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Effects of a Software Program vs. Constant Time Delay in the Acquisition of Sight Words for a Student with Significant Disabilities

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Effects of a Software Program vs. Constant Time Delay in the Acquisition of Sight Words for a Student with Significant Disabilities

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ABSTRACT

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The development of sight words is essential for individuals with significant disability. There is a plethora of research highlighting the acquisition of sight words for this population but to date, most focus on teacher led interventions (Browder, Algrim-Delzell, Spooner, Mims, & Baker, 2009). This study investigated the use of computer technology vs. one-on-one instruction targeting sight words acquisition for a student with a significant disability. Results showed the participant indicated improved performance using the computer based intervention versus the constant time delay instructor led intervention.

DEDICATION

I would like to dedicate this thesis to my family and friends. Most importantly, this is dedicated to my father, Ali Algharbie, who encouraged and influenced my pursuit of education. Also, to my mother, Haya Alhomayan, who has supported me been there for me to help through difficult times. I also dedicate this to my wife, Lama Aldhmadi, who also supported and encouraged me and my brother, Mashail Algharbie, who along with support and encouragement, stood by my family in Saudi Arabia while I have been studying in the United States.

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CHAPTER 1

INTRODUCTION

Teaching literacy skills to students entering the school system is one of the first tasks of any teacher. Students who have a moderate to severe intellectual and or autism have a more difficult time learning to identify words and the connected text around those words. This is a challenge for most teachers, and there have been many methods, strategies and approaches to meeting these challenges. Times change, students grow and society evolves everyday so the teaching instruction has to evolve as well. With this in mind, interventionist across the globe are searching for newer, more improved, more updated and more efficient ways to teach students Sight Words to this population. Historically, a response prompting strategy called constant time-delay has been successfully used to aid these students in identifying and recognizing many words in lots of contexts (Soorenian, 2013). In fact, it has now been identified as an evidence based practice to teach sight words (Browder et al., 2009). Sight Word instruction has since remained to be the one of the primary modes for reading instruction (Alberto, Waugh, & Fredrick, 2010). However, due to the recent surge in technology to aid in instruction, interventionists must consider alternatives to teach sight words in addition to the more typical format (Alberto, Waugh, Fredrick, Davis, 2013).

Technology and the software programs aimed at teaching Sight Words to students who have developmental disabilities (DD; to include students with moderate to profound intellectual disability and/or autism) are essential teaching strategies (King, Brown, & Smith, 2012). Given the importance of sight words instruction for students with DD, educators should be informed about the potential for technology based intervention to aid in instruction. (Soorenian, 2013).

The effectiveness of computer devices and software technology helps students in ways that traditional learning methods, such as the use of flash cards and response prompting, have previously in the past (Tanis et al., 2012). Students who have these disabilities and are learning sight words experience problems on a daily basis such as understanding, recognizing orders, more so than other students who do not have a DD. (King et al., 2012).

The effect of software technology in the modern education system can be viewed as philosophical, meaning that with this evolving technology, sets of directions and commands create a program that can be arranged in so many ways that a certain program can work well with any student of any ethnicity, background, history, language and culture while achieving the general purpose to bring a positive future to these students in this continuously growing and changing society. The processes involved in this technology incorporate a variety of simple and complex systems that are created, implemented, modified and customized in order to effectively attain any person's educational goals. (Tanis et al., 2012).

When software technology is effectively integrated into the classroom, students with moderate to severe intellectual disabilities are offered multiple means to complete their work and participate in the academic undertakings that other students, who have no disabilities, take part in. This creates an enriched, positive and productive learning environment that allows these students to feel at ease in the larger group while learning to overcome their specific disabilities.

Software technology can be also defined as an essential entity that is used to promote the learning of targeted skills such as sight words among students with DD (Tanis et al., 2012). It prompts each and every student, with or without a disability, that he or she will have a modernized system of learning that brings them out of the educational dark ages and into the great world of graphics, sounds and enhanced techniques that will usher all students into the

future, especially for those who have DD (Soorenian, 2013).

Computer software, used as a tool in the educating of students with intellectual disabilities, can also be useful in a student's self-determination, motivation and independence (Tanis et al., 2012). Reports also suggest that even though the use of computers and similar devices by students who have intellectual or developmental disabilities has progressed over the last decade, the use of the different types of these technologies still need improvement across the population as a whole (Tanis et al., 2012).

A study conducted by Cullen, Keesey, Alber-Morgan and Wheaton (2013) involved four African American students who had disabilities. The goal of this study was to evaluate the effects of a computer-assisted instruction program on the acquisition of sight words using a Kurzweil 3000 text to speech program device. Included in the activities were: (a) typing target sight words, (b) highlighting words that are spoken on the computer screen, (c) reading sight words, and (d) completing a cloze passage. Results of the study concluded that all four students met their goals by mastering the target sight words within two to seven sessions each approximately 20-25 minutes.

Another study conducted by Lee and Vail (2005) involved four young students with developmental disabilities. This study was conducted to find the effectiveness of using a computer program to teach sight word recognition. Constant time-delay was embedded into the procedure which also included sounds, video, text and animation. A multiple probe design across four word sets was used to evaluate the effectiveness of the program. Results from this study indicated that all four students reached their goal of recognizing the target sight words.

