

The Incorporation of Technology for Students with Significant Cognitive Disabilities

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Table of Contents

List of Tables	i
Abstract	ii
I. Introduction	1
Overview	2
Statement of Problem	3
Hypothesis	3
Operational Definitions	3
II. Review of the Literature	4
Using a Tablet	7
Using Computer-Assisted Instruction	8
Using E-books	9
III. Methods	11
Design	11
Participants	11
Instruments	12
Procedure	13
IV. Results	15
V. Discussion	17
Implications of Results	17
Threats to Validity	18
Relationship to Literature	19
Implications for Future Research	20

Conclusion	20
References	22

List of Tables

1. Comparing Students' Average Pre and Post Mean Scores	15
2. Average Pre and Posttest Scores	16

Abstract

The purpose of this study was to determine whether the incorporation of technology using e-books, web-based program and a tablet would affect the reading comprehension achievement of second and third graders in an alternative curriculum classroom. The measurement tool was an online pre- and posttest. The study involved the use of a pretest/posttest design to compare comprehension gains from March of 2018 (before the intervention was administered) to data from April of 2018 (after the intervention was complete). Achievement gains were not found to be statistically significant. Research in reading comprehension with students with significant cognitive disabilities should continue with larger populations over a longer period to determine means to best met their learning needs.

CHAPTER I

INTRODUCTION

Reading is an integral life-long skill that assists in independence in society.

Reading allows individuals to derive meaning from symbols. For most children reading can be a trying experience. Unfortunately for students with significant cognitive disabilities, this experience can be an arduous one. Teachers and parents need to work collaboratively to provide a rich literate environment.

Many techniques may need to be used such as websites, sight word cards with pictures and songs. Scaffolding is essential in process so that students have levels of prompting that lesson to aide in independence. A student with disabilities is easily captivated using technology to assistant in the acquisition of the reading and the comprehension of a read text. To read students, need to know the letter/sound relationships, and sight words. Using technological resources such as web-based programs, tablets, and e-books students with significant disabilities should be more engaging and therefore increase the abilities to learn how to read.

Teaching students with significant disabilities reading can be difficult; however, with current research the methods of web-based programs, tablets and e-books are backed by various studies. When using computer programs, students can complete learning at their own pace which is done at their own independent ability (Macaruso & Rodman, 2011). According to research using iPads to increase phonemic awareness, children with disabilities could receptively identify phonemes (Chai, Vail, & Ayres, 2015). E-books often intrigue students who are apprehensive about books that are in print (Morgan, 2013). It is important for teachers to utilized methods that

are proven especially with students with disabilities as it is imperative to help them gain the ability read and comprehend what is read.

If teachers do not use proven methods, students will struggle to gain reading knowledge. Teaching students with the latest Pinterest fads will not assist in creating the most well-round independent reader for students with disabilities. Teachers need to utilize effective methods that are well researched and proven to assist their students to achieve reading to the best of their abilities. Consistent instruction with explicit teaching is imperative to aide in success. Teachers need to have explicit teaching of letter-sound relationships, sight-words and reading comprehension strategies through reading of text.

This can happen in many ways but using small group instruction students can use hands-on methods to learn and then solidify their learning through technology. Teachers should teach sight words through instruction mixed with technology through programs such as Edmark or an interactive sight word program such as Boardmaker. Teachers should allow students to read the story using an iPad. Students should be exposed to explicit instruction on letter/letter-sound relationships and then allowed to utilize a web-based program such as Starfall to help this knowledge set in. The use of technology should help their reading acquisition rather than a specific component.

Overview

In this study, students who are having a difficulty demonstrating phonemic awareness, sight word acquisition and reading comprehension will be exposed to explicit teaching as well as web-based programs for phonemic awareness, sight words and e-books to aid in comprehension. These students will read the same guided reading book; however, they will use an e-book on the

iPad. The students will be able to use Starfall directly after reading rotations to assist in the acquisition of phoneme skills. The teacher will provide the use of an iPad to help with phoneme skills. A few of the students will be able to take part in the intervention Edmark which will work on sight words. The teacher will assess students' knowledge in comparison to their peers who will receive explicit instruction without the access to E-books, and use of iPad technology. The teacher will assess their growth through a pre- and post- curriculum assessment as well as their demonstration on comprehension questions of texts read over a month.

