girl that is in first grade. She is a hard worker and enjoys school. Ella is classified with a Speech and Language Impairment. In addition to getting Consultant Teacher services, she receives Speech and Language Therapy. Ella has a significant delay in reading, decoding and speech/language skills which adversely affect her

academic performance. She benefits from small group settings, directions and information that is simple, clear and repeated.

Molly (a pseudonym) is a white, seven year old girl in first grade that enjoys cheerleading and animals. She is classified with Multiple Disabilities. She is a student born with Trisomy 21 Down Syndrome and has low muscle tone. She wears orthotics and glasses daily. Molly requires a 1:1 aide to assist her in navigating safely and also in all academic areas. In addition to getting Consultant Teacher services, Molly receives Music Therapy, Speech/Language Therapy, Physical Therapy, and Occupational Therapy. She is performing significantly below grade level but is making gains in her academics. When an activity can be paired with music she is more cooperative and motivated to complete her work.

Eddy (a pseudonym) is a Hispanic, six year old boy in first grade that enjoys listening to stories and working on the computers. Eddy is classified with a Speech and Language Impairment due to his significant language delay. Although he has made gains, his weak expressive and receptive language skills hinder his consistent progress in the classroom. In addition to getting Consultant Teacher services, he receives Speech/Language Therapy, Physical Therapy and Occupational Therapy. Eddy benefits from visuals, modeling and a structured environment where expectations and consequences are clear.

Emily (a pseudonym) is a white, seven year old girl in first grade that enjoys participating in all learning activities and is a great helper. She is classified with a Speech and Language Impairment due to her severe articulation, expressive and receptive language delays. In addition to getting Consultant Teacher services, she receives Speech/Language Therapy, Occupational Therapy and Physical Therapy. She is currently performing below grade level however has made

academic gains from the previous year. Emily is comfortable learning and interacting in both small and large group settings.

Abby (a pseudonym) is an African American, six year old girl in first grade that likes to be a helper and is caring towards others. She is classified with a Speech and Language Impairment. In addition to getting Consultant Teacher services, Abby receives Speech and Language Therapy. She is functioning below grade level in all areas. Her weak language skills are affecting her progress and success within the classroom. She often needs moderate 1:1 support and redirection in order to complete tasks. She benefits from directions that are repeated and consistent checks for understanding. Abby also benefits from visuals and extra time to process information.

### **Researcher Stance**

I am currently in my first year teaching Special Education. In addition to teaching, I am a graduate student at St. John Fisher College working towards obtaining a Master's Degree in Literacy Education Birth-Grade 6. I presently am dually certified in Childhood and Special Education with a minor in Instructional Technology.

This study will be conducted in the two first grade classroom in which I service students in. As a special education teacher, my responsibilities include servicing students with IEPs in two first grade classrooms. Each day my time is split between both classrooms to assure required servicing time is met. Specifically I service students in Math and ELA. I modify and accommodate students' first grade academics to meet each students needs in addition to working on achieving their annual goals listed on their IEPs.

Throughout the data collection, I will play the role of active participant observer. According to Mills (2011), an active participant observer is actively involved and engages in teaching. Teachers then observe the outcomes based on their instruction. As a special educator, I play this role of instructing students and using the outcomes to drive my instruction. This role will impact my research in many ways. As a teacher, I will be familiar with the students who I will be working with for this study. As a result, I will need to adjust the high frequency words used based on high frequency words individual students do not know in order to demonstrate growth throughout this study.

### **Method**

During this study, I compared methods of increasing high frequency word recognition: technology versus flash cards on students with disabilities. I implemented technology into instruction to see its effects on students' high frequency word recognition. The technology that I utilized was an Apple iPad with multiple applications to learn and practice recognizing high frequency words. To begin the study, I administered a student questionnaire that consisted of six questions. The student responses were recorded for the student. Their responses helped me understand their prior and background knowledge about technology and high frequency words (Table 1-5).

Following the questionnaire, I administered a self-made pre-assessment (Table 6) of twenty first grade sight words. Some of the high frequency words on the first grade list are also on the kindergarten list (a, I, is, me, etc.). Because I am their teacher and have been working with them since September, the first grade list is appropriate for all of my students as they are still learning to master the kindergarten list. Since students range in abilities, words were chosen

based off words they did not recognize from the pre-assessment. Five words were chosen. I chose one familiar and four unfamiliar words to use during this study for each student. I decided to use one familiar word to build their confidence. If they start off knowing one high frequency word from the list, they will hopefully have a positive attitude to continue with the unknown words.

Table 6

*Pre-assessment Word List*

---

a	go
in	to
look	and
so	he
like	me
at	I
the	do
on	see
it	went
with	no

---

Table 6-A

*iPad Group Target Words*

---

Student	4 Target Unknown Words	1 Known
Kenny	me, like, so, at	can
Eddy	be, so, if, with	at

Student	4 Target Unknown Words	1 Known
Ian	and, look, go, he	the
Ava	I, me, go, no	a
Molly	go, in, to, so	a

Table 6-B

*Flash Card Group Word List*

Student	4 Target Unknown Words	1 Known
Abby	be, it, on went	like
Emily	he, on, so, me	go
Ella	do, to, so, the	see
Nicole	no, me, go, to	a

Following the pre-assessment, I will place each student in a group; either in the iPad group (experimental group) or the flash card group (control group). I will be working with each student once a week. A weekly schedule will be made to display when each students sessions will take place.

Week 1 (10/8): questionnaire, pre-assessment, put into groups, chose target words

Week 2 (10/15): teaching target words

Week 3 (10/22): teaching target words

Week 4 (10/29): post assessment, interview

I will be working with two students per day except Fridays in which I will be working with one student. There will be four sessions for each student, in which each session will last about 10 minutes. During this time, I will be using either the iPad or the flash cards depending on the chosen method of the specific student. Also, I will be taking quick anecdotal observation notes

on student behaviors and successes with the target words. The goal is for students to be able to read all five target words by the end of the study.

The traditional flash card method will consist of five unknown and one known high frequency words from the first grade high frequency word list. One high frequency word will be placed on each flash card. For the first session after the pre-assessment, I will say the word, then ask the student to repeat the word. After they repeat the word, I will say “good” and repeat the word. If they say the word incorrectly, I will ask them to try again. For example:

**Me:** “This is the word \_\_\_\_\_.”

**Me:** “You say \_\_\_\_\_.”

**Student:** “ \_\_\_\_\_.”

**Me:** “Good, this is the word \_\_\_\_\_.” (If correct word is said, if not, ask to try again).

The experimental group will consist of using the iPad to learn and practice four unknown and one known high frequency words. Each target word will be taught and practiced using multiple apps on the iPad. Similar to the flash cards, the group of students working with the iPad will be able to see and hear the word. They will get the opportunity to respond and practice saying the word.