By evaluating the studies conducted that computer technology makes the task of the interventionist much easier to work with students who have significant disabilities. Today, there

are many forms of computer technology and many devices that are being created, updated and revised. Students have the most up-to-date information as possible and can have access to the best resources available to them and this is why it is important to continue research in this area. Such devices as IPad, smart board and similar devices are already on the market to be used and implemented by interventionists, however, through more research, computer programs that can be more easily understood and used by these students is essential as every day, the technology is updated and showing more improved in many areas especially those with significant disabilities. The purpose of this study is to support the literature already available for review and to verify the need for computer technology to be used in the teaching of sight words because it has quickly replaced most traditional methods.

Research Questions

The following research questions will guide this investigation:

1. Is there a difference between the effects of traditional constant time delay verses a computer software program in the acquisition of targeted sight words?
2. What are the effects of constant time delay and the computer software program on ability to maintain acquired sight words for the participating student?
3. What are the parents' perceptions of constant time delay vs. computer software program procedures and outcomes?

CHAPTER 2

LITERTURE REVIEW

Sight Word Instruction

Sight word instruction is a process in which the teacher uses a list of functional words represented as signs and symbols to help students build basic word recognition skills and help them progress in area of reading. Sight words can be student specific and are important to the daily living of students who have moderate to severe intellectual and behavioral disabilities (Fossett & Mirenda, 2006).

A study by Specter (2011) explores evidence on sight word instruction in teaching students with significant cognitive and verbal limits in reading printed words in which nine single-subject studies were rated for identifying evidence-based practice. This study concluded with evidence in support of a massed trials approach involving student response to a list of items, differential positive reinforcement, systematic prompting and visual supports.

A study by Alberto et al. (2010) the most common method of reading instruction for students with DD is sight word instruction. The purpose of this study was to focus on the instruction of multiple-word phrases and the instruction of reading and comprehending individual words and connected text through the use of simultaneous prompting. Results showed that the students showed generalization across connected text found in community environments.

Sight-word instruction is an essential type of reading instruction for students with DD (Alberto et al., 2013). Sight words instruction is a whole-word approach to teaching word

recognition which has long been used as an approach with students with DD (Browder & Xin, 1998). In this instruction, students are taught to identify words as logographs. A logograph is a single written symbol that represent an entire word without focus on its pronunciation (Spector, 2011). This approach is considered a whole-word approach to teach word recognition versus a phonics-based approach which focuses on phonemic awareness and decoding (Browder & Xin, 1998).

Research over the years has been developed, tested, analyzed and documented from using traditional one-on-one (teacher-to-student) methods to implementing and applying better and more successful methods such as those that include the use of modern computer-aided technology. Using sight-words offers the instructor a comprehensive resource that develops a strong foundation while providing the student with intellectual disabilities an attractive and fun way to learn and improve on their language skills (Schiller, 2009).

The Learning First Alliance of Washington, D.C. (LFA) presented an action plan in 1998 that suggested that young children should develop a strong base of cognitive skills that relate to print, background knowledge, and a love for reading books. The article states that, upon reaching the first grade, all students should be able to phonetically sound out short words, be knowledgeable of "many" sight-words and have good reading comprehensive skills. Students with intellectual disabilities have a more difficult time learning these skills and so the LFA made clear in their proposed action plan that all policy-makers and educators adopt practices that are consistent on effective reading instruction including better teacher education, professional development, and parent participation. It also made clear that the school system as a whole should adopt effective research-based methods including improved diagnostic assessments and increased reading research. In addition, government mandates that emphasize student

achievement have made it important to develop and apply appropriate assessment techniques for students with or without intellectual disabilities to determine students' strengths, weaknesses, and strategies in the areas of reading fluency, decoding, sight-word recognition, and reading comprehension by using informal reading inventories (IRIs) which allow a direct link between evaluation and instruction, thus, assuring and maintaining procedural fidelity throughout the education system (Provost, Lambert, & Babkie, 2010).

Technology to Teach Sight Words

Students who have intellectual disability or autism can be just as successful as students who have no disability with the help of technology tools to help them recognize and identify sight words, how to use these words in sentences and to put them into a larger text.

This study was conducted by Coleman, Cherry, Moore and Yujeong (2015) to evaluate the effects of teacher-directed simultaneous prompting to computer-assisted simultaneous prompting for teaching sight words to three students who have intellectual disabilities. Activities for the computer-assisted method included the use of Intellitools Classroom Suite software and traditional materials (flash cards) were used with the teacher-directed method. The two methods were compared using an adapted alternative treatments design. Results showed that all three students acquired the target sight words under both conditions. The students felt more at ease and more comfortable using the teacher-directed method over the computer-assisted method because the students were not yet familiar with using the computer technology, however, the study found that using the computer-assisted method was more efficient.

Another study conducted by Musti-Rao, Lo, and Plati (2015), which consisted of two studies, involved three students for study 1 and three different students for study 2. In the first

study, the three students participated in using an IPad with a teacher-directed method to learn sight words while the three other students of study 2 participated in self-mediated iPad instruction. Concluded in the results showed increases in sight word fluency during the IPad instruction but there was a limited increase in oral reading fluency. In study 2, the three students showed high levels of achievement while using IPad compared to being used in independent reading time.

With another study done by Mechling, Gast, and Thompson (2009) compared the use of a SMART Board, interactive whiteboard technology and flash cards in teaching a small group of students. Under each condition, grocery aisle marker words were selected for three students to read. Results concluded with all three students effectively acquiring their target words using flash cards and SMART Board but, more observational words were read by using the SMART Board technology.

