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Using graphic organizers on ipads to teach reading comprehension skills to high school students with moderate and severe cognitive impairments

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USING GRAPHIC ORGANIZERS ON IPADS TO TEACH READING COMPREHENSION SKILLS TO HIGH SCHOOL STUDENTS WITH MODERATE AND SEVERE COGNITIVE IMPAIRMENTS

by
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Dedication

I would like to dedicate this manuscript to my wonderful family, girlfriend, and to my amazing students without whom none of this would have been possible.

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Abstract

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The purposes of this study were to examine the effects of using graphic organizers (GOs) to improve reading comprehension skills of five high school students with moderate to severe cognitive impairments. The baseline took place during first two weeks of the study, and the students were not provided with any GOs during this phase. The first intervention took place during the next three weeks, and the students were provided with traditional paper GOs during this phase. The second intervention took place during the final three weeks, and the students were provided with the GOs on the iPad during this phase. Average quiz scores were highest for three of the five participants after using the digital GOs, while the other two students performed best after using the paper GOs. Although individual student performance was somewhat inconsistent, the overall results support the use of digital GOs as a successful strategy for improving the reading comprehension skills of students with cognitive impairments.

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CHAPTER 1

INTRODUCTION

Statement of Problems

Reading comprehension is one of the most important skills children need to acquire during their years of schooling. Rather than simply figuring out the meaning of individual words, reading comprehension involves obtaining meaning from the text by taking note of the overall "state of affairs" of what is being read (Cain & Oakhill, 2007). While students in primary school focus more on "learning to read", that focus shifts in later grades to "reading to learn" (Gajria, Jitendra, Sood &, Sacks, 2007). Most of the reading materials in the early elementary grades lack a great deal of implicit meaning and are intended for children to simply develop their fluency skills. However, once children enter into the intermediate grades, they are required to read into the text more and use their background knowledge to understand the meaning of the content (Gardill & Jitendra, 1999). It has been discovered that reading comprehension problems can be strengthened by teaching children how to use the structure of the text to develop a connection to the material, which in turn helps them to remember the information (Bristor, 1993). This is the essence of reading comprehension because if children do not understand what they are reading, the material will be meaningless to them.

Unfortunately, most educators do not teach their students reading comprehension skills in secondary school (Beck, McKeown, Hamilton, & Kucan, 1997; Durkin, 1978-1979; Gillespie & Rasinski, 1989). In general, children are simply told to read the assigned chapters and then answer the questions at the end. Many of the students have little to no idea of what the word "comprehension" even means. Therefore, they are not prepared to make sense of the text structure or infer meaning from the material (e.g. Beck et al., 1997; Durkin, 1978-1979; Gillespie

& Rasinski, 1989). Depending on the type of text structure, students may obtain the information more easily based on how it is written. For example, narrative text can be a lot easier to understand because it mainly consists of stories that are designed to be entertaining and interesting for readers. However, expository text is usually meant to provide readers with factual information that can be difficult to make sense of at times (Pearson & Fielding, 1991). Regardless of the type of text, researchers have found that if students are aware of the text structure, they may apply appropriate strategies for comprehending the material (Cheek, Flippo, & Lindsey, 1989). Clearly, reading comprehension can be a difficult skill for children, regardless of their ability level, to develop and master. Educators are responsible for teaching effective reading comprehension skills so that students can become successful readers.

Typically developing students are able to quickly build up their reading comprehension skills, but these skills are very difficult for students with cognitive impairments mainly because they are unable to make the necessary connections to the text (Lerner, 1993; Montague, Maddux & Dereshiwsky, 1990; Nodine, Barenbaum, & Newcomer, 1985). These students have a much harder time reading and understanding new material, especially content area textbooks that are written in a way that is more difficult to understand than narrative stories (e.g. Armbruster & Anderson, 1988; Beck, McKeown, Hamilton, & Kucan, 1998). Students with cognitive impairments are usually passive learners who do not have the ability to process and organize oral and written information efficiently (Bos & Vaughn, 1994; Lenz, Alley, & Schumaker, 1987; Torgesen, 1982). They have difficulty with making inferences when the meaning of the text is not obvious, and they are unable to distinguish main ideas from irrelevant details, which prevents them from obtaining a complete understanding of the text they are reading (Kameenui & Simmons, 1990; Oakhill & Patel, 1991).

Students with cognitive impairments often have poor academic performance (Stenson, 2006). These students lack processing and organizational skills and have trouble completing assigned tasks unless the information is explicitly laid out in a step-by-step manner. As indicated by Wong (1978), students with cognitive impairments have trouble remembering and organizing verbal information into something meaningful to them. Reading comprehension is certainly one of the areas in which these students struggle due to the fact that very little time is actually spent teaching comprehension skills. For the most part, teachers simply ask students to practice the comprehension skills by answering various questions after their reading, but unfortunately the students might not have learned the necessary skills to complete the assigned tasks (Durkin, 1978-1979; Duffy & McIntyre, 1980).

When teaching comprehension skills, instructors need to model the task, offer opportunities for guided practice, and provide feedback to the students immediately after they complete the task. The demonstration should be clear and controlled, and the teacher should use repetition and provide in-depth explanations whenever introducing a new topic (Rosenshine & Stevens, 1984). The teacher should never assume that the student will just "figure it out" without explicit instruction. During guided practice, the teacher should ask the students various questions in order to test their knowledge of the material and provide feedback. Finally, the students should work either independently or with appropriate assistance from the teacher on activities directly related to what they just learned (Rosenshine & Stevens, 1984).

Research has shown that many children with cognitive impairments can be successful at completing nonverbal tasks independently (Vellutino, Harding, Stager, & Phillips, 1975). For example, they can be adept at using visual or spatial modes of communication (Pirozzolo & Rayner, 1979; Witelson, 1977). Therefore, a visually-based presentation such as a graphic

organizer (GO) may help these students to remember and organize verbal information because the information is already laid out in a clear and recognizable way (Kim, Vaughn, Wanzek, & Wei, 2004). A GO is a visual representation or image that portrays relationships among the most important elements of a learning task (Hudson, Lignugaris-Kraft, & Miller, 1993; Moore & Readence, 1984). The information is presented to the learner in a more structured and organized manner so that he or she will have less trouble understanding the content (Ausubel, 1968). GOs are also effective in pinpointing significant components of text and separating the unimportant details from the key information (DiCecco & Gleason, 2002). In addition, GOs can serve as the groundwork for understanding the material that is being presented (Bernard, 1990). Students with cognitive impairments benefit from having an organizational framework so that they can classify and remember important information in text by using GOs to improve their reading comprehension skills (Gardill & Jitendra, 1999).