After the third session, the fourth and final session will consist of the post assessment. This assessment will mirror the first session pre-assessment to demonstrate the effectiveness each method had on students’ high frequency word recognition. As a post-assessment, students will be asked to recall each high frequency words on their target word list. Results will be observed and noted. These results will be used and examined as a method of data collection. During the final session, in addition to the post assessment, the students will also be interviewed.

I will ask each student a series of questions informally about their thoughts on using the iPad and learning new high frequency words. Similar to the questionnaire given at the beginning of the study, the interview questions will allow me to view how their thoughts and perspectives may change following the study (see Tables 7-11).

### **Quality and Credibility of Research**

During this study, it is crucial that I carry out research that encompasses credibility, transferability, dependability and confirmability. Trustworthiness can be established if those four characteristics are addressed in the study (Mills, 2011). Credibility is defined by Mills (2011) 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). To attain credibility, I worked with a critical colleague throughout the course of the semester. This method is known as “peer debriefing” (p. 104). My critical colleague and I met once a week to discuss and reflect on our own situations by listening, prompting and recording our insights throughout the research process. My research study will also include credibility as I will be working with students who I teach. The research will be conducted in the two classrooms in which I service my students in.

As suggested by Mills (2011), I will “practice triangulation” as a method to obtain credibility (p. 104). As Mills (2011) describes, triangulation “is the desire to use multiple sources of data” in order to cross-check data (p. 92). There are multiple tools that I will use to collect data to experience, enquire and examine. I will be experiencing through being an active participant observer. As the participants’ teacher, I will be actively engaged in teaching and observing the outcomes. I will be enquiring through student questionnaires and informal interviews prior and following the data collection. The questionnaires and interview questions

will be asked to the participants and I will record their responses following each question.

Finally, I will be examining the data through artifacts. The artifact that will be examined will be pre and post high frequency word assessment results. These results will allow me to view effectiveness of technology versus traditional flash card method on improving high frequency word recognition. By experiencing, enquiring, and examining, the data will be cross checked and triangulation will be achieved (Mills, 2011).

In addition to credibility, I will attain transferability in my research. “Transferability refers to qualitative researchers’ beliefs that everything they study is context bound and that the goal of their work is not to develop “truth” statements that can be generalized to larger groups of people” (Mills, 2011, p. 104). Transferability applies to the audience: the reader. It invites the reader to connect their own experiences to the study. In order for me to attain transferability in my research, I will “collect detailed descriptive data” which will allow me to compare my contexts to contexts in other studies (Mills, p. 104). The detailed descriptions of the contexts will allow others to make judgments about how my contexts fit and relate to other contexts.

The third characteristic, dependability will also be achieved in my research. “Dependability refers to the stability of the data” (Mills, 2011, p. 104). It emphasizes the need for the researcher to take into consideration the changes that occur in the setting and how they affect the researchers approach. Similar to the triangulation process, I will overlap my methods. I will demonstrate dependability through using two or more methods in such a way that the weakness of one method is strengthened by another method (Mills). I will also establish an audit trail which will allow my critical colleague to examine the processes of data collection. This trail will be achieved through written descriptions, artifacts and assessment results (Mills).

The final characteristic addresses confirmability of the data that has been collected. To address this issue, triangulation and reflexivity will be practiced throughout my study. As previously discussed, triangulation allows multiple uses of data sources to be compared and cross checked with other data sources. Reflexibility will be achieved by revealing my assumptions and biases that may cause me to “formulate a set of questions in a particular way and to keep findings in a particular way” (Mills, 2011, p. 105) By examining the characteristics of credibility, transferability, dependability, and confirmability, trustworthiness of qualitative inquiry can and will be established in my study on the impact of high frequency word recognition through using technology. Specifically I will view the effects of using an iPad versus the traditional index card method as a way to increase students’ high frequency word recognition.

### **Informed Consent and Protecting the Rights of the Participants**

Before any data could be collected, it was necessary to obtain permission from any participants’ parents that are below third grade. Attached to the parental permission form that have been sent home with each student, I wrote a letter to the parents explaining what the form was and why they were receiving it. As described on the form, the study presents no risks and will benefit the students and myself by enabling me to obtain information that will allow me to adjust my instruction to meet the needs of the students as indicated by the research. Names and locations of the research will be changed to pseudonyms and all data will be held in a locked location. Verbal assent from the students was also obtained as a prerequisite to the study and is considered as half of the consent process.

### **Data Collection**

To practice triangulation, I collected data through three different methods during the six sessions with individual students. The first method of data collection was observing through actively participating. As the participants' special education teacher, I actively observed them as I taught. I observed the outcomes and monitored the effects of my teaching and adjusted my instruction accordingly (Mills, 2011). During this study, students learned and practiced high frequency words that were unfamiliar to them.

The second method of data collection that I did was through enquiring. As previously discussed, I enquired through student questionnaires and informal interviews. During the first session, I asked six questions to the students individually. I created these questions as a way to understand the students thoughts about using technology, if they have access at home, if they would like to use it in their classroom, if they think it will help them learn new words, where they can find sight words in their classroom and how do they learn or practice reading sight words at school. I recorded each of the students' responses following each question. Their responses gave insight of where they stood at the beginning of the study. On the last session, I administered an informal interview to the students individually. This post interview consisted of three questions (see Tables 7-11). I asked the students if they liked using the iPad and why, and if they had the chance to use iPads in their classroom more often, would it help them learn more words. Again, I recorded their responses after each question. The students' responses to these questions allowed me to hear their thoughts about the study and if they thought using the iPads were effective and motivating.

The third method of data collection was through artifacts. Each student's pre and post high frequency word assessment results were examined to consider the effectiveness of each

method used. I examined each student's pre and post results. I considered questions such as the following: did the students increase their word recognition by the end of the fourth session? Did the student read all target words correctly by the end of the study? Following that comparison, I examined and compared the overall effectiveness of the method groups: the flash card group versus the iPad group.