Information Technology (IT) has become an essential part of everyday life in the work place and during leisure times. Learning to use IT has also become a part of a general criterion for most students as a general course. Students who have intellectual disabilities have a little more difficulty in learning the skills involved in using IT.

Studies conducted have shown that roughly 33 % of students with an intellectual disability knew nothing about using a computer and this was not the result of a lack of desire in learning or an inability to learn but, instead, the research shows that this is a result of students with ID not given the opportunity to learn IT. Not only did the results show that students were not given the chance to use this technology, but the educators were not properly or adequately trained in how to teach it to their students. The instructors lacked the proper training techniques as well as sufficient software programs to use in the training process

(Li-Tsang et al., 2005).

Computer technology in the new millennium has made reaching these goals much easier. Increasing improvements and better strategies have emerged with the introduction of this technology and its access to the vast number of resources that are available. Instructive strategies, plans and methods are formatted and easy to understand, much in the way that sight-words are used, to form a viable structure for every educator to use as a guideline to maintain a procedural fidelity that can be used globally in the efforts to improve on research to help teach children with intellectual disabilities to merge into and function within a modern society. Studies have been conducted and have found that students have shown rapid improvement in their ability to learn sight-words with the introduction of computer technology almost immediately. After eight weeks students with moderate to severe intellectual disabilities identified computerized images of sight-words within two seconds of being shown when the authors of the study used a multiple-baseline-across-behaviors design (Yaw et al., 2012).

Results have shown that students with moderate to severe intellectual disabilities have been dependent on direct methods but once introduced to the computerized learning environment, they produce results which are slightly more efficient in terms of trials to criterion (Coyne, Pisha, Dalton, Zeph, & Smith, 2012).

How do students of different ages, different cultures, different languages and different levels of intellectual disability experience using Information and Communication Technology (ICT) in their daily lives? This is one of the tasks of the agencies involved in teaching. Computer literacy is not easy for everyone but with the emergence of software programs that require no more than the push of a button or the click of a mouse over a specific

interest, the process of learning to use computer technology becomes a less difficult one (Palmer Wehmeyer, Davies, & Stock, 2013).

Taking this process and then applying learning programs to a wide variety of software designs then makes the experience of learning sight-words simple, easy and easy to update, upgrade and modify under any circumstance. Students from all corners of the planet can enjoy the use of this technology and learn instructions in the same systematic way that works with any culture, any language and any level of intellectual disability while also ensuring that a solid procedure fidelity is maintained (Palmer et al., 2013).

Another investigative study was conducted by researchers in Hong Kong which focused on the task processes that were causing the difficulties of students with intellectual disabilities and their use of human-computer interface. In this study, 16 identified tasks rendered varied levels of difficulty and the involvement of the participantsrevealed two differentiated tasks which were general motor functions and the use of customized tool bar functions. Most of the tasks involved included visual acuity, vigilance, orientation and basic sensory/motor abilities. Findings from this study revealed the difficult tasks involved with teaching students with ID to use computer-human interface with computer devices. Once, specific lessons and instruction are applied and time allotted for students to learn, the tasks become easier and the students become more comfortable with using computer technology (Wong, Chan, Li-Tsang, & Lam, 2009).

An investigative study was done in 1996 by Derer, Polsgrove and Rieth which determined that even then, students with intellectual disabilities who used Assistive Technology (AT) constituted between 10 % and 23 % of the population of students without ID who used AT.

The use of computer technology and the multimedia experience using software that is commonly available on computers in homes and classrooms reflect from research that the use of this digital format along with sound effects, colorful images and animations gain the attention of a child much quicker and hold the child‘s attention during the instruction process. The child‘s enthusiasm increases with these features and so does his/her willingness to learn (Rivera, 2013).

With that being said, the criterion is clear as to what is needed to make an intervention with families and their children who have intellectual disabilities beneficial and a success. Selecting the most appropriate and beneficial strategy is the most important step to begin a successful intervention. A properly trained instructor will be able to identify the specific disability and at what level the disability is. A good instructor will know the differences in strategies and will know whether a teacher-directed or student directed approach is best or perhaps both. A well-qualified instructor will know if a direct instruction or precision teaching technique is best for an intervention. Also, a professional instructor will know the procedures and methods that are best for each case scenario (Keel, Dangel, & Owens, 1999).

In either situation, any prepared instructor will need ready access to all the tools and knowledge available to be used during an intervention and with the assistance of computer technology, all data can be stored and filed and methods can be programmed and modified to precision Every detail counts during an intervention, even down to the difference of seconds allotted during time-delay exercises which can prove to be almost impossible to do without the help of computer technology.

Once the student becomes comfortable with using this technology, the appropriate software programs can be put into place and specific instructions such as the learning of sight-

words can be applied. The process is not simple and easy as can be seen throughout the years of research and study. However, it is necessary and required in order to give students with intellectual disabilities a fair chance and opportunity at achieving success once they've entered into the modern working society.