Studies that have combined the use of technology with GOs have also found some promising results. For example, computer-based pictorial GOs have been found to help students with mild to moderate disabilities comprehend electronic text-based recipes (Douglas, Ayres, Langone, & Bramlett, 2011). Using a computer to design pictures on GOs improved these students' understanding of the text (Douglas et al., 2011). It seems that computer-assisted instruction has the potential to help students with cognitive impairments improve their reading comprehension skills, but further research is needed to determine if that is truly the case.

In recent years, Apple's iPad has been involved in classroom activities (Shah, 2011). Because of its small size, it can be easily carried around by students. It also has an easy-to-use touch-screen design and visually pleasing programs that are available either for free or at inexpensive prices. These programs can be easily downloaded to the device for students to use.

In addition, the iPad has become a new tool of technology for students with disabilities who struggle to use a regular keyboard and mouse. According to Shah (2011), the iPad as a communication device supports students with cognitive impairments. For example, a student with Down Syndrome has successfully used the device as an alternate means of communication (Shah, 2011). iPads have also been used to introduce science, technology, engineering, and mathematics (STEM) concepts in inclusive preschool classrooms (Aronin & Floyd, 2013). iPads offer a world of possibilities for students with disabilities, and many teachers have made it a priority to integrate this technology into their daily curriculum in order to supplement their instruction.

It is important for teachers to keep their students' skill levels and IEP goals in mind when using iPads during their lessons, as indicated by Dell, Newton, and Petroff (2012). Teachers should ask themselves questions when selecting iPad apps for their students. For example, is the teacher aware of the intended outcome for the use of the app, and what is the likelihood of the app meeting its intended purpose? Teachers should also be able to tell whether the students' level of participation in classroom activities will increase through the use of the app. Finally, it is important for teachers to remember that no matter how much this device may influence a student's success, the teacher should always be the most important factor in determining whether or not the student will be academically successful (Newton & Dell, 2011). Integrating an iPad into instruction seems interesting, but limited studies have been conducted to evaluate its effects. As Newton and Dell (2011) suggested, much research is needed in this area, especially in teaching reading comprehension for students with cognitive impairments.

Significance of the Study

Students with cognitive impairments have difficulty in reading comprehension because of

their low cognitive level, poor memorizing and processing skills, as well as poor organizational skills (Gardill & Jitendra, 1999; DiCecco & Gleason, 2002). In past years, teachers have used a multitude of instructional approaches to teach reading comprehension skills, such as how to create and use visual supports (e.g., GOs). The majority of studies conducted using GOs have involved students without disabilities, and little research has been found for those with cognitive impairments. Despite various studies on the effectiveness of technology in the classroom, iPads are a relatively new type of technology being used in the field. The effect of this new technology needs to be further evaluated. This study attempts to combine GOs and iPads to teach students with cognitive impairments. In addition, it is the goal to extend previous studies on technology in classrooms with the use of iPads in teaching reading comprehension skills.

Statement of Purpose

The purposes of this study are to: (a) examine the effects of GOs on the reading comprehension skills of students with cognitive impairments; (b) evaluate the effects of using GOs on the iPad for students with cognitive impairments; (c) evaluate the students' level of satisfaction when GOs on the iPad are provided in learning reading comprehension skills.

Research Questions

1. Will students with cognitive impairments improve their reading comprehension test scores when GOs are used?
2. Will students with cognitive impairments improve their reading comprehension test scores when GOs on the iPad are presented?
3. Will the students be satisfied with using GOs on the iPad to learn reading comprehension skills?

CHAPTER 2

REVIEW OF LITERATURE

Students with disabilities struggle in many areas of their academic lives, and reading is no exception. Reading comprehension is a skill that is overlooked by many educators who fail to realize that students need to learn how to effectively use reading comprehension strategies. (Durkin, 1978-1979; Duffy & McIntyre, 1980). Students who have difficulty understanding relationships in text need instruction that directly shows how the ideas in the material are linked together (Alexander, Shallert, & Hare, 1991). In addition to developing factual knowledge, students also need to understand how the concepts are related to one another (DiCecco & Gleason, 2002).

Duffelmeyer and Baum (1987) pointed out that teachers need to focus conducting instructional activities as opposed to practice activities. They claimed that teachers should first demonstrate the skill, then provide guided practice, and finally have the students practice independently. Because comprehension is such a vital part of the reading process, it is important for students to begin learning how to interact effectively with text at a young age. Students with cognitive disabilities have a particularly difficult time developing solid reading comprehension skills. These problems often remain consistent throughout the child's entire school career for a variety of reasons (Jitendra & Gajria, 2011). These include difficulty in memorizing what is being read (Spring & Prager, 1992; Warren & Fitzgerald, 1997) and identifying the main ideas and supporting details (Baumann, 1984). Students with cognitive disabilities may also have difficulty disregarding unimportant details (Williams, 1993), inferring information from the material (Holmes, 1985), as well as relating what is currently being taught to what they have already learned (Johnson, Graham, & Harris, 1997).

Improving reading comprehension skills of students with disabilities has been the focus of much research during the past several decades. These students usually experience chronic reading problems from the time they enter school until the time they graduate (Gardill & Jitendra, 1999). One of the major reasons for their reading comprehension issues stems from the fact that they have a less well-developed story schematas, which hinders their ability to comprehend the structure of the material and understand relationships between the various elements in the text (Lerner, 1993; Montague, Maddux & Dereshiwsky, 1990; Nodine, Barenbaum, & Newcomer, 1985). Many students with moderate to severe cognitive disabilities are either beginning readers or are still unable to read in the secondary levels, and a major challenge that teachers face is figuring out how to make grade-level text accessible to these students (Hudson, Browder, & Wakeman, 2013). This chapter reviews research on the effects of GOs as an aid for reading comprehension, as well as how this aid has been used in conjunction with technological devices such as computers, Smart Boards and iPads.