### **Data Analysis**

After collecting data for four weeks, I began to organize, score, and review what I have learned and started to draw conclusions about what my data meant. Both quantitative and qualitative data were collected throughout this study. First, I present the quantitative data, and then I present the qualitative data in themes. The quantitative data consisted of questionnaires/interviews, observations through anecdotal notes and high frequency word test results. I studied the responses from the student questionnaires (see Tables 1-5) which was administered during the first session to gain insight into their thinking about technology and sight words. Next, I typed up the anecdotal notes I took during my observation. Observations were made during the core ELA block. Each student was observed once a week during the four weeks. Observations of student behaviors, interactions, responses and feelings were recorded through anecdotal notes. Following typing up my observation notes, I scored the post-assessment. The students were informally given a test on the last session to demonstrate the gains made during the study. Students were required to read the five words: four target and one known. I scored the student by marking each word right or wrong. Students received credit for each word read correctly. The test result data was organized and put into tables based on the student grouping: ipad and flash cards. I took these scores and compared them to the pre-assessment the students took during the

first session (see Figure A-1 & Figure A-2). Finally, I studied the student responses from the post-assessment interview that took place during the last session (see Tables 7-11). The responses were studied to see how the students' thoughts and ideas may have changed following the study and were compared to the questionnaire administered during the first session.

After looking at the student questionnaires/interviews, observations and test results, I began to look for similarities and differences among the data collected. I then coded the data collected and found common themes. In doing so, it was important to find information that was consistent among the student grouping as well as with this first grade special education population in general. I looked closely at student responses from the questionnaire/interviews, observations and test results. The second analysis was to present my qualitative data collected in codes and categorize them into themes. The entire data set was read multiple times to identify themes, questions, and evidence. By reading my data multiple times, I was able to flag commonalities among the data through coding. My qualitative data will be presented through three common themes. The reoccurring themes that were found among my data were the following: technology motivates students, technology increases high frequency word recognition, and the impact technology can have on the population of students with disabilities.

### **Findings and Discussion**

Technology is a way for people to encompass and intertwine their multiple intelligences together allowing them to demonstrate endless possibilities not only in the real world but also in their academics. Technology allows students of all ages to be actively involved and engaged. Technology is a resource that schools adopt for their classrooms to allow for differentiation, motivation and success. Motivating students is an essential part in teaching. Teachers have the

power and can greatly enhance the classroom experience and student performance when students are motivated. By incorporating technology into the classroom, teachers can motivate students. Lee and Vail (2005) state the idea that “current multimedia applications encourage children’s active participation, increase motivation and involve a variety of modalities” (p. 5) By incorporating a variety of modalities into their learning and practicing of new words, they are more apt to respond and motivated to participate. My research investigates how technology can not only motivate students but also how it can increase students’ high frequency word recognition for students with disabilities. The themes that were found demonstrate how students are affected by the resources that are available to them. As previously mentioned, my data will be presented both quantitatively and qualitatively.

Tables 1-5 below represent the student responses from the pre-assessment questionnaire administered to all participating students during the first session. The pre-assessment questionnaire occurred individually at a small table in the back of the classroom. I explained to them that I was going to ask them questions about technology. My students all have a speech and/or language impairment. Because of their impairment, I formulated my questions in a certain manner. I generally made the questions yes or no with occasionally asking why. Before asking them the questions I knew asking them a detailed question was going to be very difficult and needed clear and specific questions.

Table 1 below demonstrates the percentage of students who like using technology. When the question “do you like using technology?” was asked, the students were required to reply either yes or no. Some students paused, in which I could tell that they needed me to clarify the word technology. I explained and gave examples of technology. “Some technology tools in our

classroom that we use are, our Smartboard, the computers, the telephone, etc” (Pre-Assessment Questionnaire, 2012).

Table 1

*Percentage Scores of Children’s Interest in Technology*

Pre-Assessment Questionnaire:	Percentages	
Question 1:	Yes	No
Do you like using technology?	100%	0%

Based on the table above, 100% of the participants replied with “yes,” they like using technology. They may have all replied with “yes” because they apply the technology examples given from the clarification to experiences they have had with those technologies. As I gave the examples, I pointed to the examples in the room for a visual connection. All students were looking to where I pointed (student observations, 2012). Students were able to apply auditory vocabulary to experiences they have had in the past. Some students responded with a simple “yes,” while others expanded on their responses. Some expanded responses included: “yes, my favorite is games and drawing,” “yes because I love to touch,” “yes because I like playing games,” and “yes, I like pointing and it’s fun” (Pre-Assessment Questionnaire, 2012).

Table 2 below demonstrates the percentage of students who use or have technology like a computer or iPad at home. When the question “do you have/use any technology like a computer or iPad at home?” was asked, the students were again required to reply with a yes or no response. I reminded them of the other examples of technology. I did not want to limit them to the two examples in the question.

Table 2

*Percentage of Children with Technology at Home*

Pre-Assessment Questionnaire:	Percentages	
Question 2:	Yes	No
Do you have/use any technology like a computer or iPad at home?	89%	11%

Based on the table above, the majority of the students replied with “yes” they either use or have technology at their home. 8 students or 89% of the students have or use technology at home. Students responded with examples of technology they use or have in their homes such as: TV, computer/laptop, iPad, cell phone, iPod, radio, PlayStation, and a CD player. One student (11% of the participants) does not use or have technology in her home. I did not confirm with what they use or have available to them in their homes, so their accuracy may or may not be 100% correct (Pre-Assessment Questionnaire, 2012).

Table 3 below demonstrates the percentage of students who would like to use an iPad in their classroom. When the question “would you like to use an iPad in your classroom?” was asked, the students were required to reply with either yes or no. At this point I had an iPad available to view for a visual.

Table 3

*Percentage of Children Wanting to Use an iPad*

Pre-Assessment Questionnaire:	Percentages	
Question 3:	Yes	No
Would you like to use an iPad in your classroom?	100%	0%

Based on the table above, 100% of the participants replied with “yes” they would like to use an iPad in their classroom. Again, I believe they have connected with the iPad as a visual to positive experiences they have had in the past. Also, I believe they would like to take on a new experience and opportunity to use a new technology into their learning. 4 students expanded upon their “yes” response. The expanded responses included, “yes it’s fun!” “yes, play games.” “yes because it’s very fun and I would love it.” “yes it’s my favorite” (Pre-Assessment Questionnaire, 2012).

Table 4 below demonstrates the percentage of students who thought the iPad would help them learn new words. When the question “do you think the iPad will help you learn new words? If yes, how?” was asked, the students were required to reply with a yes or no response, and if they responded with yes, they were asked how.

Table 4

*Percentage of Children Thinking the iPad Will Help Them Learn New Words*

Pre-Assessment Questionnaire:	Percentages	
Question 4:	Yes	No
Do you think the iPad will help you learn new words? If yes, how?	100%	0%

Based on the table above, 100% of the participants replied with “yes” they thought the iPad would help them learn new words. I followed up by asking “how would the iPad help you learn new words?” Common responses include: “it’s fun,” “I love it,” “it will help me,” “I can play games,” and “I can practice writing.” One student was not able to expand on how it would

help her learn new words, she just was sure that the iPad would help her learn new words (Pre-Assessment Questionnaire, 2012).

