Rowan University

Rowan Digital Works

Theses and Dissertations

1-24-2014

The effects of using Smartboard and interactive games to improve reading comprehension of secondary students with moderate cognitive disabilities

Melissa Coyle

Follow this and additional works at: https://rdw.rowan.edu/etd

🔴 Part of the Special Education and Teaching Commons

Let us know how access to this document benefits you - share your thoughts on our feedback form.

THE EFFECTS OF USING SMARTBOARD AND INTERACTIVE GAMES TO IMPROVE READING COMPREHENSION OF SECONDARY STUDENTS WITH MODERATE COGNITIVE DISABILITIES

by
Melissa Coyle

A Thesis

Submitted to the
Department of Language, Literacy & Special Education
College of Education
In partial fulfillment of the requirement
For the degree of Master of Arts in Special Education
at
Rowan University
May, 2013

Thesis Chair: Joy Xin, Ed. D.

Dedication

I would like to dedicate this manuscript to my parents, James and Mildred Coyle

for all their support and encouragement.

Acknowledgements

I would like to express my appreciation and thanks to Professor Joy Xin for her help and guidance throughout this research.

Abstract

Melissa Coyle
THE EFFECTS OF USING SMARTBOARD AND INTERACTIVE GAMES TO
IMPROVE READING COMPREHENSION OF SECONDARY STUDENTS WITH
MODERATE COGNITIVE DISABILITIES
2012/13
Joy Xin, Ed. D.
Masters of Arts in Special Education

This study investigated the effects of using the Smartboard and interactive games to improve reading comprehension skills of secondary students with moderate cognitive disabilities. A total of 11 9th and 10th graders in a special services school participated in the study. A single subject design of ABC phases was used. During the baseline (Phase A), student listening comprehension was evaluated by their scores of correct responses to "Wh" questions on their paper. During intervention (Phase B), the teacher used the Smartboard and *Boardmaker* software to present fiction and nonfiction stories. Each session included the student listening to the story, read by the voice embedded in the Smartboard, and visual images with a game format. During the maintenance (Phase C), students were evaluated using the same procedures as that of the intervention. At the end of the study, students' opinions about using the Smartboard and interactive games were surveyed. The results showed that 9 out of 11 students increased scores, 1 out of 11 students maintained their score, except one. After completing the study, students responded to a survey on using the Smartboard and interactive games. The results showed that all students enjoyed using the Smartboard and the games in their learning.

Table of Content

List of Figures

List of Tables

Chapter 1

Introduction

As I watch my students walk into the classroom each day with smiles on their faces I feel a sense of pride to be their teacher. However, when the lesson starts, I find very few of them are able to answer questions related to their reading. This experience is not new to me. I remembered that I was lost in class when my teacher asked questions. I knew that I understood but I was not able to respond to the questions in my reading.

All of the students in my classroom are classified with multiple disabilities. Reading is extremely difficult for these students due to their weaknesses in the area of language development associated with reading, such as phonological awareness, morphology, syntax, semantics and pragmatics (Kuder, 2013). In addition, students with moderate intellectual disabilities have difficulties with attention. They have shorter attention spans, very easy to lose their attention, inability to generalize and maintain skill (Coleman, Hurley & Cihak, 2012). Thus, they often lack understanding, focus and engagement during reading instruction. The same situation has been found in my classroom. For example, during my instruction I review the material and modify the lessons to meet each student's needs. After listening to a story and reviewing the comprehension questions the students still are unable to answer the questions. Instead of answering questions they would simply stare at me or repeat my questions. It is important to provide reading instruction with appropriate strategies to these students in order for them to gain understanding in reading comprehension.

According to Lyons, Thompson, Coleman, Hurley and Cihak (2012), Direction Instruction, guided reading and computer assisted instruction are effective in teaching reading comprehension. Direct Instruction is a highly structured, teacher centered instructional method. It includes fast paced, well sequenced, highly focused lessons taught in small groups. Instruction is presented through scripted lesson plans in small groups of students with the same skill level. The instruction allows for frequent assessment of student progress, as well as immediate correcting of mistakes and teaching to mastery (Council for Exceptional Children, 2012). Studies have shown with consistent implementation by well trained teachers, growth rate in reading increases to two or three times the normal rate (Grossen 2004). Further, Direction Instruction has been found to be effective to students at the low reading achievement level (Coyne, Zipoli, Chard, Faggella-Luby, Ruby, Santoro & Baker 2009), as well as those with autism spectrum disorders and developmental disabilities (Flores & Ganz 2009).

Guided reading is a teaching approach to assist struggling readers, it has three fundamental purposes; a) to meet various instructional needs of diverse learners b) to read increasingly challenging texts with fluency and understanding; and c) to help construct meaning while using problem solving strategies to understand complex sentence structure as well as new ideas and concepts (Simpson, Spencer, Button & Rendon, 2007). Guided reading has been shown to be effective on students with middle school and elementary students below grade level (Lyons & Thompson 2012), and those with autism spectrum disorders to learn life skills (Simpson, Spencer, Button & Rendon 2007).

Computer-assisted instruction refers to using the computer and software programs in instruction. It has been found to increase motivation, attention, and time on task by presenting instruction interactively through the use of sound, animation, and video recordings. Computer-assisted instruction can be used for instruction on pre-reading and reading skills for students with disabilities (Mechling, Gast & Krupa, 2007). Software programs used in computer-assisted instruction can be web-based or installed in the computer, such as Powerpoint. It has been found that computer-assisted instruction with Powerpoint has shown positive results in teaching functional sight words to students with cognitive disabilities (Coleman, Hurley & Cihak, 2012). However, the use of computer-assisted instruction to promote comprehension in high school students with learning disabilities showed limited improvement.

Current technology used in school is an interactive whiteboard, which is referred to as the Smartboard. A Smartboard consists of a large touch sensitive screen that uses a sensor for detecting user input that is the equivalent to normal PC devices such as a mouse and keyboard. A projector can be connected to display computer video outputs onto the screen (Xin & Sutman, 2011). It has been found that the use of the Smartboard to be a promising intervention in prompting student engagement and sustaining attention for students with disabilities (Whitby, Leininger & Grillo, 2012). It is also been found that the use of the Smartboard as part of an intervention to increase participation and motivation for students with disabilities in inclusive classrooms. The use of Smartboard technology has also been found as effective computer-assisted instruction in teaching students with moderate intellectual disabilities to learn sight words (Mechling, Gast, & Krupa, 2007).

However, little was shown in these studies on using the Smartboard to improve reading comprehension skills of students with disabilities.

Current research has shown an increased use of technology to improve literacy skills of students with disabilities (Carnahan, Williamson, Hollingshead & Israel, 2012). Specifically, as content becomes more advanced, students may have more difficulties understanding abstract information. Many students have strong visual processing skills and are able to process instructional directions and content when presented in visual format or with visual support (Whitby, Leininger, & Grillo, 2012). Though the research shows the use of various forms of technology, specifically the use of interactive whiteboards can help improve literacy skills, there is very little research, to date, on the use of interactive games presented on the Smartboard to improve reading comprehension. There also is little research on technology-based instruction for high school students with moderate cognitive disabilities. In addition, research on reading comprehension was often focused on elementary and middle school students with learning disabilities, but very few were found for high school students with cognitive disabilities. An attempt of this study is to examine the effectiveness of interactive games presented on the Smartboard to high school students with cognitive disabilities in order to improve their reading comprehension skills.

Statement of Purpose

The purposes of this study are: (a) examine the use of the interactive reading games presented on the Smartboard to improve the listening comprehension skills of high school students with moderate intellectual disabilities, and (b) to evaluate the use of the Smartboard to increase students skills in identifying key details and events in texts.

Research Questions

Research questions for this study include the following: Will the use of the Smartboard improve listening comprehension skills of high school students with moderate cognitive disabilities. Specifically, this study will explore the following questions.

- How will listening comprehension skills of these students improve in regards to answering "Wh" questions in both fiction and nonfiction text when reading activities are presented through interactive games on the Smartboard?