Graphic Organizers for Reading Comprehension

Teachers have been looking for ways to improve their students' reading comprehension skills for the past 35 years (Gajria, Jitendra, Sood & Sacks, 2007), and many different strategies have been examined. Of these, GOs have been considered as a visual aide to support students with learning disabilities (LD). For example, Dimino, Gersten, Carnine, and Blake (1990) used story maps as a visual support, which helped students to pinpoint the main ideas and connect concepts in order to assist them in understanding the material. It has been found that the use of GOs helps to improve the reading comprehension skills of students with LD (Gurney, Gersten, Dimino, & Carnine, 1990).

As an extension of these previous studies, the use of story maps with middle school students

with LD was evaluated by Gardill and Jitendra (1999). In their study, a few important changes to basal comprehension measures were made. In contrast to Dimino et al. (1990), their comprehension tests consisted of an appropriate balance of literal and inferential items that were consistent with current basal reading programs. More items were presented, including both inferential and literal questions that required production responses from the students, as opposed to literal questions about minor details or questions that only required one-word answers (Gardill & Jitendra, 1999). Another way the study differed from previous research was that it did not use the reading program that was currently being used in the participants' classroom. In addition, the skill maintenance after two weeks was examined. The influence of story map procedures on the students' ability to orally retell the stories had also been investigated in order to create an alternate way to assess their comprehension skills (Gardill & Jitendra, 1999).

The results showed that all students improved their scores on the reading comprehension tests. It was found that the story maps gave the reading material a structure from which the students could gather, organize and remember the important elements (e.g., characters, plot, setting, and resolution). This GO was also linked with improvements on the basal comprehension tests, which evaluated the students' reading performance. These results are consistent with those in the previous study (e.g., Dimino et al., 1990), which found that students who received story grammar instruction performed significantly better on basal questions than those without such instruction. However, there was a lower increase in students' basal comprehension scores compared to their story grammar tests. A possible reason for the lower increase in basal comprehension scores was that many of the questions used from the basal reading program in their study did not relate directly to the story elements that were covered during the intervention (Gardill & Jitendra, 1999). Although the results were positive, the

limitations included a small sample size, the researcher's role in instruction to replace the teacher, as well as the participating students' limited opportunities to show their generalization and maintenance skills.

Similar studies were found in recent years. For example, a study conducted by DiCecco and Gleason (2002) used GOs as a post-reading strategy for middle school students with LD. Instead of narrative reading passages, their study tested the participants' knowledge of expository text in social studies. Content area texts pose a daunting challenge to students with disabilities for a variety of reasons. For example, these texts present unfamiliar content, the vocabulary can be very technical, and the syntactical structures can be complex and varied. Also, expository text often deals with abstract concepts that are difficult for the students to understand (Armbruster, 1984). Even if students have solid grade-level reading skills, they may still have a hard time figuring out the meaning of this type of text (Williams, 2005).

The results of the DiCecco and Gleason (2002) study showed that the GOs helped the students to link the information together in order to obtain meaning from the text. Similar to a blueprint an architect uses to build structures, the GO acted as a blueprint for the students to build a structure of the text in their minds (Guastello, Beasley, & Sinatra, 2000). The students showed an improvement in relational knowledge after they used the GOs (DiCecco & Gleason, 2002).

Four different conclusions in teaching students relational knowledge as opposed to factual knowledge were summarized by DiCecco and Gleason (2002). First, GOs did not seem to assist students in remembering the factual information that was required to score well on the fact quizzes. Therefore, if teachers have the instructional objective of recalling factual information, they may not use GOs for that particular lesson (Gleason & Archer, 2001).

Secondly, the longer duration of the intervention period was beneficial to the students. After seven days of instruction, the number of relational knowledge statements made by the GO group was 47 and the No GO group made 34. However, after 20 days of instruction, the GO group made 57 relational knowledge statements, while the No GO group made only 27. These results showed that as instruction went on, the GO group improved their skills while the No GO group showed a decline (DiCecco & Gleason, 2002).

Thirdly, the lesson activities made a difference in how well the two groups performed (DiCecco & Gleason, 2002). For example, when given a multiple choice test that assessed mainly factual knowledge, the control and the experimental groups scored just about the same. However, when the students were given essay tests that required the students to retrieve relational knowledge, the experimental group scored much better (DiCecco & Gleason, 2002). These results provided evidence that the GOs were effective in developing the students' relational knowledge.

Finally, the materials and instructional procedures should be intensive. The instruction was intensive for both the control and experimental groups, but the only difference was that the control group did not have access to the GOs. Even with the extensive amount of instruction that the control group received, there were differences in their ability to retrieve relational knowledge details that would have enhanced their essays (DiCecco & Gleason, 2002). For example, after a discussion and hands-on activity about assembly lines, mass production, and cars becoming less expensive, the No GO group barely talked at all about the assembly line in their essays. The total number of phrases containing the words *assembly line* written by the No GO group was only seven, compared to 21 written by the GO group. These results show that the GOs made an impact on the students being able to store key concepts and relationships in their minds to

translate into written format when writing the essays (DiCecco & Gleason, 2002).

Further, Stenson (2006) provided concept maps to examine students' reading comprehension skills. These concept maps differed from the story maps in Gardill and Jitendra's study (1999) in that they were implemented after the students reading rather than during the reading. The results showed that the students improved their reading comprehension skills, as well as their scores on the STAR test. The STAR test is a technology-based assessment which measures students' current reading levels. The GOs enabled the students to develop a visual image of the material presented in an organized way. During the intervention, the students used matrices to file the information into various categories so that they could recall it easily. Thus, the GOs organized the information into a visual display that would be more meaningful and comprehensive to the students (Stenson, 2006).

Another group of students who struggle in reading comprehension are those with emotional and behavioral disorders (EBD), although there has not been a great deal of research regarding the reading skills of this population (Stone, Boon, Fore III, Bender, & Spencer, 2008). These students have deficits in their reading skills (Babyak, Koorland, & Mathes, 2000; Vaughn, Levy, Coleman, & Bos, 2002), and they are more likely to fail than their typically developing peers (Wagner, Blackorby, & Hebbeler, 1993). However, most studies with this population were focused on their behavior problems rather than academic skills (Levy & Chard, 2001). The study of Stone et al. (2008) examined text maps known as story maps to evaluate the reading comprehension skills of students with EBD. A total of four students participated, none of whom had any previous documented experience using story maps. Their reading comprehension performance was far below grade level (Stone et al., 2008).