Statement of Problem

What will the incorporation of technology in relation to reading increase the acquisition of skills with students who have significant cognitive disabilities?

Hypothesis

The null hypothesis is there will be no statistically significant gain in incorporating technology with students with significant cognitive disabilities and explicit teaching.

Operational Definitions

E-book: a book that is made available with a digital form of text which can be displayed on any digital format.

Web- based program: a software that is available online and can be accessed using URL and needs not software installed.

Tablet: has a mobile operating system and have a touch screen which enables immediate feedback.

CHAPTER II

REVIEW OF THE LITERATURE

This literature review seeks to explore the impact of technology on students with significant cognitive disabilities. Section one provides an overview on technology in the classroom. Section two explores the use of a tablet. Section three provides an overview of computer-assisted technology. Section four provides an overview of e-books.

Overview of Technology in the Classroom

“We need technology in every classroom and in every student and teacher’s hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world” (Beilby, 2018, p.1). This quote shares the thought behind one instrumental practice that is driving instruction within the special education community. Students will learn when they are engaged, and technology can increase engagement (Kellems, Grigal, Unger, Simmons, Bauder & Williams, 2015). Expectations needs to be high for those with disabilities, technology is one way to help meet high expectations. Based off the quote from Beilby’s article as the amount and availability of technology increases in the world it is essential that teaching methods are pertinent to students and their learning styles.

Literacy is one critical development in school which incorporates print concepts, phonological awareness, phonics and word recognition, fluency, and reading comprehension. Print concepts start early-hopefully prior to the child entering school. These include: the ability to identify parts of a book, how to hold and turn the pages, how to interpret functional print such as a menu and signs and labeling of functional words that occur in the home or classroom environment. Another building block in foundational literacy is phonological awareness which can be described as the grasp of alliteration, rhyme, rhythm, the repetition of songs or poems,

breaking words into syllables, segmenting and blending words, and breaking sentences into words, identifying beginning, middle, and ending sounds. Based on an article from *Reading Psychology*, “numerous research studies have shown an important link between the development of phonological awareness and advancements in reading” (Macaruso & Rodman, 2011, p.172). The next step is to comprehend phonics which is the ability to hear, identify and manipulate phonemes and create them in the written form of words. From phonics and word recognition, children begin to develop a fluency for reading words. This is introduced by words that must be known by sight alone, then the addition of phonetical words. The complexity of this fluency increases as word knowledge and ability to decode increases. Fluency is tied to reading comprehension which is the final component of foundational literacy. Reading comprehension involves the ability to understand and make connections to what was read. Educators use scaffolding during the process of helping a child attain foundational literacy. “Scaffolding is a balance between obtaining and maintaining a child’s engagement, simplifying the task when needed, providing confidence for risk taking, marking relevant information and demonstrating potential solutions” (Coyne, Pisha, Dalton, Zeph & Smith, 2012, p.164). The use of scaffolding is important to create a successful learning environment for early learners. According to an article in *Research and Practice for Persons with Severe Disabilities*:

“The recent focus on improving literacy for all students, and legislation requiring the use of research-based practices to provide students with disabilities access to general curriculum content has raised the bar for literacy instruction for students with development disabilities. Many students with developmental disabilities may not yet be readers; however, students can learn (a) important early literacy skills (e.g. concepts of print, print knowledge, vocabulary acquisition and (b) listening comprehension through the content of grade-aligned materials” (Spooner, Ahlgrim-Dezell, Kemp-Inman & Wood, 2014, 30).

Along with this article, another article in *Focus on Exceptional Children* agrees and shares that students with disabilities can achieve “higher expectations” for learning (Knight, Browder, Agnello & Lee, 2010, p.1). The article in *Focus on Exceptional Children* also states that “the development of literacy skills provides a critical foundation for success at school and in adult life for all students, including those with severe developmental disabilities” (Knight et. al., 2010, p.3). Due to the critical nature of foundational literacy skills, it is imperative that students are engaged and reach their fullest potential by any means ethically possible.