Several investigations were conducted and summarized between 1990 and 2005 focusing on the use of assistive technology to assist students with intellectual disabilities on how to begin and complete daily tasks. Of these investigations, four areas of needed research were defined and analyzed: pictorial prompts, tactile prompts, auditory prompts and computer-aided systems. Students with intellectual disabilities are showing more and more of an increase in the need to have their independence, manage their own behaviors and be able to accomplish daily tasks on their own. This self-management procedure is in the form of consequences to target behaviors and uses stimuli such as pictures and/or audio cues that precede the occurrence of a targeted behavior. Computer technology, including the use of accessing information technology and ability to understand and use human-computer interface, is essential in the need to provide students with such stimuli (Mechling, 2007). This is especially true when applied to the teaching of sight-words among a vast variety of students from different areas of the world and different levels of society but, there is still a great divide between those with intellectual disabilities with access to computer technology and those of the general public who have access. It appears that it is not so much a problem of a student's desire or an instructor's goal to use computer technology but more of an underutilization where students with ID do not have the necessary resources and/or the access to it (Tanis et al., 2012).

The future of computer technology in the educating of students with moderate to severe intellectual disabilities is a very promising one as long as progress is being made in the field of studies relating to this particular teaching method. Continued research and steady funding from the government and any other source will enable more and more educators to learn and implement techniques into a working process that maintains procedural fidelity on a global scale. The number of support groups and organizations in local communities that help raise awareness is never too much for it is important to reach out to all statuses and lifestyles that are less able to reach available resources.

Providing funding programs that assist in the implementation of computer technology into school systems to help teach students with intellectual disabilities is a process that is still under constant scrutiny and consideration. Devices such as laptops, desktop pc's, I pads and other gadgets are not cheap and supplying them to an entire school system is quite an undertaking and a huge expense to the nation's budget. The Individuals with Disabilities Education Act (IDEA) authorizes team members whose expertise in processes that lead to quality decision-making can evaluate who qualifies for the individualized education program (IEP) and to carefully consider those schools as well as private agencies and their instructors in using assistive technology for the diversity of students with disabilities (Al-Krenawi, 2011). No child who has an intellectual disability should be denied access to resources that will aid him/her in their learning however, providing these resources is still a monumental task of effort and money so it is critical that studies and research continue to evaluate the effectiveness of the students' learning progression and the support given to them from the schools or agencies they are involved with. (Vlasak & Ranaldo, 2012).

In order to be successful, in this field of study, to prove beneficial to the student

selected to be the target of a particular study and to gain knowledge that will aid in the task of enabling young students living with moderate to severe intellectual disabilities to learn sight-words through the assistance of computer technology, the determined instructor will know the importance of gaining the trust of those families whose children are involved. One of the very first things to know in depth and detail is how students with these disabilities learn in an academic setting. Different cultures, different regions, different school districts all using different tactics in teaching children who all suffer from them. A guideline is designed and planned then put into a working procedure that can be used across the spectrum of not just the students but, also, the instructors as well.

Significant efforts to advance the rights if millions of people with cognitive disabilities, particularly those people with intellectual and developmental disabilities are being tasked by professionals and consumers representing a variety of disciplines and perspectives and are endorsed by numerous national, state and local organizations in the developmental disabilities field in the United States (David et al., 2013).

Response Prompting Strategies

A response prompting strategy is a procedure grounded in applied behavior analysis, specifically in stimulus control theory where a teacher uses prompts, such as modeling or physical assistance, to stimulate a student's response to a particular question (Seward, 2008). Studies have been shown that response prompting in teaching has been effective with a wide range of skills to students with a wide range of abilities, particularly in literature (Wolery & Schuster, 1997).

A study conducted by Appelman, Vail, and Leiberman-Betz (2014) focused on the acquisition of instructive feedback information that was presented to four kindergarten children with mild delays using a multiple probe design across word sets. Results of this study resulted in all four students acquiring high percentages of their targeted English and Spanish sight words. Observational learning yielded lower percentages of English and Spanish words that were not targeted.

This study by Seward, Schuster, Ault, Collins and Hall (2014) focused on comparing the effects of simultaneous prompting and constant time delay to teach card games to five high school students with moderate intellectual disabilities. Results from this study showed that simultaneous prompting was more efficient and resulted in fewer training errors and constant time delay required fewer sessions and resulted in fewer probe errors.

When teaching functional sight-words to students with moderate to severe intellectual disabilities, constant time delay (CTD) is best used alongside simultaneous prompting (SP). Simultaneous prompting is simply a random and non-calculated instruction that is offered to the student without notice.

Using both allows the student to work on his/her timing both with and without a set time limit. This method is more effective and beneficial as in society, nothing is always fixed at a set rate. Once again, traditionally teaching this would be a great challenge for even the best of instructors but with the assistance of computer technology, the challenge is much less and can quickly be implemented, modified and applied (Näslund & Gardelli, 2013)

Quality of Life for Students with Special Needs

The world of healthcare has changed drastically over the last decade. A result of these changes and increases, people with intellectual and developmental disabilities are outliving

their parents with siblings being the longest lasting relationships. Therefore, many of these siblings end up becoming the caregivers and guardians of each other when the parents pass away. Siblings' experiences with the service system's efficacy, including barriers, services' needs and impacts are being a major focus in meeting this population's needs (Emily & Carmen, 2014).

A concept of quality of life for people who have intellectual disabilities is recognized globally in which students, instructors and the families involved seek to achieve, even though principles regarding conceptualization, measurement, and application vary from region to region. There will always be a constant focus on developing systems and procedures in mounting these monumental challenges. Along with creating a planned system of providing the necessary equipment, supplies and devices as well as providing the proper instruction, the challenges foreseen are achievable and with the constant improvements and developments of computer technology, including the efforts to maintain a reasonable affordability, these challenges become more easy to Conquer (Schalock et al., 2002).