Two types of story maps were used: one was teacher-generated and another was student-

generated. The students were then assessed with quizzes with 10-20 fill-in-the-blank questions. During the baseline, the students were simply asked to read a passage from their textbook and answer questions after reading. The instructor made only neutral statements focused on how the students were behaving, rather than providing them with any useful information about the reading passage. A minimal amount of academic assistance was provided because this unfortunately is typical of many secondary teacher-presented reading lessons. During the first intervention, the students were presented with the teacher-generated story maps. They each worked individually with the teacher to complete the story maps as they read the passage. During this phase, the students were provided with explicit instruction on how to complete the story map properly. After reading, the students were required to answer the questions following the passage. The third and final phase of the study focused on having the students create their own story maps by reading small parts of the passage and writing down important questions. The teacher would help the students answer questions as needed, but the students did not receive any assistance in developing questions for their story maps. After reading the passage independently and answering the questions before and after reading, the students answered the comprehension questions. The results showed that all four of the participants greatly improved their reading comprehension scores using the story maps to supplement their learning (Stone et al., 2008).

The students also specifically stated that the story maps helped them to understand and remember the text more efficiently. However, the students admitted that although the story maps helped them understand the stories better, they were usually disinterested in and disconnected from the material. There were times when the students performed poorly during the sessions, but the researchers claimed that it was not due to their inability to correctly complete the work.

Instead, the problem most likely stemmed from the students' lack of interest in the material (Stone et al., 2008).

Similar studies focused on students in the elementary and middle school grades with specific learning disabilities found that story maps could help students improve their reading comprehension scores (e.g. Boulineau, Fore, Hagan-Burke, & Burke, 2004; Li, 2007; Onachukwo, Boon, Fore, & Bender, 2007). Also, using story maps helped students with EBD to improve their reading comprehension successfully. Although the participants' scores improved, their overall attention levels and performance in other academic subject areas did not increase much (Stone et al., 2008). In general, secondary students with EBD have not been exposed to different kinds of academic instructional strategies (Wehby, Falk, Barton-Arwood, Lane, & Cooley, 2003; Wehby, Lane, & Falk, 2003).

GOs are also provided to teach students with autism to improve their comprehension skills. Zakas, Browder, Ahlgrim-Delzell, and Heafner (2013) examined the effect of modified GOs on teaching story grammar with GOs to improve the text comprehension of students with autism. The three students participating in the study aged from 11-15 in a middle school. Before the baseline, the students learned some important vocabulary words that were related to story grammar. These words included: "*event, location, people, time, detail, sequence, and outcome*". The students were required to correctly define each word with at least 87% accuracy and complete a vocabulary matching map. Then the teacher directed each student to read five to six modified social studies passages either aloud or silently. Next, the teacher gave the students a modified GO to independently complete after reading each passage without instruction. Each one of the trials lasted from 10-30 minutes, and one trial was completed per day.

During the intervention, the students received explicit instruction on how to complete the

GOs while reading the passage. The teacher used instructional scripts to ask specific questions. Each of the GOs contained nine items, and the students needed to be able to independently answer at least 56% of those items for three instructional sessions in a row. This phase of the study was carried out with the purpose of having the students learn how to properly use the GO, and if they responded incorrectly to any of the items, the teacher would provide further explanation and give them a chance to answer again (Zakas et al., 2013).

During the generalization, the students were given new passages and told to complete the GOs without assistance. After the students completed the task, the teacher scored their correct/incorrect responses. If the students answered incorrectly on any specific item, the teacher would use the instructional scripts in an attempt to draw out the correct responses. Once the students were able to answer at least 78% of the items on the GO correctly for at least three trials in a row, they were ready to move on to the maintenance phase (Zakas et al., 2013). The maintenance phase was the final part of the study, and it was conducted the same way as the generalization phase. However, the students had to wait varying amounts of time before this phase began. When students made mistakes on any of the items in the maintenance phase, they were told to consult their vocabulary guide for assistance. If they still answered incorrectly after using the guide, the specific terms would be reviewed with the teacher following the instructional scripts.

The results showed that there was some correlation between using GOs and the student performance with correct responses to the comprehension questions. All three participants were able to state the meaning of each vocabulary term on the GO and find the answers in the text. They were also able to record the correct answers on their GOs after instruction. During the generalization, all three students were able to use the GOs to answer questions after reading

unfamiliar text. They used the knowledge and skills gained during the intervention and applied these skills to new reading. Students with autism benefitted from having a visual display such as a GO to organize the important parts of expository text (Zakas et al., 2013).

Students with disabilities also have difficulty in reading social studies text because these texts include unfamiliar words and contents (Marzano, 2004; VanSledright, 2011). In order to make this type of text more accessible to students with autism, it is necessary to simplify the text passages and incorporate GOs to present the main idea (Zakas et al., 2013). Gadria et al. (2007) found that students with mild disabilities benefit from the use of GOs in the four main academic subject areas: language arts, math, science, and social studies. Zakas et al.'s study (2013) extended to include students with autism. Two limitations were noted in these two studies. These included the small number of participants, as well as the fact that the students were simply required to learn facts such as names and dates from the expository text. Although a promising development on how to instruct students with autism has been found, further research using similar methods to instruct students in other academic subject areas with varying types of text structures is needed.

Using Technology in Reading Comprehension

In the 1980s, technology such as video cassette tapes was used to teach reading comprehension skills to students with disabilities (Bristor, 1993). It has been found that video presentations motivated students in reading with a visual representation of the material (Ploghoft & Sheldon, 1983). If children are interested in a topic area, they will be more likely to read and understand the material (Cheek et al., 1989). However, the amount of technology available for teachers in instruction was rather limited in the past. In recent years, there has been a drastic increase in the amount of technology available for teachers, such as interactive whiteboards

(Whitby, Leininger, & Grillo, 2012), computers (Douglas et al., 2011), and tablet devices such as iPads (McClanahan, Williams, Kennedy, & Tate, 2012).