One instructional means of achieving foundational literacy is the use of different technological resources such as web-based programs, tablets, and e-books. Some of these examples are touch based and engage a learner through a multisensory experience. This touch promotes active learning (Flewitt, Kucirkova, & Messer, 2014). Some theorists, such as Piaget believe touch and movement increase the ability to retain information presented. An article in the *Australian Journal of Language and Literacy*, stated “well-planned literacy-related iPad activities stimulated children’s motivation and concentration, and offered rich opportunities for communication, collaborative interaction, independent learning and enthusiastic learning dispositions” (Flewitt et. al., 2014, p.110). Providing technology within the classroom with young learners sets students up for success. According to an article in *Research and Practice for Persons with Severe Disabilities* this incorporation of technology prepares students for “future work endeavors” (Staples & Edmister, 2014, p.137). When students are engaged in technology they absorb more of the information that is presented to them than when compared to non-computer- based learning (Couse & Chen, 2010). It is a challenge for educators to effectively integrate technology into the curriculum, however, this must be done to increase student engagement and learning (Couse & Chen, 2010). When this integration takes place, the

children are actively engaged in their thinking (Couse & Chen, 2010). Teaching literacy skills to students with significant cognitive disabilities can be challenging. However, by supplementing traditional classroom methods with the abundant availability of technology students with special needs can make progress.

Using a Tablet

There are many ways to incorporate the use of technology in the classroom. Researchers have seen an increase in the student development of foundational literacy using a tablet, such as an iPad. Because of this research, a set of National Educational Standards for Students has been created. There are six Next Generation standards including: creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving and decision making; digital citizenship; technology operations and concepts (Couse & Chen, 2010). Using an iPad, a child can individually create original works to express themselves or collaborate with others to create a group project which can be displayed through technology (Couse & Chen, 2010). This researcher has been focused on older elementary-aged children, who are more capable of collaborating and displaying their knowledge using multimodal means of technology. A more current study done by Couse and Chen explored the use of technology with early childhood students. With younger, more severely disabled students teachers need to show the students how touch influences the program and what the result is of touch on the technology device. According to the *Australian Journal of Language and Literacy*, “the students’ deep engagement in this literacy activity appeared to be further enhanced by the inclusion of somatosensory stimulation in their writing, through physical touch (gently touching the smooth, solid surface of the iPad), vicarious touch (watching other students touching their iPads) and virtual touch (touching virtual objects on the iPad screen” (Flewitt et. al., 2014,

p.113). The tablet provides the ability to learn literacy through touch. One of the traditional activities done frequently in multi-sensory classroom is utilizing multi-modal means such as sand, paint, shaving cream, etc. to trace a letter. “With the iPad, tactile experience combined powerfully with immediate reward, such as a letter displayed on screen or read aloud by a pre-recorded voice, which enhanced children’s enjoyment and engagement” (Flewitt et. al., 2014, p.112). Based on research, incorporating tablet use within the classroom to increase foundational literacy is beneficial.

Using Computer-assisted Instruction

In addition to incorporating tablet use in the classroom, research shows incorporation of computer-assisted instruction or websites increases foundational literacy skills. When used as a supplemental form of instruction, students performed with greater ability than students who had only teacher-directed instruction (Chai et. al., 2015). In the study published in *The Journal of Special Education*, teachers would incorporate additional hands-on activities in the classroom that mimicked the touch and sound activity already experienced within the computer-assisted instruction. When interviewed, the students expressed that they enjoyed this activity (Chai et. al., 2015). Based on studies previously done, computer-assisted instruction may be motivating due to the pictures, animation and feedback (Macaruso & Rodman, 2011). This is specifically motivating to students in kindergarten and first grade who are establishing early reading skills. The reason this might be more motivating is due to the increased demands for higher foundational literacy skills in younger children (Macaruso & Rodman, 2011). Through the incorporation of computer-based instruction or websites in the teaching of foundational literacy skills there is a higher potential for an overall increase in reading performance (Macaruso & Rodman, 2011). The research on computer-assisted instruction has not limited to the United

States but worldwide. In the United Kingdom, there has been a push for teaching phonics systematically using computer-assisted instruction (Wild, 2009). The United Kingdom has proven there is an improvement in phonological skills using interactive instruction with a computer program or a website. In the global research field, it is known there is a benefit to incorporating phonological instruction with computer technology.