In the field of teaching instruction to students with intellectual and developmental disabilities, a new generation of leaders must take the reins and meet the challenges that it faces during these times of policy, systematic and organizational transitions (Brady, Fong, Waninger, & Eidelman, 2009).

Intellectual and developmental organizations are working to apply transformation strategies that will provide a framework of transformational thinking, learning and acting. These strategies, combined with associated characteristics of the transformation (naming, defining, diagnosing, classifying, and planning supports) are essential tasks in this transformation era (Schalock, & Verdugo, 2013).

The transformation of organizational structure includes the conversion of facility-based services to individualized supports in the community. Those facility-based services use different approaches but use a systematic guideline shared with all the service organization for being involved. These shared themes are the commitments to common values and mission, the turn or return to authentic person-centered planning, shifting power and control, and using community supports and relationships which nature staff engagement (Walker, 2012).

The beliefs, languages, and practices of caregivers and care-giving organizations are termed as caregiver culture. These cultures are subject to case studies which highlight the processes of organizational change, and the growth of caregiver expertise (Purvis, Cross, Jones, & Buff, 2012).

The World Health Assembly, which governs the World Health Organization (WHO), issued a World Report on Disability in 2011 that detailed a comprehensive scientific analysis on the global situation of people with disabilities. This report has raised awareness as well as helped developing policies, funding, technology support and research. As a result, nine recommendations have surfaced to better inform on these policies and to help reform practices. First, to help enable access to mainstream policies, systems and services that have been created and modified concerning the educating of students with intellectual disabilities; second, to help in the investing of specific programs and services that focus on these students; third, to adopt a national disability strategy and plan of action to be implemented by available providers; fourth, to involve the students who have these intellectual disabilities as to provide participation experience; fifth, to improve human resource capacity to match the demands for provider services; sixth, to provide adequate funding and to improve affordability to those families who need

financial support; seventh, to increase public awareness and understanding of intellectual disabilities and their effects on the person and the family; eighth, to improve upon the collecting and storing of data gathered, analyzed and documented; and ninth, to strengthen and report research on intellectual disabilities (Officer & Shakespeare, 2013).

The current thinking involved in all this is focused on five functions. The first function is the power of naming and attaching an identification to the group of students who have intellectual disabilities. The second function is to define and identify those who have an intellectual disability as opposed to others who have a different type of disability such as a physical disability. The third function is the diagnosis of this particular group of people. The fourth function is classifying this group into the overall structure of society. Finally, the fifth function involves planning available supports and services for each person in this specific group of students who have been found to have intellectual disabilities (Officer & Shakespeare, 2013).

In adhering to the current guidelines set by the government relating to the Sight-Word Component of the larger Integrated Literacy Curriculum, there are three sets of controlled vocabulary and two sets of functional vocabulary that fill in the missing areas of a child's development of communication (Alberto et al., 2013).

These sets become modified and tailored to each child according the family's lifestyle and customs as well as the particular language that the family uses. Traditional one-on-one sight-word instruction in its early stages, proved to be successful as it was tested to many studies.

The children involved in these studies showed great improvement in their ability to identify and understand a certain word and what the word meant by using a picture or image such as used on flash cards. Continuous research and aggressive legislation over

the years has embraced the technology era into the arsenal of tools and supplies used in the further improvement of instruction which makes the task of the service provider much easier and more efficient (Coleman, Hurley, & Cihak, 2012).

Advancing the technologies in many areas of human development including mobility, vision and hearing, communication and activity in daily lifestyle habits can greatly enhance a child's ability to communicate thoughts into words with determination and a certain level of independence. This particular research shows a big technological divide between those technologies used with students who have developmental disabilities and those who have intellectual disabilities (Robert & Ruth, 2013).

In the world today, among the seven billion people that live and share societies on this planet, a growing population of people are intellectually challenged. From birth, their journey is a long and difficult one and it has been that way since the dawning of mankind and civilization. In efforts to help integrate these people into society and all the aspects of society including school, teachers and instructors have realized that Sight Word instruction has proven to be the best method for teaching these people how to identify and communicate with other people who are not disabled.

The use of pictures and the relationship to words associated have aided in the educating of intellectually disabled students and have provided a path to a better life than previously known. The government has, in the last 25 years, pushed for and approved funding of programs that encourage and educate the vast population of these students.

Constant research and studies from hundreds of literature reviews have been documented and filed for access to a great amount of data that supports the need for continued research and further funding. The invention of the computer and the introduction of its technology into the

mainstream world has taken the matters of identifying and providing the proper instruction to many of these students to another level with the implementation of related software and special programs designed for teaching such methods as Sight Word instruction. These programs are also easy and fast to modify so various types of these instructions can be tailored to specific students in relation to where the student lives and attends school, ethnicity and cultural environment as well as social and financial status.

In my research of the hundreds of literature reviews, I find that there is, in fact, a growing effort to push legislation to provider more much needed services to the teams of educators in the field, the school systems throughout the communities and cities as well as the families of intellectual disabled children. However, more work needs to be done. The computer world is constantly changing and evolving, unique and specific programs are being written in the designs of new software that is easily available and even somewhat modified even further customizing a specific child subject to a nearly perfect profile. New and more affordable computerized devices are being invented, upgraded and made available to be used as tools in the educators' inventory.