Smart Boards

The Smart Board is a large electronic board with touch-screen capabilities. This device was used in Xin and Sutman's study (2011) to examine its effect on social stories instruction for students with autism. The two special education teachers involved were asked to create social stories with images that could be shown on the Smart Board and then imitated by the students. Each student was provided with individualized instruction from the teachers while viewing various slides of pictures that demonstrated appropriate behaviors in different situations. The teacher provided instruction on how to touch the screen of the Smart Board in order to progress through the various slides, and then the students practiced the skills on their own. The teachers followed a six-step process to plan and implement the social story lesson using the Smart Board. The steps are as follows: 1) Observing the students for three weeks to identify the behavior to be taught, 2) Creating a social story that effectively teaches the appropriate replacement behaviors, 3) Using a PowerPoint program on the computer to present the social story to the students, 4) Using a self-modeling strategy to teach the students the appropriate behavior and using a digital camera to capture their own appropriate behavior, 5) Teaching the children how to use the Smart Board to learn their social story, and 6) Having the children practice the newly learned skills in real-life situations.

The results indicated that both students appeared to benefit from their learning experiences with the Smart Board. The social stories helped Calvin, the boy involved in the study, to raise his hand more often throughout the school day. They also helped a girl named Marcy to initiate more verbal interactions with her peers. The key for proper social stories instruction is that the

students understand the story being taught and also understand that they need to show the appropriate replacement behaviors whenever the opportunity is presented. The self-modeling aspect is also very important in order to emphasize to the students that they are the ones who need to consistently perform appropriate behaviors in social situations (Xin & Sutman, 2011). It was found that the use of the Smart Board appeared to keep the students engaged and motivated to learn the material. They enjoyed being able to actually touch the screen themselves and see their own images on the big screen (Xin & Sutman, 2011). In addition, students with autism increased their interest and motivation to learn when they received interactive instruction through technological devices such as Smart Boards. However, it is also important to remember that technology should only be used to supplement instruction. Quality teaching and learning still depends on an instructor's ability to plan engaging lessons with clear and measurable learning objectives (Crawford, Schlager, Penuel, & Toyama, 2008).

Computer-Assisted Instruction

Another piece of technology that has received a great deal of attention in recent years is the computer-based instructional program. Douglas et al. (2011) examined the effects of a computer-based instructional program on the comprehension skills of three students with moderate intellectual disabilities. The program used pictorial GOs as an aid to help students understand electronic text-based recipes. Children with intellectual disabilities have difficulty developing their literacy skills for a variety of reasons, including their lack of attention to important details (Westling & Fox, 2000), an inability to activate their prior knowledge of topics (Hedrick, Katims, & Carr, 1999), and a considerably below-average working memory (Brooks & McCauley, 1984). Many of these students benefit from having assistive technology devices to aid in their reading comprehension, but they may also need additional instructional supports such

as pictorial GOs in order for full comprehension to occur (Douglas et al., 2011).

The researchers in the Douglas et al. (2011) study argued that traditional GOs with text may have the unwanted effect of making the learning task more complex than simply not using them at all. Therefore, they decided to use pictorial GOs instead because all three of the participants in their study were very early readers with limited vocabulary. Other studies have been performed using photographs and pictures prompts to aid students in learning various skills, such as vocational skills instruction (Carson, Gast, & Ayres, 2008; West, 2008), community skills (Alberto, Cihak, & Gama, 2005), and meal preparation (Lancioni, O'Reilly, Seedhouse, Furniss, & Cunha, 2000). The Douglas et al. (2011) study attempted to extend previous research by combining picture prompts with the GOs, as well as e-text supplemented with text-to-speech in order to help the students understand the food recipes.

The three participants in the study were from a rural public middle school receiving special education services in a self-contained classroom for most of the day. They all had a decent sight word vocabulary, but were unable to identify the words contained in the recipes being used for the study. The students were also able to use a mouse to successfully navigate through computer software programs, but none of them had any prior experience in creating pictorial GOs related to the reading material.

During the baseline, the students were shown recipes on the computer and required to navigate through the various slides presenting the ingredients, the materials needed, and the cooking steps. All of the words were stated out loud using text-to-speech. The students were also given blank GOs with a group of pictures, but they were not instructed on how to correctly complete their GO. They were given the following prompts: 1) Tell me how to make a…. 2) What ingredients are needed to make….? 3) What appliances and utensils are needed to

make….? Each student was given 10 seconds to begin responding to the questions and one minute to complete their responses. For the last two questions, the students were able to hear the question again if they did not respond within 10 seconds, but for the first question they were not given a second chance (Douglas et al., 2011).

During the intervention, the students were given instructional slides to inform them of the correct category to place the images presented on the table beside the computer. They were asked which picture described the step they just heard and required to select the correct picture. Once they responded correctly, the computer would advance to the next slide and tell the students where to place the picture they chose. The students were then required to find the same picture on the table and place it on the correct spot on the GO. Once the students were able to respond with at least 90% accuracy for three sessions in a row, they were ready to use the GO independently. During the independence phase, the students were shown recipes on the computer without the previous slides to assist them in selecting the appropriate images. This was the exact same amount of information that they had been given during the baseline. After the intervention, the students were interviewed about their experience. All three participants said that they enjoyed using the computer, and they talked about how the pictorial GOs were easy to develop and use. They also preferred to have the pictures as a visual support rather than having no supports after listening to the steps in the recipe (Douglas et al., 2011).

The results showed that students with intellectual disabilities benefitted from receiving computer-based instruction as an aid for developing acquisition skills (e.g., Davies, Stock, & Wehmeyer, 2003; Mechling, Gast, & Barthold, 2003; Mechling & Ortega-Hurndon, 2007), and improved their understanding of electronic text-based recipes after learning how to use a pictorial GO as a visual support (Douglas et al., 2011). It was found that the students benefitted

from having the pictures grouped strategically so that they could refer to the pictures in the correct column of the GO. They were able to independently organize the pictures, which most likely would not have been possible had the students used traditional paper-based GOs. The pictorial GOs may be useful in helping with comprehension and retelling skills, as well as with written and gestural expression (Douglas et al., 2011).