Using E-books

One final way to engage students is the use of e-books. This has been researched heavily. With e-books children have increased access of text. Research shows that the use of multimodal e-books improves comprehension (Morgan, 2013). The access is increased in an e-book due to the ability to learn through visual, auditory and kinesthetic formats (Morgan, 2013). When the students are exposed reading through e-books which can be displayed on an iPad or other interactive tablet, they hear noises other than the reading (i.e. a bear growling), music, and correct pronunciation of words (Morgan, 2013). A precautionary planning tip for teachers is to be careful about what e-books they choose so it is not too distracting for students (Morgan, 2013). Some e-books have questions within in the book with hot-spots which offer quick comprehension checks. E-books offer the opportunity for added support using assistive technology (Spooner et. al., 2014). According to Coyne, Pisha, Dalton, Zeph and Smith (2012), when e-books are included in a comprehensive reading program there are higher gains in comprehension. The incorporation of e-books into a high-quality reading program that is focusing on foundational literacy skills results in higher achievement rates (Coyne et. al., 2012).

Research has shown that the literacy skills in special education students need to be of the highest caliber to ensure their highest potential. The use of technology with younger special education students has only recently begun to develop. This is due to previous thinking that only

older students could utilize it. Using a tablet, students will have a multimodal learning experience which will further their grasp of fundamental literacy skills, creating life-long learners. This is especially important due to the Next Generation Technology standards that have been created. Using computer-assisted instruction to supplement dynamic teaching has been proven through world-wide studies to be motivating in special education students. Finally, e-books used in a touch-based tablet have been proven to increase the access of the text and response when used along with a comprehensive reading program. Based on the research shown, integrating technology into a dynamic reading program by using tablets, websites/computer-assisted instruction and e-books, should increase literacy development in significantly disabled Kindergarten and First grade students.

CHAPTER III

METHODS

This study used a quasi-experiment design to examine whether the incorporation of technology for students with significant cognitive disabilities increases achievement in the areas of reading comprehension. The null hypothesis that incorporation of technology will have no significant impact on curriculum assessments for students with significant cognitive disabilities was used to test this design.

Design

This quasi-experimental study utilized pre-post data design that consisted of collecting data on student's reading comprehension using a pre-test prior to the months unit and collecting the same unit after the intervention. The independent variable was identified as the technology incorporated curriculum taught during reading. The dependent variable was identified as the students' knowledge based off the curriculum assessments. This study was only 5 weeks; therefore, the pre-data was assessed prior to the unit while the post-data was taken after the unit was complete.

Participants

The participants in this study were from a public school in the mid-Atlantic region from a mid-size area. Participants were chosen based on the class they were in. Each participant was placed in the classroom based on their significant cognitive disabilities which placed them inside a classroom with limited access to their general education peers. In this group of students five of the eight students have Behavior Intervention Plans (BIP). The behavior intervention plans are based on each child's needs and list ways to help them effectively learn. The BIPs identify the function of the behaviors and list strategies to help address the behaviors. Three of the eight

students are in the third grade and attend lunch, recess and cultural arts with their general education peers which includes: computer, media, art, physical education and music. The other five of the eight students are in the second grade and attend all lunch, recess and cultural arts times with their peers. This classroom is defined as an Alternative Curriculum Classroom which teaches alternative common core state connectors which link to the curriculum. The goal of our program is to build independence and link the each of students needs to the curriculum. Part of participants schedule includes a place where they are asked to independently complete tasks such as matching, sorting and sequencing items. The student's curriculum is linked to their Individual Education Plans which varies. The students' disability codes range: four of the eight have multiple disabilities which include identical disability, autism, cerebral palsy, multiple congenial cognitive abnormalities, one student is diagnosed with a profound intellectual disability, two are have the disability code of Autism, one has the code of other health impairment. Three of the students are eligible for free and reduced meals. Three of the students in the study are eligible for Medicaid billing. Of the eight students, two are African American and two are from Middle Eastern countries. Of the eight students in the study, all requires various multi-modal means of communication which means they need the use of pictures/words to communicate. Three of the eight students required an augmentative communication device to communicate. One of the eight students use eye gaze technology.