Table 5 below demonstrates the percentage of students who responded with “word wall” as a location to where their sight words can be found in their classroom. This question did not require a yes or no response, but required a verbal or visual response from the students. Because this question required students to give a response other than a yes or no, they needed prompting. I often asked “hmm where in our classroom can you find sight words?” Together we looked around the room in search for sight words. This prompting helped students locate the sight words. If students pointed to the word wall, I asked them “what is that called?”

Table 5

Percentage of Children Locating Sight Words on the Word Wall

Pre-Assessment Questionnaire:	Percentages	
Question 5:	Word Wall	Other
Where can you find sight words in your classroom?	89%	11%

Based on the table above, 89% of the students gave responses that identified the “word wall” as a location with sight words in their classroom. Responses that I accepted for this percentage included: “word wall,” “mini word wall,” and “word chart.” The “other” percentage indicates the student who did not know where to locate the sight words, even with a visual prompt. Their responses helped me understand that the majority of the students know where to locate common words when they are reading or writing throughout the day. They may use this as a classroom resource (Pre-Assessment Questionnaire, 2012).

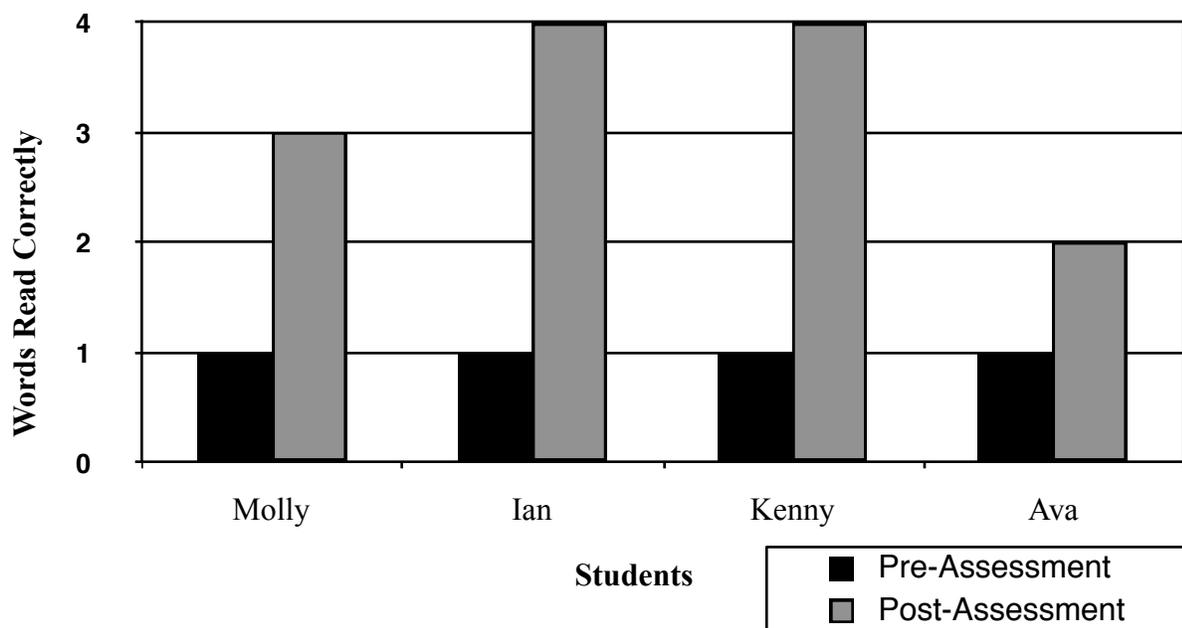
The sixth and final question on the pre-assessment questionnaire asked the participants “how do you learn or practice reading sight words at school?” Student responses were so varied that it was difficult to create a table. Student responses included “I don’t know,” “I write them, use magnets, word cards,” “make words, go through letters,” “teachers and sounds,” “write,” and “fun” (Pre-Assessment Questionnaire, 2012).

In further review and coding of the questionnaires, it was evident that this population of students participating responded for the most part as projected, in one to two word responses, and rarely responding in a full sentence. Questions were created based on pre-knowledge I have as their Special Education teacher. I knew they would find difficulty with questions requiring lengthy responses, which resulted in majority creating yes or no questions. When generalizing the pre-assessment questionnaire, it can be said that students wanted and were ready to incorporate technology (iPad) into their learning, specifically learning new words. Their responses mirrored and connected to the literature reviewed. Lee and Vail (2005) stated “Current multimedia applications encourage children’s active participation, increase motivation and involve a variety of modalities” (p. 5). In their investigation of incorporating technology into reading instruction, they found that the investigation was effective in teaching sight words to students with disabilities and not only did the technology individualize instruction but it also increased children’s motivation to read. The pre-assessment questionnaire allowed me to see where students stood before the target sight words were chosen and taught. It allowed me to view their thoughts and ideas on technology before using it. I was also able to judge the intensity I would need for each individual to master their target words based on the pre-assessment and questionnaire.

Following the pre-assessment questionnaire, pre-assessment, placing students in groups (flash card or iPad) and teaching the target sight words, I administered a post-assessment. The post-assessment resulted in asking the students to read their target/known words. It was done informally as my table but marked right or wrong. No hints or prompts were given. It was to clearly demonstrate whether they were able to read their target/known words by the end of the study or not. What was different from the post-assessment to the pre-assessment was that, the pre-assessment demonstrated the known sight words from the 20 word list. From there I was able to see the known versus the unknown words which is how they were selected as their target/known words. I used the pre-assessment to view unknown and used the post-assessment to view the known sight words.

The bar graph below compares the pre-assessment results to the post-assessment results.

**Figure A-1. Overall Student Performance Gains- iPad Group.**



*Figure A-1.* Overall Student Performance Gains- iPad Group. The bar graph displays students’ overall performance gains in the iPad group. The two bars for each student represent the

comparison of the pre and post assessment results. The vertical axis represents words read correctly. The horizontal line represents the students in this group.

Based on the results from Figure A-1, it is apparent that 100% of the participants in the iPad group demonstrated an increase in the words read correctly from the pre-assessment to post-assessment. The five students included in the iPad group consisted of Molly, Ian, Eddy, Kenny and Ava. Each of the students had their own set of target words. By each having their own set of target words, I was able to individualize instruction solely on the words that I wanted them to master by the end of the study.