As mentioned before, it is essential that as many children who are moderately to severely intellectually disabled are located and offered the opportunity to help provide the proper and appropriate resources that will enable their child or children to become more of an active and productive part of their local community. It is important to study many different kinds of methods that can be used in the aid of educating these children while in school and even in their own home. Computer technology can make this so much more possible to achieve. Legislation is always subject to change depending on the current

state of the union and available funding.

CHAPTER 3

METHODS

Participants

The participant in this study included one student with severe intellectual disability and autism who was 12 years old. This targeted student met the following inclusion criteria as having a) severe intellectual disability b) adequate hearing and vision c) consistent motor responses that are able to access a computer independently and d) regular attendance.

Setting

The settings were in the child's home and a place called “Talk Back Therapy”, where a child goes to improve their motor and communication skills. The participant, the participant’s mother and the interventionist met for three sessions at this place. The participant’s mother was watching all the intervention sessions. The schedule of the intervention was one hour a day three days a week in the late afternoon when both parents were home with the child.

Experimenter

The interventionist for this study was the lead author whom is a graduate student in special education and has training in teaching and research. Additionally, the interventionist has been in the field for three years and holds a bachelor degree in special education, but is currently in the final semester of his Master’s Degree in special education. The interventionist collected data during all phases of the study. Additionally, after being trained in the study procedures, the mother of the participating student collected interrater and procedural fidelity measures. She currently serves as a middle school special education teacher and holds a Master's Degree in Special Education.

Materials

The interventionist introduced a basic laptop computer to serve as a platform for the software component of the intervention. The program, Survival Signs & Symbols, from Attainment Company, a program focused on teaching Sight Words from the community. The program, which has 94 generally used community sight words. The 29 sight words were not randomly chosen, rather, they were identified by the participant's mother as words the participant needed to learn. After she identified the targeted words, he was pre-assessed to determine if he had prior knowledge of the words. The result of the pretest yielded 12 words that were determined to be the final words to be used for the study. These 12 words were randomly divided and assigned to the software learning and constant time delay one to one conditions. The constant time delay words were constructed on 4x6 index cards.

Data Collection Procedures

Dependent Variable

The dependent variable is the number of sight words acquired during instruction with the software program and number of sight words acquired during instruction with teacher/student instruction. The interventionist recorded a (X) for each correct or a negative blank for each prompted correct answer or incorrect response.

Independent Variables

Condition 1. The first independent variable is a Sight Word program called *Survival Signs & Symbols* by Attainment Company. This program opens up on the computer and introduces itself to the participant and gets him familiar with how to use the program. After the

participant got comfortable in how to use it, the program opened up a list of six sight words for the participant to learn and to respond by connecting signs to the corresponding sight word.

Condition 2. The teacher to student format consisted of the interventionist delivering instruction using constant time delay with two rounds of zero delay followed by a five second delay round. First, the interventionist showed six sight word flash cards to the participant by showing the picture first then on the back of the cards the interventionist explained what the picture meant. The interventionist repeated this for the six flash cards and when finished, he showed one of the target pictures with three other cards the participant did not learn. Then the interventionist asked the participant to point to the correct symbol. When the participant responded correctly, the interventionist gave him verbal reinforcement "Good job". When he responded incorrectly or when he waited longer than five seconds, the interventionist pointed to the correct symbol and verbally said "This is the correct answer".

Research Design

The researcher used a Single Case Alternating Treatments Design to compare the difference in participants' scores on sight word probes during either software supported instruction or teacher implemented instruction. The study included two phases: baseline and a comparison phase.

Procedures

Baseline Phase

The initial baseline phase included the use of flashcards to test the student knowledge of targeted sight words and each correct or incorrect response was recorded. Additionally, baseline

probes were also used to test the targeted words in the software program. No praise, prompts, or error correction procedures were used during this phase. The student was only praised for appropriate attending behaviors.

Intervention Phase

The initial intervention phase consisted of alternating two interventions. Rapid and repeated manipulation of the two targeted interventions occurred across each session. Each intervention was implemented randomly with no more than two consecutive observations of the same condition occurring. The researcher used a die to determine the order of the intervention. An even number on the die corresponded with condition one and odd number with condition two. Each instructional session the researcher took the target student to the targeted instructional area in the living room area and set up the materials before beginning instruction.

Maintenance

Maintenance was performed using the same procedures as described above approximately five days after intervention was finished.

Interrater Reliability (IRR)

The participant's mother collected interrater reliability (IRR) during both baseline and intervention phases for approximately 30% of the sessions taught. IRR was calculated by taking the number of agreements divided by agreements plus disagreements and multiplied by 100. IRR for both baseline and intervention were 83.33% (ranged from 80% to 100%).

Procedural Fidelity (PF)

The participant's mother also checked for procedural fidelity (PF) approximately 30% of baseline and both intervention conditions. PF was calculated by checking if each instructional

component was performed by the interventionist through the use of a checklist. The number of steps implemented correctly was divided by the number of procedural steps planned and multiplied by 100. The results of PF for both conditions were 100%.