Instrument

The participants in this study utilize many forms of technology. The curriculum provided by the county has a pre/post monthly curriculum assessment. Teachers enter input the students learning profile at the beginning of the year based on their IEP goals and modes of communication. Students receive a learning profile of either 1 which is a student is not

successful at demonstrating knowledge, 2 which is a student who can consistently demonstrating some knowledge, and 3 which is a student who can always demonstrate learning. The students receive the same basic test no matter what their level. This test is the same for pre/post data point. The test has six questions which discussing basic vocabulary and concepts that will be taught the entire unit which is a period of four weeks. The test is given on an iPad in a one on one setting. The teacher reads the assessment question and the student sees visual questions like items they will see in the unit. There is a field of 3 questions with visual components. The students are presented the question can select with their finger the choice. If they are incorrect the field of answer choices will move to two before moving to the next question. If the student picks the correct answer the student reaches two points. When the field is lowered to two answer choices and the student picks the correct answer, the student will receive one point. The test assesses vocabulary, identification of concepts taught in the specific unit, letter/sounds, characters and comprehension questions.

Procedure

Every month pre/post tests are given to each of the students. The study started on March 5th, 2018. The unit start which focused on weather including seasons, different weather apparel, what weather looks likes, and what changes in seasons do to the environment. All students were tested in the first week of the unit. The lessons take place in an encompassing fashion. The students learn about weather in reading, language arts, science, social studies, writing and math. The lessons build upon themselves. The students with significant difficulties with sight words and sounds are provided the opportunity to have access throughout the unit on the computer during independent time to explore an online web-based software to improve their skills. After 4

weeks of teaching the unit the post-test was administered. The post-test is the exact same as the pre-test.

CHAPTER IV

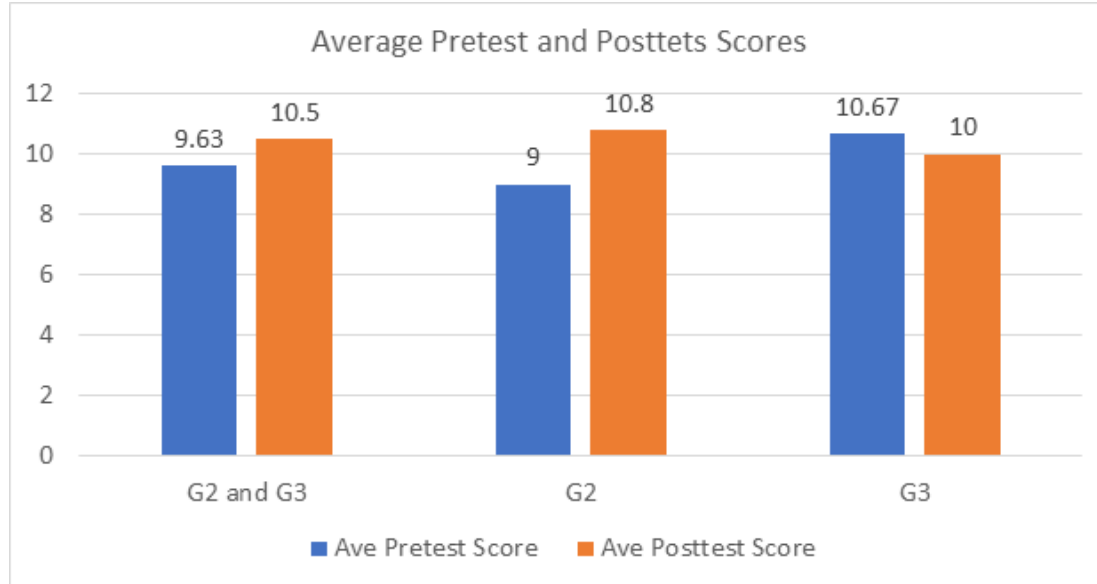
RESULTS

The purpose of this study is to examine the impact of technology on students with significant cognitive disabilities by comparing students' average pretest and posttest scores. Despite a small sample size, the normal distribution of students' growth from pretest to posttest was supported by the Shapiro-Wilk test. As a result, a t test was used to test the main hypothesis, which stated a null hypothesis. There was not a significant difference in the knowledge, which supports the null hypothesis.