Stetter and Hughes (2011) conducted a similar study, but instead used computer-assisted instruction (CAI) with nine high school students with learning disabilities. In this study, computers were used to present a story mapping strategy to help the students improve their reading comprehension skills. All students selected for the study were from a large, urban high school in the United States, and the majority of them were from lower income families. They were all classified as having learning disabilities in reading, and their scores on the Gates-MacGinitie (MacGinitie, MacGinitie, Maria, & Dreyer, 2001) reading comprehension tests were at the lower end of the scale. During the baseline, the students were taught how to use the computer program to read through the story and answer the questions. Next, the students were given time to use the program on their own, which consisted of directions, a page with a list of vocabulary words and their definitions, the text of the story, and a 20-question quiz at the end. The students were not provided with any explicit instruction after the first training session, but the researcher did answer non-academic questions. Of the nine students involved, three of them were in the Baseline Group and never moved on to the intervention phase. Another three students were in the Intervention Group, and the final three were in the Delayed Intervention Group. This group moved on to the intervention after 20 baseline sessions in order to allow the Intervention Group to be involved in at least 10 intervention sessions.

During the intervention, the students participated in a two-day training in which the

researcher first used an instructional script to go over the various story elements (setting, plot, character, and theme) and have the students work together to complete the story map. Subsequently, the students independently completed the comprehension quiz. On the second day, the researcher used an instructional script to review the previous day's story, and then the process was repeated for 30 sessions. The final part of the study was the maintenance, which occurred two weeks after the end of the intervention. During the maintenance, one student from each group was chosen to complete reading activities that were exactly the same as the ones from the baseline for five more sessions.

The results showed minimal to no increase in the reading comprehension skills of the participating students. However, seven out of the nine participants improved their scores on the Gates-MacGinitie assessment after the study was complete (Stetter & Hughes, 2011). One possible reason for the lack of improvement as expressed by the researchers could have been due to the fact that the students progressed too quickly through the computer programs and did not take the time to read through their reference pages. It was noted that of the 46 minutes allotted for each session, only about one third of that time was spent during the baseline and about one half for the intervention. The students who seemed to use the reference pages more often were the same students who showed improvement on the Gates-MacGinitie test after the study (Stetter & Hughes, 2011).

Stetter and Hughes (2011) also pointed out that the students' overall lack of improvement could have been due in part to their lack of motivation in reading through the materials as thoroughly as was necessary. There were only two in-depth teacher-led training sessions, and perhaps the students needed to receive more explicit instruction. Students with LD often benefit from more teacher-led instruction than typically developing students, especially when adding the

element of technology into a lesson (Dynarski et al., 2007). According to the results of the student satisfaction survey, they did prefer using the computer program over a teacher-directed lesson. However, the computer program may have caused them to become too passive since their attention was not being re-directed by the teacher as often (Stetter & Hughes, 2011). Although this study did not show extremely promising results, it did help to affirm the idea that teachers need to take more responsibility in properly implementing technology so that their students can be more successful (Dynarski et al., 2007).

iPads

Tablet computers such as iPads have expanded the possibilities for mobile learning immensely in recent years because they provide students and teachers with a highly portable device that allows students to learn and access information wherever they need (Hutchinson, Beschorner, & Schmidt-Crawford, 2012). Students no longer have to go to computer labs to access computers; tablet computers can be used anytime and at any point during the school day (Brand & Kinash, 2010). To date, iPads are still a relatively new technological device being used in school. It is important for teachers to examine how such a device can impact their students' learning. In their study, Hutchinson et al. (2012) focused on how iPads could help fourth-graders to develop effective reading practices, specifically using the iPad to integrate digital texts into the curriculum to improve the students' reading skills. Mrs. Dill and her 23 students participated in this study. Mrs. Dill was asked to incorporate iPads into her instruction on a daily basis for three weeks, and although she did not have experience using iPads prior to this study, she was able to quickly design appropriate lessons when the study began (Hutchinson et al., 2012). Three separate lessons were developed with the researchers and the teacher working together to find apps on the iPad that would best help the students.

The first lesson addressed the reading comprehension strategy of sequencing, and the iPad app adopted is called *Popplet*. *Popplet* is a type of GO serving as a blank canvas to allow users to add boxes in order to extend the sequence of ideas. Hand-written or type-written text, as well as pictures, can be added to the boxes to create a more detailed and visually-pleasing GO. The second lesson focused on independent reading skills, and the app used is called *iBooks*. This app allows users to choose a book at their reading level from a virtual bookstore and learn how to communicate digitally with other students in class by leaving a virtual bookmark. The students also gained experience in navigating through the various features of the digital text, which was a skill they had not previously learned. The third lesson focused on the reading comprehension strategy of visualization. The app selected is called *Doodle Buddy*, which allows users to "paint" pictures on the screen with their fingers using various features such as markers, stamps, and glitter. The students took turns "painting" their pictures after reading a sentence or paragraph. They had to visualize what was happening in the text and then draw a corresponding image. Many of the students changed their pictures multiple times and selected the one that they thought best represented what they read in the text. This option showed that they were really thinking about and visualizing the event that was occurring in the story.

The results showed that the teacher achieved her goal of curricular integration of technology, rather than simply using the iPads as an afterthought to the lessons (Hutchinson et al., 2012). It was found that iPads can greatly enhance student learning, and teachers should be encouraged to choose appropriate apps for their instruction.

Hutchinson et al. (2012) also mentioned a few things that teachers should take into consideration before having their students use iPads independently. One really important consideration is that the touch screen is overly sensitive at times, which can cause the students to

access features of the apps unintentionally. Therefore, they may need some training on finger movement. This finding is similar to a discovery that Aronin and Floyd (2013) made in their study on preschool children using iPads to introduce STEM concepts. It seems important for teachers to explicitly teach their students how to use the device, such as showing students how to hold and handle it with the appropriate amount of pressure to navigate through apps successfully. It was also found that the students' motivation to use the iPads was high, and many of the apps they used aligned with the common preschool goals (Aronin & Floyd, 2013). According to these researchers, the iPad may help students with poor fine motor skills to practice and improve their skills in a highly motivating manner. iPads seem to provide academic benefits by addressing students' curricular goals and their specific needs (Aronin & Floyd, 2013). Because this device is still fairly new, limited studies could be found for students with disabilities in learning reading comprehension skills.

Summary

A major challenge that special education teachers face on a daily basis is figuring out how to make the curriculum accessible to their students. Two types of tools that can help these students achieve success in the classroom are GOs and technological devices. The above review of literature summarized different studies that have focused on using GOs as an instructional tool for students with disabilities, as well as studies on using various types of technology in the classroom. The results showed that students with disabilities benefit from using GOs as a visual support for enhancing their reading comprehension skills (e.g., Dimino et al., 1990; Gardill & Jitendra, 1999; DiCecco & Gleason, 2002; Stenson, 2006; Zakas et al., 2013) and using various types of technology in the classroom can motivate students and enhance their learning experiences when they are implemented in an effective way (e.g., Xin & Sutman, 2011; Douglas

et al., 2011; Hutchinson et al., 2012).