- Will the participating students like listening to stories presented on the Smartboard instead of having it read orally by the teacher?

Chapter 2

Literature Review

Reading skills have been linked to a range of important outcomes of a student's including success in Kindergarten-to-postsecondary education and ability to compete in the labor market (Wei, Blackorby, & Schiller, 2011). Reading comprehension is a skill to understand the meaning of texts. When readers successfully comprehend what they read, the levels of meaning constructed are interrelated to form a coherent, integrated representation of meaning in memory that readers collect in other circumstances to help themselves understand and learn from new experiences and from reading other texts (Reutzel & Cooter, 2007).

Students with disabilities have difficulties in reading comprehension because they lack the reading skills in language development, understanding of text, focus and engagement during reading instruction. These problems become serious for high school students with disabilities who have had an experience of failure in their previous schooling. Teaching students how to understand the texts they are reading is a challenge to teachers, especially those who are working with students with disabilities. Direct Instruction, guided reading and computer-assisted instruction are different instructional strategies teachers use to teach reading and reading comprehension to students with disabilities. This chapter reviews studies using these strategies to teach reading comprehension for students with developmental and cognitive disabilities.

Direct Instruction

Direct Instruction (DI) is a teacher directed, highly structured teaching strategy that breaks down skills into specific components in a controlled and scripted sequence (Council for Exceptional Children, 2012). The major components of an DI include small group instruction, unison responses, signals to encourage student participation, rapid pacing and testing to reach the mastery level.

In Flores and Ganz's study (2007), DI was implemented to teach statement inference, use of facts and analogies. Four middle school and upper elementary students with autism spectrum disorder (ASD), or cognitive impairments (CI), or attention deficit hyperactivity disorder (ADHD) participated in the study. The baseline data was collected for each student in each of the three areas, i.e. statement inferences, use of facts, and analogies prior to the DI. During the intervention, students were instructed daily in the strand of statement inference using *Corrective Reading Thinking Basics: Comprehension level A*. Once students reached 100% on three consecutive probes, instruction on statement inferences was reduced to 1-2 times per week, then instruction on using facts began. This process was repeated for each of the three strands. Results showed that DI was effective to students with ASD. It was found that these students had immediate and remarkable changes in performance from the baseline to the intervention, and they were able to maintain their skills one month after the intervention.

Although the findings of Flores and Ganz's research indicated that DI was an effective strategy for students with DD and ASD, it did not compare DI with other methods or strategies. Also, the intervention was provided by the researchers, but not the classroom teacher.

This could limit the use of DI in the classroom if classroom teachers are unable to practically conduct the intervention and continue to support students in those practices after research was completed.

Although this study demonstrated the effectiveness of DI in teaching specific areas involved in reading comprehension, it was primarily focused on students with ASD and DD in upper elementary grades. Thus, high school students with similar disabilities should be considered. Further research is needed to include high school students with ASD and DD for reading comprehension.

Flores and Ganz furthered their research in their 2009's study focusing on the effects of DI on reading comprehension of students with ASD and DD. The study included three girls and one boy, two were diagnosed with ASD, one with ADHD and one with cognitive impairments. The same procedures were followed, but focused on three different areas: deductions (evaluating whether an event was true or false), picture analogies (analogy through the use of pictures), inductions (generating rules about a particular phenomenon), and opposites (listening to a statement and restating the statement using the opposite of one word within the original statement).The results showed immediate and remarkable changes in student performance from baseline to intervention as well as maintaining improvement through the maintenance period. This is evidence to further support DI to be an effective strategy for improving reading comprehension of students with ASD and DD. Although the study provided evidence to support the effectiveness of DI with students with ASD and DD, it was still focused on upper elementary students. Thus, research on reading comprehension to include high school students with similar disabilities is needed.

The study by Coyne, Zipoli, Chard, Faggella-Luby, Ruby, Santoro and Baker (2009) focused on two DI programs, the Story Read Aloud (SRA) program for elementary students and the Embedded Story Structure (ESS) for high school students. A total of 210, 1st graders at risk participated in the Story Read Aloud program and 79, 9th grade low achievers (14 classified with learning disabilities) is the ESS.

SRA was used in a 16 week's intervention, focusing on living things and storybooks including the specific animals learned about in the information texts as main characters. In each two weeks' unit, teachers read one information text and one storybook, spending four days on each book. Instructional procedures during the intervention included dialogic interactions among students, and teacher aimed at extending discussions using decontextualized language and visual representations to facilitate innertextual connections. ESS intervention covered a total of 17 hours. This intervention focused on three DI reading strategies including student self-questioning of story grammar elements, story structure analysis, and summarization. The students were provided a graphic organizer before, during, and after their reading to reinforce their learning with the strategies.

The results showed that both programs were effective. Specifically, the SRA program improved student retelling of narrative and expository texts as well as understanding of the differences between the types of texts, and vocabulary knowledge. The ESS program was found to be effective in promoting reading comprehension and story structure knowledge of the 9th grade students.

This research provided further evidence of the effectiveness of DI to improve reading comprehension of students at risk and those with learning disabilities. Some of the participants were high school students, but none had developmental disabilities. It seems that the need for further research with high school students with more significant disabilities should be explored.

Guided Reading

Guided reading is a structured approach in which teachers use developmentally appropriate books with children to help them achieve a high degree of reading fluency (Reutzel & Cooter, 2007). Some elements including in guided reading instruction are the use of leveled text, small group instruction, teaching and prompting of effective reading strategies, and independent activities (Lyons & Thompson, 2012).

In Massengill's study (2004), guided reading was implemented to determine its impact on overall reading levels of adult readers and on word-recognition behaviors (specifically decoding, structural analysis, and sight word reading). Four adults, two men and two women, between the ages of 25-52 with reading levels between 1st -6th grade participated in the study for a period of 36 sessions over three months.

Prior to the intervention, participants took the tests of Slosson Oral Reading Test (SORT-R) and Analytical Reading Inventory (ARI) to determine approximate reading levels and strategy used. At the same time, word attack subtest of the Woodcock Reading Mastery, and the Dolch word list were provided to assess participant's sight word vocabulary as pre-assessments. The baseline data was completed in 3-4 lessons, when the participants were reading a text passage and lists of words for the daily assessment.

The intervention focused on decoding letter-sound correspondences, using structural analysis, and learning sight words. In decoding instruction, the main activities that took place during the word work section were segmenting and blending words (e.g. using sound cards or Elkonin boxes, interactive sentence writing), word sorts, word building (e.g. using chunks and word families), and making words. For structural analysis, participants were required to eliminate prefixes and suffixes to find the root word, as well as learning how to count back from the end of the word to identify the location of stress and how the vowel was pronounced. For sight word instruction, new words were introduced in each session. Each new word as written on a flash card for students to sound out, spell out (i.e., using letter tiles or tracing in rice) and use the word in their own sentence or find the word in the text. After each session, a daily assessment was given to record student's performance. After the final session, participants were given the same assessments as post tests. Finally, one maintenance session was conducted two weeks after the intervention and another was followed in another two weeks. During these sessions, a running record was used to evaluate their performance, as well as two follow up assessments on target areas.

Results showed guided reading intervention produced an increase in the learner's knowledge and ability to recognize words. All four participants made positive changes during the intervention as well as an increase in their overall reading level. These findings help validate that Guided Reading has a positive impact on adult learner's literacy skills.

Although the study demonstrated positive outcomes in using Guided Reading to increase overall reading skills involved with reading comprehension but it was focused

on low literate adults who were not classified with a disability. Thus, more research is needed using guided reading with high school students with disabilities. Also, the research did not focus on reading comprehension skills as a target area. Therefore, further research is needed in the use of guided reading instruction to improve reading comprehension. Further research is also needed in a long term to use guided reading to improve learner's literacy skills.

In Simpson, Spencer, Button and Rendon's study (2007), Guided Reading was provided to increase reading skills of students with ASD. Eleven elementary students, nine boys and two girls participated in the year long study. All the participating students had dual diagnosis including disorders such as speech impairments, cognitive impairment (CI), and emotion disturbances.