Table 1
Comparing Students' Average Pre and Post Mean Scores

Grade Level	Student Count	Average Pretest Score	Average Posttest Score	Difference between Average Pretest and Posttest Scores	Sig. (2-tailed)
2 or 3	8	9.63	10.5	0.875	0.371
2	5	9	10.8	1.8	0.233
3	3	10.67	10	-0.667	

Figure 2



The difference between the pretest and posttest scores was not significantly different.

The second-grade students difference between the pretest and posttest scores was not significantly different. The third-grade students had a lower average posttest score than their average pretest score. These results and their implications are discussed in the subsequent chapter.

CHAPTER V

DISCUSSION

The purpose of this study was to determine if the incorporation of technology would increase comprehension of reading on students with significant cognitive disabilities. The study utilized a quasi-experimental design, which consisted of a pretest, using the n2y curriculum pre/post assessments to determine a baseline for reading skills such as phonemic awareness, sight word knowledge and reading comprehension.

The null hypothesis that there would be no statistically significant difference in the assessment despite using technology in dynamic ways to increase student attention and learning was accepted.

Implications of Results

Student gains in reading vary depending on many factors. Students are exposed to a very repetitive curriculum which explores many topics. The topic was plants which was discuss, experienced through multimodal means, and builds upon itself. The importance of incorporating technology was to help assistant in the acquisition of those skills. In incorporating technology or any teaching strategies the belief is the teacher would eliminate the achievement gap. As Morgan (2013) points out low literacy levels deter children from increased success in academics later in life. Technology has been used to increase engagement and awaken the most apprehensive learners. Students who can read are more likely to be placed in a least restrictive environment. With the ability to read and comprehend comes more inclusion opportunities.

As the students are exposed to new topics and reading material, they continually need support. The use of the pre and post data helps teachers make quality decisions about how to best aide the students in gaining the knowledge. Also, these assessments help take data to look

at student success globally. Students with significant cognitive disabilities are often inconsistent throughout their years of learning. There may be months of great gains and strides followed by months or little to no progress.

Two of the third-grade students have home-life situations which have affected their school performance and availability for learning. The school has work to be collaboratively to help these students in their time of need. One is moving to a new house after being homeless for more than two years. Each transition from shelter or temporary housing has affect his ability to attend in school. He often withdrawals from his surroundings and does not communicate with his peers or adults he has known for three years. The second student is working through transition as his mom goes back to school and therefore is not around in the evening. His schedule has been affected and is often given to many of members of the family who are unaware of the importance of keeping his regimented routine.

Threats to Validity

There are many variables other than the disabilities that many influenced the data collected such as school attendance, family involvement, time of day of administration, medical factors, and disruptions with schedules.

There are three of the eight students who have attendance issues. The first student has a history of absences where counselors and pupil personal workers. The absences this year total over forty-five days. During the month of March, she was absent eight days. Frequently her parents take her out early school due to the fact they think she will get tired. They often say she is sick but do not take her to the doctors. The second student has a syndrome which affects her health. She gets fatigued easily due to history of heart issues. The third student is homeless and has seizures. His attendance is much better, but transportation is still an issue.

Many students despite the sending home books on the topic, sight words, and word work parents do not work on it with them at home. Many parents do not make time during the evening despite the discussion at back to school nights. One set of parents told the teacher they will start working with her on academics next year when she is in the third grade. Many parents find it daunting because the students do not like sit to complete it. The homework sent home does not get completed because they often do not have time. Some of the students are in therapies until nine at night.

Often students have a preference on when they are available for learning. If it was administered right before lunch when they may be hungry which would negatively affect their performance. For some students, they protest when it is a reading assessment given during a nonreading time of day. Students can be affected by the person who administered the assessment to them.

Finally, another factor in validity is medical factors which are influence their performance. A few students have attention disabilities in addition to their cognitive disabilities. Sometimes parents forget to give medications or are not consistent with the medications. One of the students have emotional disorders which the parents refuse to medicate for. The student is often given some medication when one of the parents is not around.