Molly, demonstrated knowledge of 1 known sight word from the pre-assessment list. This word became her “known” word. Her known word was “a.” The target words chosen for Molly’s instruction included “go, in, to, so.” These words were taught and practiced during every instructional session. During the final session, I administered the post-assessment. Molly could read 2 of her target word and her “known” word, which resulting in 3 total word read correctly on the post-assessment. Of the target words chosen for Molly, she did not correctly read “go” and “in.” The same routine was done for the remainder of the students in the iPad group.

One of the words Ian read correctly became his “known” word which was “the.” The 4 target words chosen for Ian included “and, look, go, he.” These words were taught and practiced and during the final session they were assessed. Ian read 3 of his 4 target words and his “known” word correctly. The word Ian did not correctly read from his target word list included the word “and.”

One of the known words Eddy correctly read during the pre-assessment included “at” which became his 1 “known” word. The 4 target words chosen for Eddy as his target words included. “be, so, if, with.” These words were taught and practiced during the instructional

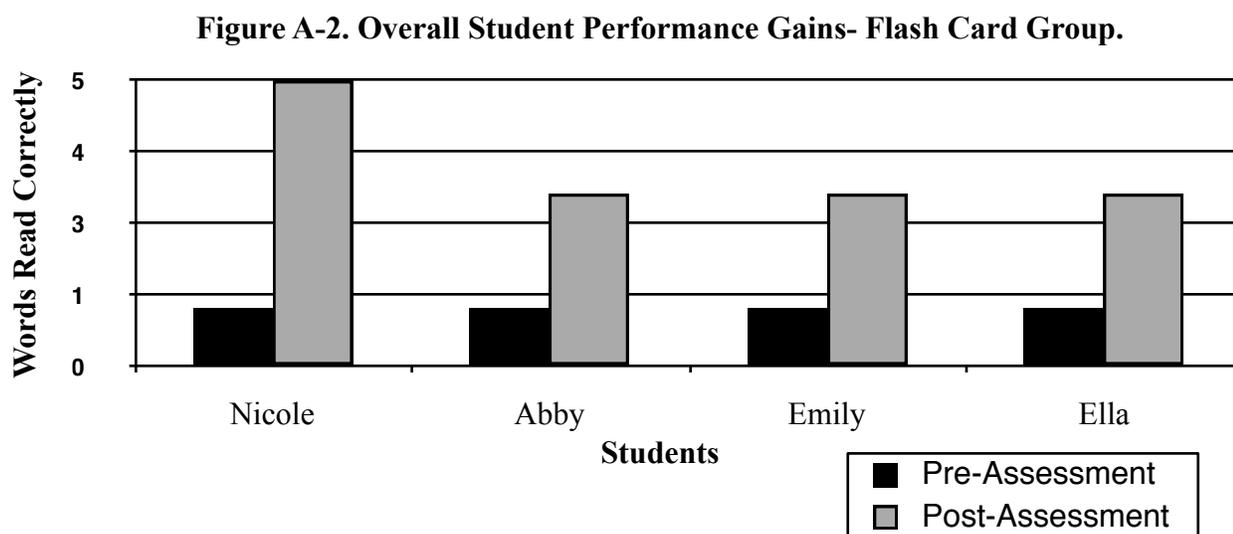
sessions and assessed on the final session. Eddy correctly read all 4 target words and his 1 known word resulting in a perfect score on the post-assessment!

On the pre-assessment Kenny read “can” correctly which resulted in “can” becoming his “known” word. The four target words that were chosen for Kenny included, “me, like, so, at.” These words were continuously practiced during the sessions and on the post-assessment they were tested. Kenny was able to read 3 out of the four target words chosen for him. He also continuously read the known word correctly. The word he did not read correctly from his target list was “so.”

On the pre-assessment Ava was able to only read one word from the list of 20 sight words. The word she was able to read is also a letter in the alphabet: a. This letter/sight word became her known since that was the only word she was able to correctly read. The four target words that were chosen for Ava included: “I, me, go, no.” As with the rest of the participants, these words were continuously practiced every session and tested during the last session. Ava was able to read 1 of the 4 target words from her list. She correctly read the word “I” and her “known” word “a.” She was not able to “read me, go, no.”

As a result and when looking at the iPad group as a whole, students in this group were able to read 18/25 words (72%). All of the students target and known words were combined and compared to the post assessment results to create the 72%. This percentage shows an increase in student reading achievement for the iPad group when comparing the pre-assessment to the post-assessment results.

Similar to the bar graph previously mentioned, the bar graph below compares the pre-assessment results to the post-assessment results with the second grouping of students. Figure A-2 demonstrates student's overall performance gain for the flash card group.



*Figure A-2.* Overall Student Performance Gains- Flash Card Group. The bar graph displays students' overall performance gains in the flash card group. The two bars for each student represent the comparison of the pre and post assessment results. The vertical axis represents words read correctly. The horizontal line represents the students in this group.

Based on the results from Figure A-2, it is apparent that 100% of the participants in the flash card group demonstrated an increase in the words read correctly from the pre-assessment to post-assessment, however not to the extent of the percentage the iPad group demonstrated. The four students included in the flash card group consisted of Nicole, Abby, Emily and Ella. Each of the students had their own set of target words. By each having their own set of target words, I was able to individualize instruction solely on the words that I wanted them to master by the end of the study.

Based on the pre-assessment results, one of the words read correctly and was chosen to be her "known" word for Nicole included "a." The four target words chosen for Nicole included "no, me, go, to." These were words she was not able to identify on the pre-assessment. These

words were taught and practiced during each session and were assessed on the last session.

Nicole was able to correctly read all 4 target words and her “known” word!

The “known” word chosen for Abby due to her ability to correctly read it during the pre-assessment included, “like.” The 4 target words chosen for her based on the words she was not able to identify during the pre-assessment included, “be, it, on, went.” These words were practiced during every session and tested on the last. Based on the post-assessment results, Abby was able to correctly read 3 of the 4 target words. She correctly read “be, it, went” and was unable to read “on.” She confused “no” for “on” which resulted her not getting credit for reading it correctly.

On the pre-assessment, one of the words Emily read correctly was “see.” This word became her “known” word. The four target words chosen for her included, “do, to, do, the.” The post-assessment results indicate that Emily was able to read 2 of her 4 target words. She correctly read “to, the” and her known word “see.” She was not able to read “do” and “so.”

One of the words Ella read correctly on the pre-assessment included “go” and became her known word. The four target words chosen for Ella included “he, on, so, me” These words were not initially read correctly on the pre-assessment however when tested during the post-assessment Ella was able to read 2 of the 4 correctly.

As a result and when looking at the flash card group as a whole, students in this group were able to read 14/25 words (70%). All of the students target and known words were combined and compared to the post assessment results to create the 70%. This percentage shows an increase in student reading achievement for the flash card group when comparing the pre-assessment to the post-assessment results.