Social Validity

A social validity measure was created for the student and questions targeted both the procedures of the intervention as well as the outcomes. Additionally, a measure was also created for the interventionist to receive feedback on the intervention and outcomes from the parent's perspective. The first question was "Both interventions are appropriate and important for the participant." The second question was "The five-second wait time used in one-on-one method is appropriate for the participant." The third question, "There was increase in correct answers by participant in both interventions." The fourth question, "I am considering using the computer method of teaching sight words to other students." The fifth, "The verbal reinforcements given by the interventionist was appropriate." The sixth, "The tools used in this intervention such as flash cards and computer program were effective." The seventh, "The participant's mother fully understood the interventionist's procedure." The eighth and final question was "I am considering using this procedure for the participant in continued sessions."

CHAPTER 4

RESULTS

Figure 1 shows data regarding two conditions in teaching Sight Words to the participant. The first condition, a traditional one-on-one instruction using constant time delay was compared to a second condition, a computer-assisted method. Results indicated both conditions indicated effectiveness in acquisition of the targeted words. As the graph shows (see Figure 1), both methods produced successful answers, however, the computer-assisted method produced a quicker response than the one-on-one method.

During baseline, the participant's scores indicated a mostly stable trend with a mean of 11.11 (range= 0 to 33.33). During intervention the participant showed overall change for computer program and the mean was 88.88 (range 50 to 100). During intervention for one-on-one method the participant showed overall change. The mean was 81.48 (range 50 to 100) (see Figure 1).

Maintenance

Five days after both interventions, maintenance was collected, for computer program method, the participant answered four out of six sight words. For one-on-one method, the participant answered three of six sight words, indicating that by using the computer method, the participant answered with more correct responses than with one-on-one method (see Figure 1).

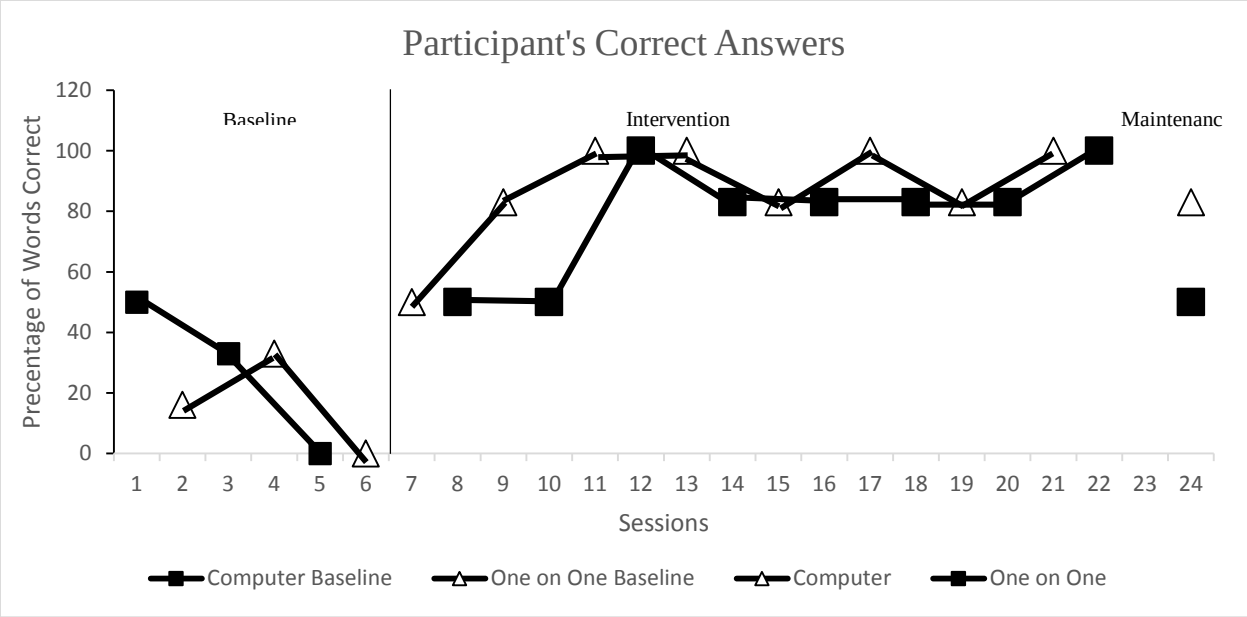

Fig1 Percentage of correct responses for the child baseline and intervention over a period of nine sessions

The participant's mother responded to the eight questions of social validity. The participant's mother responded with seven (agree) responses and one (neutral). She agreed with all the questions but one, in which she was neutral. The question she was neutral on was "I am considering using the computer method of teaching sight words to other students." The mean of the social validity questionnaire is 87.5.

CHAPTER 5

DISCUSSION

Students who have intellectual disability or autism can be just as successful as students who have no disability with the help of instructional tools to help them recognize and identify Sight Words, how to use these words in sentences and to put them into a larger text such as a thesis or a simple report. In this study, a comparison was made between two methods of Sight Word instruction. One-on-one method and computer-assisted method was used on a student with intellectual disability to measure the effectiveness of each method and the differences. Results concluded that the student was successful in reaching the target goal with both methods, however, with the implementation of computer-assisted technology into the teaching procedure, the student reached the target goal by producing correct answers much quicker than by using the one-on-one method. This shows that the student's response time was shorter and the student seemed to be more motivated and more enthused.