The baseline data was established through testing using the following assessments: Diagnostic Reading Assessment, the Texas Primary Reading Inventory, and independent reading inventories along with running records, graded passages, and word lists. During the intervention for a full school year, students were directed to work stations for 20 minutes each day, then rotated to the other stations. These stations focused on basic reading skills, written language and math. (The basic reading station included 2 stations, one on comprehension and the other on phonics using the Spalding phonics program.) Students also received 10 minutes of individual time with the teacher.

During this time, the teacher completed a running record, instructed mini-lessons with students requiring constant redirection, tested sight words, and documented student's progress.

This study provided evidence for the use of guided reading as an effective strategy for increasing reading skills of students with ASD. Results showed that student's reading levels increased between 6-24 months. Their improvement was found in the areas of fluency, reading comprehension, phonics, and listening comprehension.

This study provided evidence to support the use of Guided Reading with students with ASD, however, it only compared the students with their own previous abilities, not nationally standardized samples. Furthermore, the research was conducted in a classroom where a teacher, three paraeducators and parent volunteers present, this amount of staff seems unrealistic in general education classrooms. Also, the research focused on elementary students, and further study is needed for high school students with ASD and other development disabilities.

In Lyons and Thompson's study (2012), Guided Reading was implemented in middle school inclusion classrooms to determine its effectiveness. Thirty-one students in the 4th, 5th, 6th & 7th grade inclusion classrooms participated in the study, of which some were classified with learning disabilities, ADHD, autism, hearing impairments, fetal alcohol syndrome, and others with social and behavioral problems.

To provide effective instruction, teachers attended three workshops on implementing guided reading prior to the school year. To establish the baseline data, each student took the *Fountas & Pinnell Benchmark Assessment*. During the intervention of 3-4 months, the students were divided into small groups for guided reading instruction. During this guided reading session, groups worked on average 20-25 minutes with the classroom teacher or a special education teacher.

The instructional materials included leveled texts referring to reading materials that are sequenced from simpler to complex tasks according to a specific set of criteria (Lyons & Thompson, 2012) as well as teaching and prompting effective reading strategies. While the groups worked with the teacher, the other students work independently on various tasks including journal writing, related word study activities, projects, learning centers and independent silent reading. At the end of the intervention, students were given the *Fountas & Pinnell Benchmark Assessment* again to evaluate their performance.

Results showed that 80% of students advanced on reading levels during the 3-4 month's intervention, and 15 of 19 students who were assessed below grade level during the baseline showed an increase in reading levels over the intervention period. Students also increased their confidence, engagement, and motivation as indicated by the teacher. Theses results further support the use of guided reading as an effective reading strategy. Although the study produced further evidence on the effectiveness of guided reading, the small number of participants limited the findings as well as generalization of the results.

The study included upper elementary and middle school grades students as participants. High school students with similar disabilities should be considered. Although evidence demonstrated students' increased reading level, reading comprehension was not indicated. Thus, the need for further research of Guided Reading on reading comprehension should be explored.

Computer-Assisted Instruction

Computer-assisted instruction (CAI) has embedded technology to present information to learners. In a traditional CAI program materials are often presented in a linear format, to involve text or still pictures, while, the contemporary educational programs involves various sounds, videos, and animation to allow a range of interaction between the learner and the computer (Lee & Vail, 2005).

 In Williams, Wright, Callaghan and Coughlan's study (2002), CAI was implemented along with traditional reading instruction to determine if children with autism learn to read more readily by CAI or a traditional book method. Eight children, ages 3 to 5, diagnosed with ASD participated in the study.

The study lasted 15 minutes with each child per day, 5 days a week for 20 weeks, of which10 weeks were spent for the book instruction, and another 10 weeks for the CAI. During the study, direct observations on children and their behaviors were monitored and recorded for two separate ½ hour periods on different days (using specially programmed Psion handheld computers) during the phases of the baseline, crossover, and final assessment. A list of words reported by the parents were used for learning vocabulary. During the intervention, direct observations with a computer program was used every two weeks through each 10 week's period. The time attending to task was recorded for each child every second week, the goal was to keep children's attention for 15 minutes. During book instruction, students worked one to one with a specialized teacher and some games with flashcards were provided in daily instruction, along with books with physical artifacts to make them more interesting. During the CAI, books were scanned into the computer along with sounds.

Students were able to turn the pages using the mouse and listen to the story, as well as hear the same sounds when clicking on the screen image in the book. Games using drag and drop technology was also provided during daily instruction. After the intervention, the North Yorkshire Assessment was given to students' to evaluate their performance.

The results showed that all students spent more time on task when they were working at a computer. Also, children spoke more than twice the number of words during the computer instruction than the traditional book instruction. In addition, spontaneous appropriate gestures were used to communicate their needs about 41 times in the computer condition and only once in the book reading. It is also found that the children were able to concentrate longer using the computer, and were more compliant while students regularly refused to cooperate during the book condition. These results provide evidence to support the effectiveness of CAI for teaching reading to students with disabilities. The research also provided evidence to support the use of CAI to engage and motivate students with ASD.

Although the research provided further evidence, it did have limitations. Due to the small sample size it was not possible to make meaningful comparisons between the students in the book condition and those in the computer condition. There was a concern about the research method for example, participating students were exposed to a range of education interventions during the research because of their presence in the classroom. Furthermore, all students participating in the study were preschool or lower elementary graders, and further research is needed with high school students with similar disabilities.

The research provided evidence that one on one instruction with CAI is effective for students with ASD, however, no evidence was provided on the use of CAI for whole class instruction. Thus, further research is needed to determine if CAI is effective for reading instruction in an entire classroom.

In Lee and Vail's study (2005), CAI was used to teach sight words and their definitions to students with developmental disabilities. Four boys ages 6 - 7 participated in the study. Three of the students were classified with mild cognitive impairments, and one student was classified with significant developmental delays.

Baseline data of target behaviors were collected for three days. After a baseline was established, an intervention for the first target set of words was introduced. Once the student received 100% for three consecutive sessions, the next set of words is introduced. When the second set of words was introduced the intervention using the computer program was provided for only the new word set. This was continued for the third group of target words. During the intervention, students used the program of *Word Wizard* which incorporates constant time delay (CTD). Five types of responses were recorded. These included correct responses without prompts within 5 seconds, incorrect responses before a prompt when a student clicked on an incorrect word or did not click on any word within 5 seconds, (When this occurred a prompt screen appeared and students were given another chance to respond.), correct response after a prompt was provided, incorrect responses after a prompt was provided and no response in 5 seconds after a prompt was provided. All sessions involving these procedures occurred daily.

Results provided evidence that CAI was effective for teaching sight words to each of the participating students. Multimedia program embedded with CTD procedures was effective with younger students. The problem was that computer programs did not require an active attentional response from students, resulting in times when students lost focus and stared blankly at the screen.

Though the study provided evidence that CAI was effective, it did have limitations. The computer program had limitations in keeping students' attention and motivation after the initial novelty wore off. Students' significant behavior problems impacted the results of the research, as well as the small sample size that made the results unable to be generalized. Also, all participating students were lower elementary graders, further research is needed with high school students with similar disabilities for a whole class instruction, in addition to the one to one instruction provided in the study.

A recent study by Coleman, Hurley, and Cihak (2012) focused on comparing teacher directed and CAI with constant time delay for teaching functional sight words to students with moderate intellectual disabilities. Three male students participated in the study. Student 1 was 10 years old diagnosed with moderate intellectual disability with a secondary disability of language impairment. Student 2 was 12, diagnosed with multiple disabilities including: ASD, seizures, speech/language impairment, and intellectual disability. Student 3 was 10, diagnosed with intellectual disability with a secondary disability of speech impairment.