It is evident that based on the results displayed in Figure A-1 and A-2, students increased their high frequency word recognition using either the iPad or the flash cards. It is extremely important to discuss that the group that demonstrated a greater increase in high frequency word recognition based on the pre-assessment results to the post-assessments results was the iPad group. The students within the iPad group showed a higher percentage increase when compared to the percentage the flash card group showed. Because students were learning and practicing the target sight words every week, the students should have demonstrated at least a one word increase in addition to the one “known” word if not more. Both bar graphs demonstrate that the students were successful in showing growth from the pre-assessment to the post-assessment.

The results from the assessments indicate an increase in students reading achievement when sight words were taught and practiced explicitly. Van Normal and Wood (2008) define explicit instruction as “the careful selection of materials that provide students with the appropriate level of scaffolding, feedback, practice and review to acquire new skills” (p. 96). Explicit instruction took place during my sessions with the students. I explicitly taught the target words and incorporated activities to practice in which feedback was given to make the words concrete and work towards mastery. By pre-assessing, instructing and post-assessing with different methods (iPad and flash cards) was an approach I took to individualize instruction for the population of students I teach. I understand their needs and learning styles so it was important for me to reach them in that respect. I used technology as way to assist my teaching so that they are supported in an appropriate way. The idea presented by Williams, Wright, Callaghan, and Coughlan (2002), that describes technology as a way to enable new ways of learning and teaching children with different learning styles and needs where traditional methods

may not always be appropriate or productive. This idea from the literature reviewed, mirrored what I found in my data. When traditional methods aren't appropriate, students may need alternatives. My data demonstrates that flash cards or other traditional methods do not always demonstrate reading success. My data demonstrates that by incorporating technology, learning styles are met as it offers multiple sensory features and motivating features.

The Tables 7-9 and 10-11 below represent the student responses from the post-assessment interview. Tables 7-9 was administered to students participating in the flash card group and Tables 10-11 was administered to the students in the iPad group. Two different post-assessments were given as a way to differentiate because the questions depended on the group the student was in. The post assessment was given during the last session with the student. The post-assessment interview occurred individually at a small table in the back of the classroom. I explained to them that I was going to ask them questions based on either the iPad or flash cards, depending which group they were in. Similar to the pre-assessment questionnaire, because of their impairment, I formulated my questions in a certain manner. I generally made the questions yes or no with occasionally asking why.

Table 7 below demonstrates the percentage of students who liked using the flash cards. When the question “did you like using the flash cards?” was asked, the students were required to reply either yes or no. If students responded with “yes” they had to explain why.

Table 7

*Percentage of Students Who Liked Using Flash Cards*

Post-Assessment Interview:	Percentages	
Question 1:	Yes	No

Did you like using flash cards?	75%	25%
Why		

Based on the table above, 75% of the students in the flash card group liked using the flash cards. 25% or 1 person in this group did not like using the flash cards. Students who responded with “yes,” they enjoyed using the flash cards explained that it was “fun because they got it say them” “yes because I like it, it’s my favorite color” (the words on the flash cards were written in purple). One student could not explain why she liked using the flash cards. The one student that did not like using the flash cards explained that “it’s boring” (Post-Assessment Interview, 2012).

Table 8 below demonstrates the percentage of students who thought the flash cards helped them learn and practice reading sight words. This question asked students to respond with either yes or no.

Table 8

*Percentage of Students Who Thought Flash Cards Helped Them Learn and Practice Reading Words*

Post-Assessment Interview	Percentages	
Question 2:	Yes	No
Does using the flash cards help you learn and practice reading words?	75%	25%

Based on the table above, 75% or 3 of the 4 students in the flash card group believed the flash cards helped them learn and practice reading sight words. 25% or 1 student in this group believed that this method did not help them learn or practice reading words. It is interesting that Ella states that the flash cards did not help her learn or practice reading words because she

actually increased her reading achievement by the end of the study. She was able to read 2 of the 4 target words. I would be interested to hear her clarification. I wonder if she meant in comparison to those who used the iPad. Maybe she meant that the iPad would help her learn and practice reading words more than the flash cards did (Post-Assessment Interview 2012).

Table 9 below demonstrates the percentage of students that said they would rather use flash cards or iPad to learn and practice reading words.

Table 9

*Percentage of Students Who Chose Flash Cards or iPad to Learn and Practice Reading Words*

Post-Assessment Interview:	Percentages	
Question 3:	Flash Cards	iPad
Would you rather use flash cards or the iPad to learn and practice reading words?	0%	100%

Based on the table above, 100% of the students in the flash card group would rather use the iPad over flash cards to learn and practice reading words. When given the option of which they would prefer to use, no one chose flash cards. I found their decision of not choosing flash cards not surprising as students today in the twenty-first century are much more technology savvy and prefer multi-sensory tools over basic pen and paper (flash cards) to practice reading high frequency words. I chose to ask this question last to keep their focus on the flash cards for the first questions. I believe if I was to mention the iPad in the first two questions, their responses may have been altered because the first question asks if they liked using the flash cards. If I mentioned the iPad, I believe their responses would have changed from yes they like using the flash cards to no, because of its limitations (Post-Assessment Interview, 2012).

Table 10 below demonstrates the percentage of students in the iPad group that liked using the iPad during the study.

Table 10

*Percentage of Students Who Liked Using the iPad.*

Post-Assessment Interview:	Percentages	
Question 1:	Yes	No
Did you like using the iPad? Why?	100%	0%

Based on the table above, 100% of the students in the iPad card group liked using the iPad. Following their “yes” response, I wanted to know why which lead me to ask, “Why did you like using the iPad?” 3 students responded with “yes” but could not explain why. The other two students responses included: “yes, I liked playing,” and “yes the games.” Both of these responses did not surprise me. These responses demonstrate that students enjoy the features the iPad has. The iPad has the ability to learn and practice reading words through multiple applications. Not only did they use a digital flash card application but they also played interactive games that required them to read words throughout it. I was surprised by the fact that the other three could not think of why they liked using the iPad (Post-Assessment Interview, 2012).

Table 11 below demonstrates the percentage of students who would like to use the iPad more often in their classroom. This question only required students to answer with a yes or no response.

Table 11

*Percentage of Students Who Would Like To Use the Ipad More Often In Their Classroom*

Post-Assessment Interview:	Percentages	
Question 2:	Yes	No

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If we had the chance to use iPads in our classroom more often, do you think it would help you learn more words?	100%	0%
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Based on the table above, 100% of the students in the iPad card group said that if they had the chance to use the iPad in their classroom more often, that they think it would help them continue to learn more words. They liked using the iPad (Post-Assessment Interview, 2012).