Limitations

There were some limitations in this study that the interventionist faced while conducting this study. The first limitation was that the first three sessions of intervention were performed in an environment outside the home where the next six sessions were performed in the home. The change in setting from baseline to intervention could be a confound. A second limitation was that during the first session of baseline, the student used a touch pad to control the computer but, the interventionist realized that the student might have better control through the use of a mouse to control the computer. A mouse was provided to the participant on the second session of intervention. Also, one limitation was in the scheduling of intervention sessions with the

participant and his mother. Given the busy schedule of the family, finding a consistent time for to implement the study was difficult, therefore, the scheduled session times varied and were irregular. A fourth limitation may have occurred due to the participant's ability to understand the interventionist's accent. For example, the participant may have had difficulty understanding the interventionist's accented words, such as when the interventionist showed the child a flashcard and asked for a response. The interventionist's heavy accent at times seemed to cause confusion to the participant and the mother had to reiterate the words to him to promote understanding. Also, in this study, the social validity questionnaire and questions were simplified for the fact that only one participant was used.

Future Research

It is obvious that as more and more computer technology is being created, updated and modified for use with this population of students (Näslund & Gardelli, 2013). Continued research on the efficacy of such technology needs to be conducted as well as its efficacy compared to evidence based practices in regard to acquisition in order to find the best possible methods to use when teaching students who have DD. As related to computer technology, such computer devices such as IPads, laptops, IPhone and other devices can be used to find which tools the student works the best with. Different programs covering many different languages can be helpful to students that live in other countries and the technology that a can be used in a multi-cultural way is also important to research. Different methodologies work differently with different students depending on status, family environment and cultural background and so understanding more about the lifestyle of a student and his/her family is also important to research as this makes the learning process for the student a more comfortable process. Research in all these areas are in demand and are always being updated and modified so it is important in

the future for any interventionist to keep research up to date with all aspects of the teaching process. Adding a generalization measure would be more effective in the same study and more participants in the study would be more effective in finding better results.

In summary, this study investigated the effects of a sight word instructional software program versus constant time delay on the acquisition of targeted sight words for a participant with DD. Results indicated that the use of computer technology implemented into the learning session showed a slight increase in the success of the learning procedure. Although the participant showed more dependence on the one-on-one traditional method with the instructor, the computer technology used produced more success at a slight rate.

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APPENICES: A

One-On-One Procedures

Date: Observer: Note:

Instruction Steps

Student Sign In	1.__ find correct set of words for one to one instruction 2.__ gains student attention and trust	
Sight Words	Sight Word Identification 1.__Selects flash card that will be taught 2.__Asks student to identify selected sight words at a zero delay round. Say, "point on the symbol?" followed immediately by the "target symbol" 3.__ Continue on through all 6 words Sight Word Identification- 5 sec Delay 4.__shuffle words and tell student this time they need to identify the word on their own. Tell the student not to guess, but wait if they don't know and you will help them. 5.__Ask student to identify target word. Say, "point on the symbol?" 6.__ wait 5 seconds 7.__, if no response, instructor tells student correct answer and asks student to repeat word. Praise for repeating word. 8.__if student responds with correct answer, instructor provides specific praise and moves on to next word. Continue on for remaining words.	
Record results	9.__ record data throughout delay round for each word	

APPENDIX: B

Technology Procedures

Date: Observer: **Notes:**

Instruction Steps

Student Sign In	1.__signs student in with name, time and date for session 2.__ gains student attention and trust 3.__opens computer sight words program 3.__introduces computer program to student 4.__ allows student to learn how to use computer program for session 5.__opens selected list of sight words on program	
Sight Words	<u>Sight Word Identification</u> 6.__computer program selects sight word from list that will be taught 7.__asks student to identify selected sight word 8.__ allow student to respond by identifying selected sight word on computer program 9.__after 5 seconds, instructor will prompt computer program to go to next selected sight word 10.__, if no response, instructor tells student correct answer 11.__ if student responds with correct answer, instructor prompts the participant to selects another sight word with computer program	
Record results	12.__when finished, records results	

APPENDIX: C

Social Validity Questionnaire

Participant: _____ The participant's parent: _____ Date: _____

This questionnaire consists of eight questions. With each statement, you need to indicate the extent to which you agree or disagree with each statement. Please indicate your response to each statement by circling one of the three responses to the right.

Question	Responses		
1. Both interventions are appropriate and important for the participant.	Agree	Neutral	Disagree
2. The five second wait time used in one-on-one method is appropriate for the participant.	Agree	Neutral	Disagree
3. There was increase in correct answers by participant in both interventions.	Agree	Neutral	Disagree
4. I am considering using the computer method of teaching sight words to other students.	Agree	Neutral	Disagree
5. The verbal reinforcements given by interventionist was appropriate.	Agree	Neutral	Disagree
6. The tools used in this intervention such as flash cards and computer program were effective.	Agree	Neutral	Disagree
7. The participant's mother fully understood the intervention procedure.	Agree	Neutral	Disagree
8. I am considering using this procedure with The participant for continued sessions.	Agree	Neutral	Disagree

APPENDIX: D

Data Collection Forms

One-One Instruction Form

Chosen Symbols	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8
First Aid								
No Parking								
No Food or Drink								
No Cell Phone								
Push Bottom for Walking								
Gas								

Computer Instruction Form

Chosen Symbols	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8
Walk								
Taxi								
In case of fire, use stairs								
Don't Walk								
No Bicycles								
Danger								

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