To determine the baseline data, students were assessed on recognition of 40 functional words using flashcards. If a word was unknown it was placed in a pile, students were then assessed two more times on unknown words to make sure they were unknown to the student. Eleven of the unknown words were then chosen for each condition, during three sessions. Students participated in two different conditions: teacher directed and CAI. During the teacher directed instruction, the teacher presented flashcards with the word and a picture representing the word, using 11 flashcards in each session. Teachers followed a script along with the following procedures, i.e. during the first session a 0 second time delay was implemented before continuing the instruction. After every 2 words, the teacher provided the following prompt: "Remember if you do not know what the answer is, wait and I will tell you." Verbal recognition was only given at the end of the session.

During the CAI, students participated in a teacher developed *Powerpoint* presentation. Procedures were similar to the teacher directed condition except an audio of the teacher's voice was used in the *Powerpoint*. Also, multiple presentations were created to provide randomness. Once the criterion of 90% accuracy was reached for three consecutive sessions in one condition, preferred CTD occurred. In this study, this meant that the word list from the nonpreferred condition was combined with the list from the preferred condition until students reached 90% accuracy for three consecutive sessions. After reaching the criterion using the preferred CTD, the picture prompt was faded on all flashcards and *Powerpoint* slides. During the generalization phase, a task analysis was created to keep a record of the number of words used correctly.

Results indicated both conditions were effective in teaching sight words for all the participants. During the teacher direct condition, words read correctly increased to 78.11% and the criterion was reached in an average of 19 sessions. During CAI condition, words read correctly increased to 77% and criterion was reached in an average of 24 sessions. The results demonstrated a positive outcome in student performance but comparably students in the teacher direct instruction achieved the criterion in less sessions than in CAI.

Although Coleman, Hurley, and Cihak's findings provided evidence of CAI's effectiveness, it lacked the opportunity to generalize the results due to the small sample size without female participants. Further research is needed with a larger sample size, including females and students of variety of ability levels to generalize the results. Further research should also be focused on words that can be used in a larger variety of activities to increase the use of CAI. Furthermore, the study focused on one on one instruction or individual instruction using CAI, further research is needed on whole class instruction. The focus on upper elementary students with moderate intellectual disabilities limited the findings, further study is needed with high school students with similar disabilities on the use of CAI for reading comprehension.

The use of a Smartboard, a white electronic board, together with CAI is another combination used in reading instruction. In Mechling, Gast, and Krupa's study (2007), CAI was implemented using Smartboard technology to teach sigh word reading. Three high school students, ages 19 to 20 participated in the study. They were classified with Downs Syndrome, moderate intellectual disabilities, and athetoid cerebral palsy.

These students were taught individually for 15 minutes, then 30 minutes for small group practice each day, 3-4 days a week.

Prior to the intervention researchers selected words using *Grocery Signs and Words* and *Lowe's Foods to Go Shopping Online* and developed *Powerpoint* slides presented on the Smartboard for CAI. The target word was placed at the top middle and an arrow button on the bottom, right side of the slide. By clicking on the arrow the slide changes to present a photograph of the target word and three other photographs of target and observational words. Target words were covered on each of the photographs using the "rectangle" tool. A transparent action button was placed over the correct picture which could advance to the next slide containing the next target grocery word when clicked. Data was collected on each of the student responses to assess their ability to read target and non-target printed words and to match photographs to those words.

Results showed CAI with the Smartboard and a 3s CTD procedure to be effective for students with moderate intellectual disabilities to match grocery item photos to target grocery word and to read these words. All students reached the criteria for each of their target word sets and were able to generalize matching the objects to their printed words and printed words to the objects. Although, the study evaluated the effectiveness of Smartboard technology and CAI for recognizing target words and objects, reading comprehension was not included, and further research is needed in this area. The study focused on the use of *PowerPoint* to present the information to students, an attempt of using games to teach students reading comprehension may be a new avenue.

Summary

Reviewing the research articles on DI, Guided Reading and CAI, it was found that each of the mentioned reading strategies are effective but there is little evidence to show their efforts for high school students with moderate cognitive disabilities. There is little research on the use of the Smartboard as an effective way to present CAI due to the latest technology applied in the field. A Smartboard has created a new way for classroom teachers to develop their lessons with sounds, images, and video segments. It is also available for teachers to post an interactive game to allow students touch, move, or write on the screen for their responses. This interactive mode provides an opportunity for students to practice their skills and to reinforce their learning. However, studies on the Smartboard application in the classrooms are very much limited, especially for high school students with moderate disabilities. This current study will focus on this area by using games presented on a Smartboard to teach reading comprehension skills to students with moderate cognitive impairments.

Chapter 3

Methodology

Setting

   School. The study was conducted at a public separate school, in a special services school district in Southern New Jersey. Built in 2001, this school houses both high school and middle school students classified with multiple disabilities (MD). Students are placed in either self- contained classrooms or departmentalized teams according to their level of functioning. Students in departmentalized teams transition to subject area classes taught by a teacher certified in Special Education. All students are placed in different groups according to their individual needs and these decisions are made by the student's Child Study Team of their home district.

   The study was conducted in a special education classroom for 9th and 10th graders with MD. There were 11 students in the classroom, all classified as being multiply disabled, moderate cognitively impaired, or autistic. There were four adults in the classroom to support students including one special education teacher, one teaching assistant and two one on one aides.

Participants

   Student. A total of 11 students participated in this study. Of those, nine were in 9th grade and two were in 10th grade. All participants had IEP objectives in the area of reading comprehension, and needed to receive reading and writing instruction for at least two hours per week in this special education classroom.

Student A was 15, 9th grade male, classified with multiple disabilities. He had weak fine motor skills that made writing difficult for him. He was able to comprehend when the material was presented on his reading level.

Student B was 15, 9th grade male, diagnosed as Autistic. He displayed weak language skills and a short attention span. Also, he had difficulty in response to both abstract and concrete reading comprehension questions.

Student C was 16, 10th grade female, classified with moderate cognitive disabilities. She had difficulty reading and writing independently but demonstrated strong comprehension skills when the material was presented to her orally.

Student D was 17, 10th grade female, classified with moderate cognitive impairment. She was also diagnosed with Down syndrome and had significant problems with fine motor skills that make it difficult for her to write independently. She also had difficulty focusing on information was presented orally. Also she had a one on one aid to help her complete tasks and stay focused.

Student E was 14, 9th grade male, classified with multiple disabilities. He received occupational therapy due to his weak fine motor skills. This student displayed difficulties with reading and writing and became easily frustrated when he could not answer questions or complete tasks. A one on one assistant was providing services to help him complete tasks and stay on track during lessons.

Student F was 14, 9th grade male, classified with multiple disabilities. He also had language difficulties in expressing his thoughts and needs. He was eager to please but could become easily frustrated when he was unable to answer questions or needed extra assistance during instruction.

Student G was a 16, 9th grade male, diagnosed with Autism. He also had language- processing difficulties and received speech and language therapy. This student had difficulties focusing and answering both concrete and abstract comprehension questions. Also, he was struggling in making complete sentences or phrases to answer questions.

Student H was 14, 9th grade male classified as multiply disabled. He also had a diagnosis of Down syndrome and received occupational therapy to improve his fine motor skill. This student was shy and did not like to participate in class but was able to answer some comprehension questions when presented orally.

Student I was 15, 9th grade male, classified as Autistic. He had difficulty staying on task and required redirection during instruction. He was able to answer comprehension questions when presented on his reading level or higher levels presented orally.

Student J was 15, 9th grade male, classified as Autistic. He had difficulties communicating his needs and did not like to participate in class activities. He was able to answer some comprehension questions when presented on his reading level as well as when presented orally.

Student K was 15, 9th grade male, classified with cognitive impairments. He is unable to write independently or transfer material from the whiteboard to his notebook. He requires assistance to trace material, as well as preferred seating due to his visual impairments. He is easily distracted and needs redirection throughout instruction. He has difficulty with comprehension when materials are read orally. He is also unable to read independently. Table 1 presents the general information of participating students.