Relationship to Literature

According to Wilson (2013), the incorporation of technology such as e-readers should help even the most struggling readers. Based on the study done it did help it just was not statistically significant. When the students in the classroom where read the book on a tablet they were much more engaged with the book as compared to the print version. The students could interact with the book an allowed to have it read to them and turn the page.

According to Coyne, Pisha, Dalton, Zeph and Smith (2012), when e-books are included in a comprehensive reading program there are higher gains in comprehension. Overall since the beginning of the year with the inclusion of e-books and comprehension assessments with visuals from the story the students have had more success with this task in relation to their IEP goals. As their comprehension has increased so has their ability to express the vocabulary words discussed throughout the unit. When the sight words are paired with a visual and found in the text the students have success within a structured setting.

In the future, including technology during reading instructions for students with significant cognitive disabilities should still be included. This discussed that while it may not be statistically significant it is not detrimental. Many of these students are exposed to technology in their lives and is still relevant to the population. This study looked at one class over a five-week period rather than a longer period.

Implications for Future Research

The topic of the incorporation of technology with students with significant cognitive disabilities lacks research. Findings from this study suggest further research on larger population samplings over a longer period. The time spent in the study could have potentially occurred for an entire school year. The study could have included other forms of technology such as the interactive whiteboard. This added time with more students may have offered more in-depth findings.

Conclusion

The results show that incorporating technology with a structured fully balanced reading program may increase student achievement. While studies need to be done on students with significant cognitive disabilities, it can be very taxing with many variables. Each student is like

a puzzle piece different in a variety of ways. They express their learning and receive information very differently. More studies need to be done on this population to help teachers find out what can make a difference in bettering their academic success.

References

- Beilby, M. (April 26, 2018). How technology ensures that the lecture remains at the core of education. *MEETOO*. Retrieved May 8, 2018, from Google.
- Chai, Z., Vail, C. O., & Ayres, K. M. (2015). Using an iPad application to promote early literacy development in young children with disabilities. *Journal of Special Education*, 48(4), 268-278. Retrieved November 16, 2015, from ERIC database.
- Couse, L. J., & Chen, D. W. (2010). A tablet computer for young children? exploring its viability for early childhood education. *Journal of Research on Technology in Education (International Society for Technology in Education)*, 43(1), p75-98.
- Coyne, P., Pisha, B., Dalton, B., Zeph, L. A., & Smith, N. C. (May 2012). Literacy by design: A universal design for learning approach for students with significant intellectual disabilities. *Remedial & Special Education*, 33(3), p162-172.
- Flewitt, R., Kucirkova, N., & Messer, D. (2014). Touching the virtual, touching the real: iPads and enabling literacy for students experiencing disability. *Australian Journal of Language & Literacy*, 37(2), p107-116.
- Kellems, R. O., Grigal, M., Unger, D. D., Simmons, T. J., Bauder, D., & Williams, C. (2015). Technology and transition in the 21st century. *Teaching Exceptional Children*, 47(6), 336-343.
- Knight, V., Browder, D., Agnello, B., & Lee, A. (Mar 2010). FOCUS on exceptional children. *Focus on Exceptional Children*, 42(7), p1-14.
- Macaruso, P., & Rodman, A. (Mar/April 2011). Efficacy of computer-assisted instruction for the development of early literacy skills in young children. *Reading Psychology*, 32(2), p172-196.

- Morgan, H. (Nov 2013). Multimodal children's E-books help young learners in reading. *Early Childhood Education Journal*, 41(6), p477-483.
- Spooner, F., Ahlgrim-Dezell, L., Kemp-Inman, A., & Wood, L. A. (Mar 2014). Using an iPad2® with systematic instruction to teach shared stories for elementary-aged students with autism. *Research & Practice for Persons with Severe Disabilities*, 39(1), p30-46.
- Staples, A., & Edmister, E. (Jun 2014). The reintegration of technology as a function of curriculum reform: Cases of two teachers. *Research & Practice for Persons with Severe Disabilities*, 39(2), p136-153.
- Wild, M. (2009). Using computer-aided instruction to support the systematic practice of phonological skills in beginning readers. *Journal of Research in Reading*, 32(4), 413-432.
- Retrieved November 16, 2015, from ERIC database.