GOs have proven to be a very useful tool in helping students with disabilities to develop their reading comprehension skills. Their benefits include: 1) helping students identify the most important parts of the text (Reutzel, 1985), 2) linking information together in order to obtain meaning from the text (DiCecco & Gleason, 2002), 3) organizing information into a visual display that is more meaningful and understandable (Stenson, 2006), 4) activating their previous knowledge for the reading material (Levin & Pressley, 1981), 5) helping students to produce their own questions while reading (Beck & McKeown, 1991), and 6) helping students to summarize the material effectively (Taylor, 1982).

Research has also shown that the use of various types of technology has helped to enhance student learning in the classroom. For example, Smart Boards helped to keep students focused and engaged in lessons, and the students benefitted from having their pictures taken and seeing themselves perform the appropriate behaviors on the big screen (e.g., Xin & Sutman, 2011). Computer-based instructional programs with picture prompts and e-text supplemented with text-to-speech helped students better understand food recipes (e.g., Douglas et al., 2011). Mobile tablet computers such as iPads greatly improved student learning when apps were selected to align with the specific learning goals in the lesson (e.g., Hutchinson et al., 2012; Aronin & Floyd, 2013). After reviewing the research, it is evident that most studies were conducted for students with learning disabilities, emotional/behavioral disabilities, and autism spectrum disorders. Very little research was found for students with cognitive impairments. More studies are needed in this area to validate the findings in the use of technology, especially for students with cognitive impairments.

CHAPTER 3

METHODS

Participants

The five participants involved in this study are currently enrolled at a private school in New Jersey that serves children with moderate to severe disabilities, ages 3-21. All participants (*n*=5) range from 16-18 years old and have cognitive impairments that negatively affect their ability to understand and retain information, which made them good candidates for this study on reading comprehension. The selection criterion for this study included the following: (1) the student must be officially enrolled full-time at the private school where the study was being performed, (2) the student must have a medically diagnosed disability that inhibits his/her level of cognitive functioning, (3) the student must be able to understand the English language sufficiently enough to respond to simple questions, (4) the student must be able to hold a pencil and circle his/her chosen answers on a quiz, and (5) the student must be able to read on his/her own or at least repeat words after they are read by the teacher. Table 1 reveals some general information about each participant.

Two of the participants in the study have Down Syndrome, two have Autism Spectrum Disorder, and the final student has Cerebral Palsy. The participants' diagnoses had been given independently of the research in the current study by various professionals, and their disabilities are documented in both their medical records and their Individualized Education Plans (IEPs). All participants are in the same classroom throughout the entire school day other than when they are pulled out for either physical, occupational or speech therapy services. There are also three other students in the classroom whom the teacher decided to not include in this study. Two of these students are too low-functioning to complete the required tasks, and the third student does

not understand enough English to be able to successfully comprehend the stories on his own.

The first of the five participants was a high-functioning sixteen year-old boy with a medical diagnosis of Down Syndrome named Andrew (all names used are pseudonyms). He has been enrolled at this school since preschool, and he currently receives speech therapy services two times per week. His academic skills and abilities in the areas of general information, reading, math, writing, and spoken language (the *Young Children's Achievement Test*) were below 1%tile. In addition, his verbal comprehension, perceptual reasoning, and working memory as measured by the *Wechsler Intelligence Scale for Children* were below 1%tile. Since the time of these assessments, Andrew has progressed greatly in all academic areas, and at the time of this study Andrew was able to read at a third grade (8-9 year-old) level. Therefore, all of the stories he read during the study were at this level. His ability to understand and follow instructions is quite good, and he was able to complete the required tasks with minimal prompting. He did not exhibit any behavioral issues that hindered his performance in any way.

The second participant named Molly is a seventeen year-old girl with a medical diagnosis of Down Syndrome, who is currently reading at a high kindergarten to low first grade level. All of the stories she read during the study were at a low first grade (4-7 year-old) level. Her academic skills are lower and her attention span is shorter than Andrew's, so she needed to be re-directed often, and she required an environment with minimal distractions. Similarly to Andrew, Molly has been attending this school since preschool, and she also receives speech therapy two times per week. She has trouble expressing herself verbally because of her poor vocabulary knowledge and articulation difficulties, and her auditory processing abilities are also quite low.

The third participant was a sixteen year-old boy named Albert who has a medical diagnosis of Autistic Disorder and Communication Disorder, Not Otherwise Specified. Like Molly, he is

reading at a high kindergarten to low first grade level. Albert read the same stories as Molly during this study. He receives speech therapy two times per week, and he has been attending this school since the fall of 2012. Albert is a well-behaved boy who works hard, but he has some trouble following directions and requires frequent prompting in order to stay on task. According to the results of the *Wechsler Individual Achievement Test (WIAT-II)* from his school file, he was below 0.1%tile in reading composite, mathematics composite, and language composite. Albert was also given speech and language evaluations on 2/7/2008 and 2/20/2008. He achieved a standard score of 79 (8%tile rank) on the *Receptive One Word Picture Vocabulary Test (ROWPVT)* and a 64 (1%tile rank) on the *Expressive One Word Picture Vocabulary Test (EOWPVT).*

The fourth participant was an eighteen year-old boy named James, and he has been given a medical diagnosis of Pervasive Developmental Disorder (PDD). Like Albert, James has been attending the school since the fall of 2012. He receives speech therapy three times per week, and he uses a communication device throughout the school day because he is minimally verbal. James is unable to read on his own, so he was given stories at a kindergarten (4-6 year-old) level and asked to repeat the words after the teacher read them. He tends to get very distracted and sometimes becomes agitated by the other students in the class, especially when the noise levels are high. Therefore, it was important for James to be instructed in a quiet, distraction-free environment. According to the *Vineland Adaptive Behavior Scales – II* assessment, James achieved below 0.1%tile rank in the area of communication, daily living, and socialization. This indicated that James's adaptive level in all areas was considered to be in the "low" range of ability.