Table 1 *Student Profiles*

Name	Age	Gender	Grade	Classification	Disability	Reading Level According to Brigance Transition Skills 2012
Student A	15	M	9th	Multiple Disability	Cognitive Impairment	1.0
Student B	15	M	9th	Autism	Autism with speech delays	2.5
Student C	16	F	10th	Moderate Cognitive Impairment	William's Syndrome	1.0
Student D	17	F	10th	Moderate Cognitive Impairment	Down Syndrome with fine motor skills & language delays	Pre-K
Student E	14	M	9th	Multiple Disability	Fragile X	K
Student F	15	M	9th	Multiple Disability	Communication Impairment & Specific Learning Disability	2.0
Student G	16	M	9th	Autism	Autism with Speech & Language delays	2.5
Student H	14	M	9th	Moderate Cognitive Impairment	Down Syndrome	1.0
Student I	15	M	9th	Multiple Disability	Autism	2.0
Student J	15	M	9th	Autism	Autism	2.0
Student K	15	M	9th	Cognitive Impairment	Spastic Diplegic Cerebral Palsy & Visual Impairments	Pre-K

Research Design

A single subject design with A B C phases was used in the study. During Phase A, baseline, participating students were given six reading comprehension worksheets, of those, three for fiction stories and three for nonfiction. Their scores of each worksheet were recorded as the baseline data. During Phase B, intervention, students were presented similar stories on the Smartboard using an interactive game including animation and sounds. The intervention took place over the course of 4 weeks. Ten comprehension stories, five fiction and five nonfiction, were used during this phase to evaluate student performance. Phase C, maintenance, one week after intervention, students were presented with four stories, two fiction and two nonfiction, on the Smartboard to evaluate students retained skills.

Materials

     Reading Materials. Reading stories were selected from the following materials: *The Five W's* reading level Grade 2 by Remedia Publications, *Nonfiction Reading Comprehension* Grade 2 by Teacher Created Resources, *Success with Reading Comprehension* Grade 2 by Scholastic, and *Practice Makes Perfect Reading Comprehension* Grade 2 by Teacher Created Resources. These stories were selected based on the students reading levels, needs, and interests.

     Computer Programs and Games. "Boardmaker Plus" and the software program "Symbolstixs" were used to add pictures into the interactive reading games. "Boardmaker Plus" (Mayer-Johnson.com) creates valuable printed materials, like communication boards, sequences and schedules, as well as to make the class activities interactive with computer sounds, animations and videos. This software was used to develop the reading games for students. *Symbolstixs* (Cricksoft.com) is a program and includes images with vibrant stick figures and other objects as visual representations. This program includes approximately 11,000 symbols. Table 2 presents an example of *Boardmaker*.

Table 2 *Sample of Boardmaker slides presented on the Smartboard*

Summer Vacation

Last summer, Dad, Mom, Tim, and Tara went to the beach in Florida. They swam, fished, built sandcastles, and went sailing. Mom brought a picnic lunch. She spread a blanket on the sand and set out ham sandwiches, potato chips, apples, and cookies. She brought lemonade in the cooler. Later, Tim and Tara walked along the beach and saw a crab walking sideways. A stray dog was barking at it. A starfish washed up on the the beach, too. Tim threw bread crumbs up in the air to feed a flock of seagulls. Then the family went back to the hotel, and Tim and Tara played video games until bedtime.

Next

5. When did the family go on vacation?

Last winter

Last summer

Last spring

right

Measurement Materials

    Worksheets. The format of worksheets used to collect baseline data included the story written at the top followed by five comprehension questions related to the 5 W's, i.e. Who, What, When, Where, and Why. During the intervention, student responses were evaluated using the stories from the same materials, but presented on the Smartboard including sounds and animations.

Procedures

    Measurement Procedures. To collect baseline data, each story was read aloud to the students as well as each of the comprehension questions. Students selected an answer from 3 choices. The number of each student's initial correct answers was recorded for each story. To collect data during intervention and maintenance students' initial responses, from a choice of three, were recorded by the teacher on a data sheet for each story.

Instructional Procedures. After baseline data had been established, the teacher utilized the *Smartboard* to instruct the students and present the material. Prior to the beginning, the teacher reviewed the meaning of each type of W question. The teacher then modeled how to use the Smartboard game. After modeling, the students practiced by going up to the Smartboard to play the game. During the intervention, 10 stories were provided in turns for students so that each child read a different story during each instructional session. Each session included the student listening to the story, which was read by the voice embedded in the *Smartboard,* and visuals aides including pictures of answers to help their comprehension. After the story was read, students played the game to answer comprehension questions by listening to the question and touching the selected answer on the *Smartboard*. If the student chose the correct answer, a positive auditory reinforcer was played; the student was then directed to the next question. If an incorrect answer was provided, a negative sound would be played, and the student would have another chance to answer. This process continued until all five questions were completed. At the end, a positive animation would appear to reinforce the student. Each story followed the same process.

Social Validity

To evaluate the social validity the students will complete a questionnaire. The questionnaire will consist of five yes and no questions. This will allow the students to evaluate the intervention and how they felt about it. Table 3 presents the questions.

Table 3 *Social Validity Questions*

Questions		
1. Did you like working with the Smartboard?	Yes	No
2. Did you think the Smartboard helped your better understand the story?	Yes	No
3. Did you like the sound the Smartboard made when you got a question right?	Yes	No
4. Did you like the sound the Smartboard made when you the answer incorrect?	Yes	No
5. Did you like hearing the Smartboard reading the story?	Yes	No

Data Analysis

A graph will provide a visual representation of the students' performance during the A B and C phases. The graph will show each student's correct answers for each of the stories as well as monitor their progress through the intervention. In addition, students' responses to the questions were calculated and converted into percentages.

Chapter 4

Results

Student performance was evaluated by weekly quiz for 20 weeks. Table 4 represents mean scores and stand deviation across phases A B C.

Table 4 *Means and Standard Deviations of student scores*

Student	Baseline M SD	Intervention M SD	Maintenance M SD
A	4.2 (1.3)	4.3 (1.0)	4.5 (1.0)
B	1.5 (1.0)	2.4 (1.1)	1.5 (0.6)
C	3.0 (0.9)	2.9 (0.9)	3.5 (1.3)
D	1.0 (0.6)	2.4 (1.2)	2.0 (0.0)
E	1.8 (0.8)	2.8 (1.0)	3.3 (1.5)
F	1.3 (1.2)	2.8 (0.8)	3.0 (1.4)
G	1.0 (0.6)	2.3 (1.3)	3.3 (1.5)
H	2.0 (0.6)	2.3 (0.9)	2.5 (1.0)
I	3.0 (1.4)	2.7 (1.4)	2.8 (0.5)
J	2.7 (0.8)	3.3 (1.5)	3.8 (0.5)
K	1.5 (1.5)	2.2 (1.0)	2.3 (1.0)
Class	2.1 (1.0)	2.8 (0.6)	3.0 (0.9)

In general, the data shows that 9 of the 11 students increased their scores in the intervention compared to the baseline when Smartboard and interactive games were used except 2.

Although most of the students made minimal gains throughout the course of the study, variable scores were demonstrated. Student A was keeping similar scores of 4.2, 4.3, and 4.5 during phases. Student B's score was 1.5 in the baseline and increased to 2.4 in the intervention and maintained at 1.5. Student C's score was 3.0 in the baseline and decreased to 2.9 during the intervention and increased to 3.5 in maintenance. Student D's score was 1.0 in the baseline, and increased to 2.4 in the intervention and maintained at 2.0. Student E's score was 1.8 during the baseline and increased to 2.8 and 3.3 during intervention and maintenance.