It is evident that from both the two groups post-assessment interviews, students prefer to use the iPad as they believe it will benefit them when learning and practicing new words. It is also clear what both methods offer. The flash cards offer limited interaction and basic rote practice. The iPad encompasses “motivational and engaging features” which “support students’ preferences to use such an interactive medium over traditional formats for delivering instruction” (Mechling, Gast, & Thompson, 2008, p. 45). It is clear from the responses that when students are given the option of choosing either using the iPad or flash cards to learn and practice new sight words, they will choose the iPad.

In addition to putting the data that was collected into a quantitative format, I also was able to organize it into a qualitative format. The data collection method mirrored the quantitative in that I obtained questionnaires/interviews, observations and assessment results. This form of data was organized into three themes. The reoccurring themes that were found among my data were the following: technology motivates students, technology increases high frequency word recognition and the impact technology can have on the population of students with disabilities.

### **Technology Motivates Students**

Similar to the theme found in the literature, technology was also found as a student motivator in my data as well. As I reviewed observation notes and through the questionnaires/interviews, student motivation was a component that stood out. Student motivation directly connected to the review of literature in which other researchers found similar results. Lee and Vail (2005) state the idea that “current multimedia applications encourage children’s active participation, increase motivation and involve a variety of modalities” (p. 5). By incorporating a variety of modalities into their learning and practicing of new words, they are more apt to respond and motivated to participate. As stated by the students in the interview responses, students enjoyed using the iPad because they can touch, play, hear and write on it (personal interview, October 8, 2012). Based on their responses, all nine students would want to use the iPad in their classroom. Beechler and Williams (2012) state that “when using the computer in the classroom, teachers have yet another resource that appeals to most students” (p. 91). A similar response can be made when relating to my study. When using an iPad in the classroom, teachers have another resource that appeals to students. When I asked students to come work with me, their behaviors and body language were more alert and excited when the iPad was present and throughout the session. Students in the flash card group demonstrated different behaviors. They seemed fatigued, tired and not “in tune” with what we were doing. Of the students who were in the iPad group, 100% of them enjoyed working with the iPad (personal interview, October 8, 2012). Of the flash card group, 100% of the students enjoyed using the flash cards; however they were not asked to compare their thoughts to using the iPad if they could (personal interview, October 8). Based on the questionnaire/interview results and observations it is important to understand students motivations. With students different multiple intelligences, it is important to

key into them and learn about how they learn best. When a student is motivated, participation and achievement can be achieved within the classroom.

### **Technology Increase Students' High Frequency Word Recognition**

The second theme found among the data I collected was how technology can be used as an effective tool to increase students' high frequency word recognition. It is important that students increase their high frequency word recognition so they are able to expand their word knowledge bank to apply to when reading text. When students find success in reading common words found among all texts, sight words, they will demonstrate an increase in their reading achievement. My findings based on the post-assessment results mirrored the findings in the researched literature. Students demonstrate an increase in their high frequency word recognition when technology is implemented into instruction and practice. Specifically in Beechler and Williams (2012) study, they found that when high frequency words were placed on computerized flashcards they became more effective when computer assisted instruction was implemented into regular classroom teaching. The study results demonstrated an improvement in student performance and increase in word recognition skills through using such technology. My data demonstrates that when words were put on digital flashcards on the iPad, students showed greater success in reading their target words when compared to the group of students who read their words from flash cards.

During the first session, four target words were chosen for each student to use throughout the remainder of the study. These words chosen were words the student did not know during the first session. Throughout the sessions, the target words were taught and practiced. By the end of the study, on the last session, these target words were used during the post-assessment as a way

to test each student's growth from pre-assessment to post-assessment. Based on the assessment results 100% of the students within both groups demonstrated an increase in their high frequency word recognition however results differed in terms of percent increase. The iPad group demonstrated a higher percentage growth when comparing the assessment results. This group had an overall 72% increase where the flash card group had a 70% increase. These results demonstrate that technology can in fact increase students' high frequency word recognition. It can also be said that when comparing the students' results using the iPad to the students results using the flash cards, they are both effective tools however the iPad shows a greater effect over the flash cards in terms of increasing students high frequency word recognition.

My data results directly connect to the literature researched. Mechling, Gast and Thompson (2008) research has proven that using the Smartboard is more effective than using flash cards as a means of increasing students' high frequency word recognition. Similar to the data I collected students' high frequency word recognition increase due to the technology implemented into instruction. Similarly, Beechler and Williams (2012) found that when high frequency words were placed on computerized flashcards they became more effective when computer assisted instruction was implemented into regular classroom teaching. Both of our studies demonstrated an improvement in student performance and increase in word recognition skills through using technology.

### **The Impact Technology can have on Students with Disabilities**

The final theme found among my data is that of the student population participating in my study. All of the students participating in my study are in two integrated first grade classrooms and each are classified with a Speech and/or Language Impairment. All nine

participants currently all have an IEP. In addition to Consultant Teacher for ELA and Math, they receive other various services including Physical Therapy, Speech Therapy, Occupational Therapy, and Music Therapy. This group of students is all currently performing below grade level in all academic areas. By focusing my study on only students with disabilities, I was able to see the effects technology can have on this population. Technology can serve as a positive outlet for students with disabilities that are integrated into a general education classroom. Technology offers a multi-sensory approach to instruction by allowing visual, kinesthetic and auditory learners a way to learn as technology encompasses such features. Baumgart and Wallegem (1987) explain that devices and programs offer students with disabilities an individualized and immediately tailored instruction and practice at the students learning pace. Van Norman (2008) state that, “struggling readers often need frequent, systematic and repeated practice to master difficult or newly learned skills” (p. 97). When students are given the opportunity to use technology such as iPads they are given a chance to practice and relearn skills other students may not need to master literacy skills. Ipads are great ways for students to use and practice with while also in a fun and motivating features and apps. Based on the data collected throughout my study, the students with disabilities demonstrated a high motivation and achievement in reading their target words using an iPad when compared to the students who did not use the iPad (observation and interview, October, 2012).

In conclusion, my research has demonstrated that technology motivates students and students enjoy using it within their classroom. It was also found that not only does technology motivate students but it also is a great outlet for students, especially students with disabilities by increasing their reading achievement. Students who used the iPad showed a greater increase in

high frequency words read correctly when technology was implemented into instruction and practice. After discussing the three common found themes, it can be said that each one piggy back off the other. It is necessary that they all work together to demonstrate student reading achievement for students with disabilities. Technology is an effective differentiation tool which increases students' high frequency word recognition through its motivating features.