Student F's score was 1.3 during the baseline and increased to 2.8 and 3.0 during intervention and maintenance. Student G's score was 1.0 in the baseline and increased to 2.3 during intervention and maintained at 3.3. Student H was keeping similar scores of 2.0, 2.3 and 2.5 during phases. Student I's score was 3.0 in the baseline and decreased to 2.7 during the intervention and increased to 2.8 during the maintenance. Student J scores of 2.7, 3.3 and 3.8 increased during the phases. Student K's score was 1.5 in the baseline and increased to 2.2 and 2.3 during the intervention and maintenance. The overall class average for the baseline was 2.1 and increased to 2.8 and 3.0 during the intervention and maintenance. Individual student's performance is represented in Figure 1.
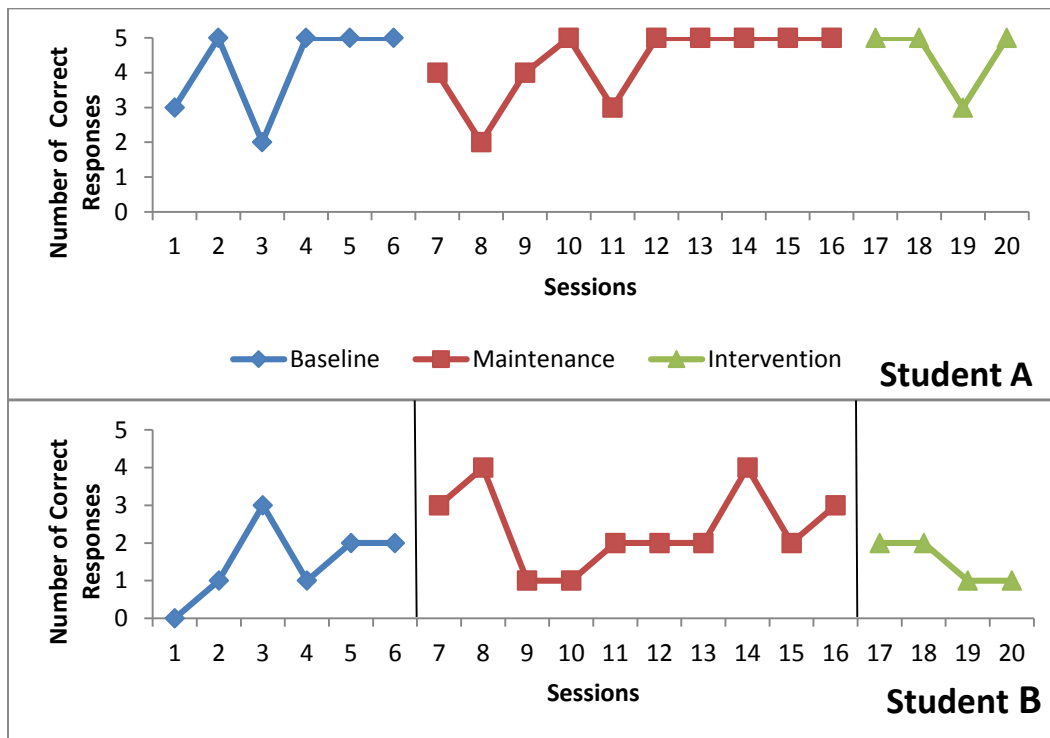

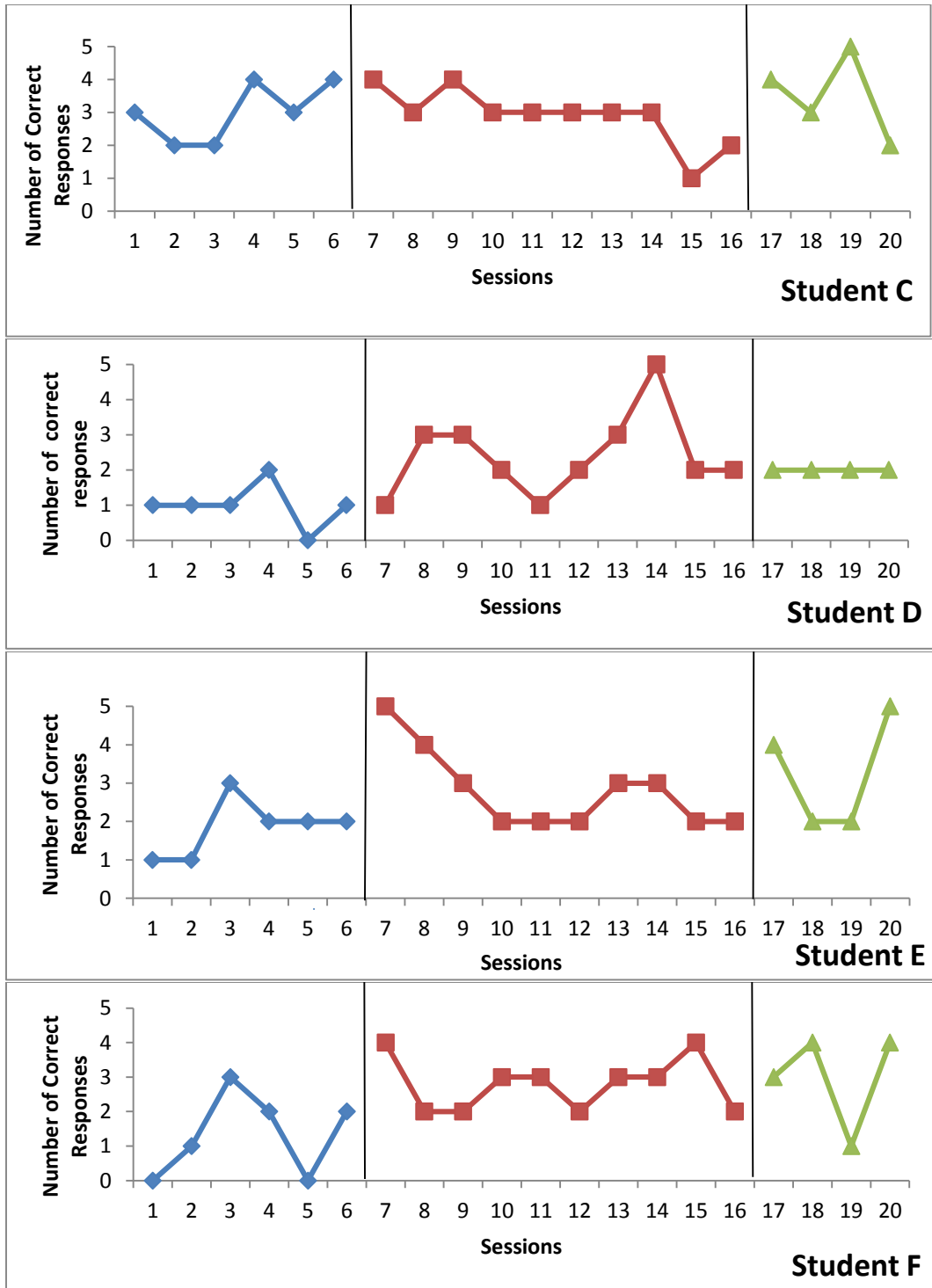Figure 1. Individual student's performance in reading comprehension

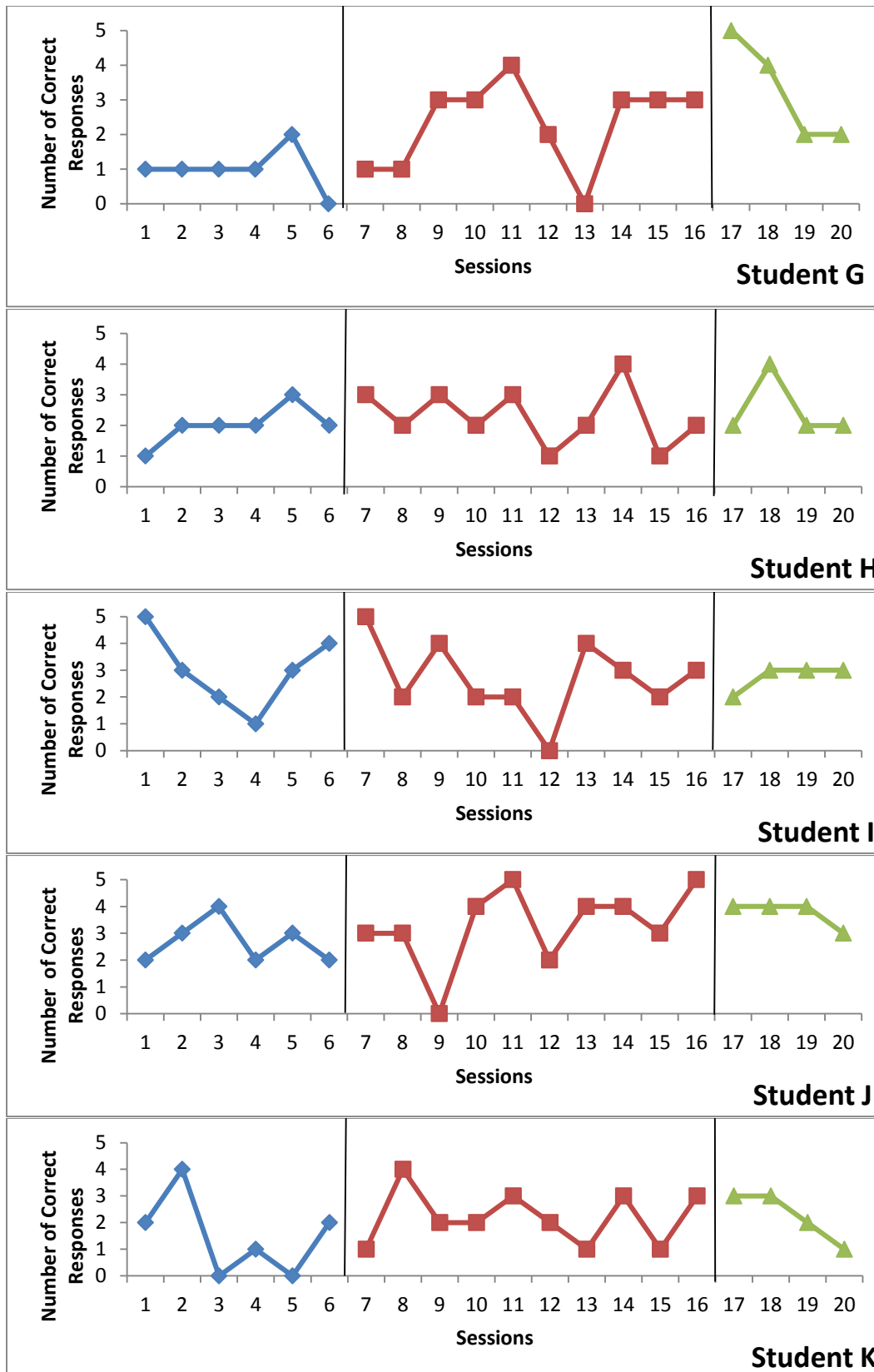*Figure 1*. Individual student's performance in reading comprehension, continued.

Figure 1. Individual student's performance in reading comprehension, continued.

Student Survey

Table 5 *Percentages of student responses*

Question	Yes	No
1. Did you like working with the Smartboard?	91	9
2. Did the Smartboard better help you understand the material?	91	9
3. Did you like the sound when you got the answer correct?	100	0
4. Did you like the sound when you got the answer incorrect?	45	55
5. Did you like hearing the Smartboard read the story?	100	0

At the end of the study, all students were an oral survey to 5 questions. Due to the students' cognitive abilities only yes and no questions were asked. The questions focused on whether the students enjoyed working with the Smartboard, if they felt it helped them better understand the stories, if they liked the correct and incorrect sounds the game made when they answered each question, and if they enjoyed having the story read to them. Table 5 presents their responses by percentages. Overall, the student responses showed that most of the students (91%) enjoyed working with the Smartboard and believed it help them understand the stories better. All the students (100%) found hearing the positive sounds pleasant during the activity. Only five students enjoyed the negative sound, the other six students did not. Lastly, all the students (100%) said they enjoyed having the story read to them by the Smartboard.

Chapter 5

Discussion

Discussion of Results

The current study examined the effect of the use of the Smartboard and interactive games on reading comprehension of secondary students with moderate cognitive disabilities. Results showed that 9 of the 11 students (82%) made improvement throughout the course of the study. For example, Students D, E, F, & G gained their scores by one or more points. This may be concluded that the use of interactive games on the Smartboard has positive effects on these students' reading comprehension.

The first research question addressed if listening comprehension skills of these students improve in regards to answering "Wh" questions in both fiction and nonfiction text when reading activities are presented through interactive games on the Smartboard? The results showed that 82% (9 of 11) of the students increased their scores in answering "Wh" questions during the intervention. However, 2 of the students had limited improvements. This could be due to the students' engagement with the Smartboard. For example, Student I consistently received higher scores during the baseline than during the intervention and maintenance phases.

The second research question addressed if the participating students liked to listen to stories presented on the Smartboard instead of having it read orally by the teacher? The study showed that 100% of the students liked listening to the stories being read by the Smartboard. Each of the 11 students responded in the student survey they enjoyed hearing the stories read by the Smartboard. Perhaps it is because, the voice embedded in the Smartboard spoke in the same tone for each story.

In the study, all students were able to go to the Smartboard to touch, move and respond to questions independently after they were instructed. For example, Students D and E require one to one aides to complete academic assignments as a routine, but were engaged during Smartboard sessions and without individual supports. They even repeatedly entered the classroom asking to play the game and presented their willingness to go first. Results of the student survey showed 91% (9 or 11) of the students enjoyed working with the Smartboard. For example, students were consistently compliant during intervention and maintenance sessions to follow the teacher's directions. This is important to note due to the fact that at times students B, D, E and H had behavior problems in the class but when called up to the board they were compliant and in some cases excited and happy. Also, during the study, the students who engage in self stimulatory behaviors were able to stand still and listen to the story presented by the Smartboard. The findings support the previous research on the use of computer-assisted instruction for with students with moderate cognitive disabilities by Mechling, Gast, and Krupa (2007) with positive outcomes, and extended to using the Smartboard with interactive games. Meanwhile, this current research on the use of interactive games and the Smartboard for students with moderate cognitive disabilities to demonstrate these students' improvement of their scores during the intervention and maintained their scores during the follow up maintenance.

Limitations

Although the current study showed some student's improvement in reading comprehension, it had limitations. One specific limitation was the instructional duration.

The study was conducted over a total of 20 sessions, 6 for the baseline, 10 for intervention and 4 for maintenance. Extended the time or over the course of the entire school year to use the game and Smartboard in instruction, students may show larger increments of improvement. Another limitation was the small sample size, of 11 students. Although students with various cognitive abilities, they were all classified as moderate cognitive disabilities. This small sample may one serve as a pilot study and findings need to be validated.

In addition, instructional procedures used in the study could be considered a limitation. Students were only able to listen to the story prior to answering the comprehension questions. They were unable to go back and listen to the story again to locate an answer if necessary. This could be considered a limitation due to the students' cognitive levels and the fact they have limited attention spans and may have forgotten the story information as they completed the activity. Lastly, the other limitation included the students' schedules. Some students were pulled out during their scheduled class periods to receive other services, which caused absences including fire drills, and field trips. Thus, their absences may impact their performance.

Implications and Recommendations

The results of this study provide further support for the use of Smartboard technology and interactive games to improve reading comprehension and engagement in high school students with cognitive disabilities.

The interactive reading comprehension games could be used in various types of special education classrooms to help engage students with cognitive disabilities as well as help improve their reading comprehension skills. For example, the use of *Boardmaker* software allows teachers to edit and change comprehension questions to adapt for various students to meet their ability levels. With current trends in education involving more and more technology in the classroom, interactive games such as those used in the study may help these secondary students with moderate cognitive disabilities.

Overall, this study provided support for the use of the Smartboad and interactive games to improve reading comprehension for students with moderate cognitive disabilities. Future research involving a larger sample size and extended sessions could examine further the effects of technology, student engagement, and reading comprehension.