### **Implications**

This study found that technology benefits students, especially those with disabilities when it is incorporated into daily reading instruction as it allows for a multi-sensory learning environment. Lee and Vail (2005), Burns (2007) and Meadan, and Stoner and Parette (2008) believe high frequency or sight word reading is a skill that one needs to survive and is essential for independently living within a community. By incorporating effective high frequency word instruction, educators are providing a “comprehensive foundation for functional academics” (Burns, 2007, p. 250). High frequency word recognition becomes a stepping stone for reading and writing as they include words commonly used in texts. Based on the literature and data I collected throughout my research, I have found that by addressing difficulties people face through the culture as a disability theory, students are being impacted because homes and schools do not have the adequate resources necessary for students to progress at an acceptable rate. Those who are not making the necessary gains through traditional literacies could be making those gains with new literacies such as iPads. New literacies allows for transformation of instruction that is more inclusive for all students. This knowledge is important and beneficial to not only myself but also other educators as it gives insight to what the future may bring. As an

educator, it is important to always be working towards what in the students best interests and through the technology integration approach, students will be positively impacted.

Through the questionnaire/interview, student observations and assessment results, several implications can be made concluding this study. The first implication is that educators must be prepared to be flexible and adapt to the continuous changes in technology. It is important not only to locate available resources to use in classrooms but also know how to effectively use them as well. Technology offers powerful ways to provide and require students to have “multi-modal involvement” (Meaden, Stoner & Parette, 2008, p. 46). Educators must seek professional development to provide opportunities for students to expand and build upon their experiences beyond time and space constraints of conventional and old literacies.

The second implication is the need to differentiate instruction. As teachers provide appropriate technology as a means to differentiate literacy practice, they are providing the tools and support students need individually to improve their reading achievement. The diversity among students requires us to shape our instruction in a certain manner to meet the needs of each learner. When instruction becomes too difficult or too easy for a student, they will often lose focus, motivation and ambition to succeed. In my study, I was able to differentiate by using the pre-assessment results to pin-point words each student needed to master. Four words were chosen specifically for each individual student and taught during the following sessions. Students using the iPad took part in various literacy activities to learn and practice their target words. Activities were chosen to meet the needs of each student. Each activity allowed students the opportunity to explore and practice their words. The flash card group did not get the opportunity to play interactive multi-sensory activities due to the limited interaction flash cards allow.

### **Conclusion**

The research was conducted to further analyze the affect technology can have on student reading achievement. This study asked, how does technology, as a teacher assistive differentiation tool, increase students high frequency word recognition? This topic related the theories of new literacy and culture as a disability. Three common themes were found among the literature. The first theme discusses technology is an effective tool for identifying words automatically. The second theme discusses technology as a student motivator. The third and final theme describes how successful technology is when used with students who have disabilities.

It is important to not only review past research but also conduct my own research to observe how affective technology can be on students' high frequency word recognition. My research took place in Greenville, New York (pseudonym) with a group of nine students who are classified with a disability. These students were placed into two groups: experimental (iPad), and control (flash cards). The data was first presented quantitatively and then presented qualitatively in themes. Through the quantitative data collected through questionnaires/interviews, observations and test results, similar findings were observed to findings in the literature. The students who used the iPads read a higher percentage of their target words than the students who did not use the iPad and used flash cards. The findings demonstrate that there is a correlation between students with disabilities and using technology such as the iPad to increase high frequency word recognition. With such results teachers must use available resources such as technology to reach students individual needs and learning styles.

Based on my findings and data analysis, all nine participating students improved their high frequency word recognition using either the iPad or flash cards. It is evident that the iPad

group demonstrated a higher percentage of students were able to read their targeted high frequency words when compared to the flash card group. Through this study, I was provided with a classroom/instructional tool that allowed me not only to differentiate instruction but also motivate my struggling readers. The iPad not only proved beneficial to me as an educator but also to my students as well. I have found myself teaching and exposing other educators to the iPad as they view the students' motivation and reading success who participated in my study. It is encouraging to know that there are available resources in my district, however getting teachers to use them effectively and to their fullest potential is a hurdle due to time constraints.

As I reflect on my research, I think back on conflicts, struggles, and methods that could be done differently if this study was to take place again in the future. The end result that I expected from this study turned out how I projected: students who used the iPad increased their high frequency word recognition when compared to students who did not use the iPad. However, I was left with unexpected limitations. My research was conducted within two first grade integrated classrooms. I created the experimental and control groups by dividing both groups up, leaving me both classrooms using the two methods. In the future, I would have one classroom designated to use the iPad and the other classroom to use the flash cards. The reason I would designate classrooms would be because some students I worked with got jealous that they were not using the iPad because they were only using flash cards. They constantly asked me to do what the other children were doing using the iPad because it was "more fun" (student observation, October 9, 2012). Another limitation was the length of the study. My study lasted four weeks total; however after pre and post assessments, target word instruction only allowed for two weeks. In the future, I would stretch out the study to allow me more time working with

the students on their target words in hopes of demonstrating an even higher word recognition percentage.

The population I worked with was very small in size. I studied two groups of four or five student. Because of the small number of participating students, when a student was absent, which was very common, it may have severely affected my data because if they missed their session working with me, it was very difficult finding time to make it up. One of the students in the iPad group was absent a total of three times throughout the study which may have impacted the iPad groups percentage. That student may have been able to read more of his target words if he was not absent. The importance of attending school every day is not only important for this study's validity but also is extremely for their overall academic success, especially the special education population. This population is below grade level in general and when they are often absent they may fall further and further behind their peers.

This study has left me with many thoughts and questions. I would be interested to see the results of this study on a first grade general education population versus the first grade special education. I believe the outcomes would be similar in that the iPad group would demonstrate a greater high frequency word recognition percentage when compared to students who did not use the iPad. I would assume similar outcomes due to the endless possibilities the iPad offers when compared to basic flash cards.

In conclusion, it is crucial to note the correlation between students reading achievement to technology. Available resources can impact students' reading experiences. In order to be successful readers, students require teachers to be in tune with their learning styles as well as available resources to allow for more individualized instruction, especially for students with

disabilities. As educators we must recognize that no two students learn in exactly the same way, which is why it is crucial we get to know our students and find the necessary and appropriate tools including technology to accommodate them. We need to be creating positive and successful reading experiences as students with disabilities are a population of students who are usually academically below grade level. We must use available resources such as technology as a way to reach students individual needs and learning styles.

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**Appendix C**

Student Post-Assessment Interview  
(iPad Group)

1. Did you like using the iPad? Why?

2. If we had the chance to use iPads in our classroom more often, do you think it would help you learn more words?