References

Carnahan, C. R., Williamson, P. S., Hollingshead, A., & Israel, M. (2012). Using technology to support balanced literacy for students with significant disabilities. *TEACHING Exceptional Children*, *45*(1), 20-29.

Coleman, M. B., Hurley, K. J., & Cihak, D. F. (2012). Comparing teacher-directed and computer-assisted constant time delay for teaching functional sight words to students with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities*, *47*(3), 280-292.

Council for Exceptional Children. (2013). *Direct instruction (di)*. Retrieved from http://www.cec.sped.org

Coyne, M. D., Zipoli Jr., R.P., Chard, D.J., Faggella-Luby, M., Ruby, M., Santoro, L. E., & Baker, S. (2009). Direct instruction of comprehension: instructional examples from intervention research on listening and reading comprehension. *Reading & Writing Quaterly*, *25*, 221-245.

Crick Software. (2013). *Symbolstix®*. Retrieved from http://www.cricksoft.com/us/products/symbols/symbolstix.aspx

Flores, M. M., & Ganz, J. B. (2007). Effectiveness of direct instruction for teaching statement inference, use of facts and analogies to students with developmental disabilities and reading delays. *Focus on Autism and Other Developmental Disabilities*, *22*(4), 244-251.

Flores, M. M., & Ganz, J. B. (2009). Effects of direct instruction on the reading comprehension of students with autism and developmental disabilities. *Education and Training in Developmental Disabilities*, *44*(1), 39-53.

Grossen, B. (2004). Success of a direct instruction model at a secondary level school with high-risk students. *Reading & Writing Quaterly: Overcoming Learning Difficulties*, *20*(2), 161-178.

Kuder, S. J. (2013). *Teaching students with language and communication disabilities*. (4th ed.). Pearson.

Lee, Y., & Vail, C.O. (2005). Computer-based reading instruction for young children with disabilities. *Journal of Special Education Technology*, *20*(1), 5-18.

Lyons, W., & Thompson, S. A. (2011). Guided reading in inclusive middle years classrooms. *Intervention in School and Clinic*, *47*(3), 158-166.

Massengill, D. (2004). The impact of using guided reading to teach low-literate adults. *Journal of Adolescent & Adult Literacy*, *47*(7), 588-602.

Mayer-Johnson. (2013). *Boardmaker plus! v.6*. Retrieved from http://www.mayer-johnson.com/boardmaker-plus-v-6.

Mechling, L. C., Gast, D. L., & Krupa, K. (2007). Impact of smart board technology: an investigation of sight word reading and observational learning. *Journal of Autism and Developmental Disorders*, *37*, 1869-1882.

Reutzel, D. R., & Cooter , R. B. (2007). *Strategies for reading assessment and instruction helping every child succeed*. (3rd ed.). Upper Saddle River: Pearson Merrill/Prentice Hall.

Simpson, C. G., Spencer, V. G., Button, R., & Rendon, S. (2007). Using guided reading with students with autism spectrum disorders. *TEACHING Exceptional Children Plus*, *4*(1), Article 5.

Wei, X., Blackorby, J., & Schiller, E. (2011). Growth in reading achievement of students with disabilities ages 7 to 17. *Council for Exceptional Children*, *78*(1), 89-106.

Whitby, P. J. S., Leininger, M. L., & Grillo, K. (2012). Tips for using interactive whiteboards to increase participation of students with disabilities. *TEACHING Exceptional Children*, *44*(6), 50-57.

Williams, C., Wright, B., Callaghan, G., & Coughlan, B. (2002). Do children with autism learn to read more readily by computer assisted instruction or traditional book methods?: a pilot study. *Autism*, *6*(1), 71-91.

Xin, J. F., & Sutman, F. X. (2011). Using the smart board in teaching social stories to students with autism. *Teaching Exceptional Children*, *43*(4), 18-24.

Appendix A

Sample Lesson Plan

Type of Class: Special Education Language Arts
Disabilities Served: Multiple Disabled, Autistic, Cognitive Impairment
Grade Level: 9th-10th
Functional or Developmental Level: Pre-K-2.5
Number of Students: 11   **Duration of Lesson:** 40 minutes
Curriculum Area: Reading & Listening Comprehension
Lesson Topic: Wh questions

Part I- Objectives for the Lesson
- Students will be able to answer "Wh" questions about story using the Smartboard with 70% accuracy.
- Students will be able to navigate reading comprehension activity using the Smartboard with 70% accuracy.

Part II- Materials & Equipment
- Smartboard
- *Boardmaker Software*
- Stories from
    - *Five W's* reading level Grade 2 by Remedia Publications
    - *Nonfiction Reading Comprehension* Grade 2 by Teacher Created Resources
    - *Success with Reading Comprehension* Grade 2 by Scholastic
    - *Practice Makes Perfect Reading Comprehension* Grade 2 by Teacher Created Resources

Part III- Activities and Procedures
- Teacher will explain the sequence of class activities for the period.
- Teacher will call one student to the Smartboard to complete the Smartboard activity.
    - During the activity the student will touch the Smartboard and hear the teacher selected story read to them.
    - After the story has been completed the student will touch the board and change the slide.
    - Student will then touch the question and hear it read aloud. Student will then select a picture answer. If the answer is correct the student will hear a positive sound and go on to the next slide. If they are incorrect they will hear a negative sound and have to try again until they select the correct answer. (During this process the teacher will record the student's first answer)
    - This process continues for each student.
    - After each student has completed the activity the students will complete a wrap up activity.

Appendix B

List of Fiction and Nonfiction Stories

Phase	Story Name	Genre
Baseline	Grandma Hugfuzzy	Fiction
Baseline	Famous Storybook Character Remembered	Nonfiction
Baseline	Betsy Ross	Nonfiction
Baseline	The Rescue	Fiction
Baseline	Big Spill Means Big Trouble	Nonfiction
Baseline	On the Beach	Fiction
Intervention	Pony Express Makes Final Ride	Nonfiction
Intervention	Growing Things	Fiction
Intervention	The Platypus	Nonfiction
Intervention	Curious Creature	Fiction
Intervention	American Bald Eagle	Nonfiction
Intervention	Summer Vacation	Fiction
Intervention	Park Ride Turns 100!	Nonfiction
Intervention	The Great Sock Hunt	Fiction
Intervention	The White House	Nonfiction
Intervention	A Long Way to Travel	Fiction
Maintenance	London Bridge is Falling Down	Nonfiction
Maintenance	Smiles	Fiction
Maintenance	Salmon	Nonfiction
Maintenance	Fire!	Fiction

Sample Baseline Assessment

Name:_____

Date:_____

Sea World Welcomes New Baby!

(Orlando, Florida, September 23,1985)

A six-foot-long baby was born today. Her name is Kalina. Most people know her as Baby Shamu. She is a killer whale. She was born at a sea animal park called Sea World. Kalina is the first killer whale born in an animal park.

Kalina was born to a whale named Shamu. Shamu was taken from the wild in 1965. She was taken so that another killer whale would have a friend. His name was Namu.

Shamu ended up going to Sea World. There, she was taken care of by whale trainers. She also learned to do tricks. Each year, thousands of people come to see her do tricks. Some day, Kalina will join the act. When her mother dies, she will become the new Shamu. That is why she is called Baby Shamu.

The trainers at Sea World hope to learn a lot about baby whales. They have already learned a lot from the other whales at Sea World. That is why they get whales from the wild. They want to learn about the whales. They want to learn how to help whales live in the wild.

Directions: Circle the correct answer to each question.
1. Who took care of Shamu?
    A. Trainers at Sea World
    B. Other whales
    C. A doctor

2. What did people go to Sea World to see Shamu do?
    A. Eat
    B. Tricks
    C. Sing

3. When was Shamu taken from the wild?
    A. 1985
    B. 1965
    C. 1973

4. Where does Kalina live?
   A. Disney World
   B. Six Flags
   C. Sea World

5. Why do trainers at Sea World get killer whales from the wild?
   A. They want to learn about whales.
   B. They want to learn to help whales live in the wild.
   C. Both A & B