The fifth and final participant was an eighteen year-old boy named Nick, who has been

given a medical diagnosis of Left Hemiplegic Pattern Cerebral Palsy. He has been attending the school since preschool, and he receives speech therapy services two times per week. Similarly to James, Nick is also unable to read on his own, so he obtained information from the stories by listening to them and repeating the words that the teacher read. He was given the same stories as James, and he also uses a communication device because of his limited ability to express himself verbally. Nick has difficulty with focusing for long periods of time, so he needed to be redirected frequently in order to stay on task throughout the sessions. His most recently documented psychological assessment, the *General Adaptive Composite (GAC)* of the *Adaptive Behavior Assessment System – II Parent Form,* indicated that his overall adaptive behavior can be described as in the "extremely low" range of functioning. He has also been given two speech and language assessments (i.e., the *Expressive One-Word Picture Vocabulary Test* and the *Receptive One-Word Picture Vocabulary Test*). Nick achieved below 1%tile on both of these assessments.

Setting

The study took place in the participants' classroom at their attending school, which is where they currently spend the majority of their school day. The school serves students from various counties in Southern New Jersey, so the students come from different areas and socioeconomic backgrounds. The sessions occurred at times when the students were available, so the teacher scheduled around their individual pull-out therapy sessions. The sessions were conducted with the other three non-participating students in the classroom as well, but their quizzes were not scored or kept for data collection purposes. The students were instructed individually at a table in the back of the classroom for each of their sessions. During the baseline, they were only given the story booklets, pencils and quizzes. During the first intervention, they were given a GO sheet

as well, and during the second intervention the GO sheet was replaced by an iPad. All of the students seemed to benefit from receiving individual instruction in a relatively quiet area of the classroom.

Variables and Instruments

Independent Variables

The independent variables were visual organization by using a story map sheet, the traditional paper GOs, and an app called *Reading Comprehension Booster* (Stump & Beninghof, 2014), the GO on the iPad, which were used for two stages of intervention for each participant. The story map sheets (Houghton Mifflin Harcourt, 2013) were published by the Houghton Mifflin Company and were accessible online via their website: http://www.eduplace.com/graphicorganizer. The website clearly states that the GOs are permitted to be printed and copied for classroom use. Houghton Mifflin Harcourt is one of the world's longest running publishing houses and largest providers of pre-K-12 educator materials.

Students completed the story map sheets during the first intervention. For the second intervention, the students each had access to their own individual iPad tablet computers, and they used *Reading Comprehension Booster* (Stump & Beninghof, 2014). This app is an interactive GO that allows students to develop a deeper understanding of the material they are reading by identifying story elements (characters, plot, and setting), sequencing story events and identifying the main idea and supporting details (Stump & Beninghof, 2014). The two non-readers also used touch talkers to help them complete the quizzes.

Dependent Variables

Reading comprehension stories from Reading A-Z (Cambium Learning, 2014) were used to measure students' reading comprehension skills. The stories were obtained online via their

website: http://www.readinga-z.com. The stories were accompanied by comprehension quizzes (see Appendix B for sample copies of the students' quizzes), which were also obtained from the Reading A-Z website. The quizzes corresponding to the kindergarten level stories each contained five multiple choice questions with two possible answer choices for each question. The quizzes corresponding to the first grade level stories each contained five multiple choice questions with three possible answer choices for each question. There was also one open-ended question on each quiz, which was omitted. The quizzes corresponding to the third grade level stories each contained 10-12 multiple choice questions with four answer choices for each question. There were also two open-ended questions on each quiz, which were omitted. There was no time limitation, so the students were able to take as long as they needed to complete the quiz. After the quizzes were completed, the teacher added up the number of correct responses and calculated a percentage score for each child. The testing conditions were the same for each of the participants, and the students used material that was at their ability level. *Reading A-Z* (Cambium Learning, 2014) provides leveled stories that are appropriate for the students' current reading levels. The website also provides practice worksheets and comprehension quizzes that teachers can use to enhance student learning. For this study, the students read the stories and completed the corresponding review quizzes. Each student was required to read thirteen teacher-selected stories at their own reading levels. Three stories were read during baseline, five were read during the first intervention, and five were read during the second intervention.

After each session was completed, the teacher graded the comprehension quizzes and gave each participant a percentage score. After all of the lessons were taught and the quizzes were completed, the results were graphed in order to compare the students' scores from the beginning to the end of the study. Finally, the students were given a satisfaction survey to get an

idea of how well they liked using the GOs on the iPads in comparison to the paper GO and no GO. The survey also asked whether or not they understood the stories better when the GOs on the iPads were used in comparison to the paper GOs and no GO.

Research Design

A single subject research design with ABC phases was used during this study. During Phase A, the baseline phase, the students were required to read three stories at their reading level and complete the corresponding review quizzes. The baseline phase took place over a two-week period. During Phase B, the first intervention period, the students were required to complete a paper GO while reading the story the first time. The story was then re-read by the students and the teacher had them stop at various points to answer comprehension questions, and they were required to use the GOs to help them respond to the questions. The first intervention phase took place over a three-week period. During Phase C, the second intervention period, the students were required to complete the GOs on their iPads while reading the story the first time. The same procedure as in the first intervention period was used during this phase, except the paper GOs were replaced by GOs on the iPads. The second intervention phase also took place over a three-week period.

Procedures

This study took place over an eight week period and was conducted by the classroom teacher. It consisted of the following procedures:

Measurement Procedures

The first two weeks (Phase A) consisted of collecting baseline data on the students' ability to answer comprehension questions about stories at their reading levels. The students each worked individually with the teacher at the back table. They were first asked to read the stories

out loud, and the teacher helped them to sound out any words with which they were having difficulty. The two non-readers had each word read to them and were required to repeat the words after hearing them. During this phase, the teacher did not ask any specific comprehension questions that might aid in the students' understanding of the stories. Upon finishing the stories, the students were immediately given the comprehension quizzes. The teacher assisted the students as needed by reading the questions and answer choices if the students were having difficulty. Since the two non-readers were unable to discriminate between the two answer choices on their own, they were told to press one of the two touch-talkers that were placed in front of them. One device said, "The answer is A" and the other device said, "The answer is B". After pressing one of the buttons, the student was directed by the teacher to circle the answer that he chose. The teacher pointed to the student's chosen answer so that the student would know where to circle.

Instructional Procedures

During weeks three through five, the first intervention period (Phase B) took place. During this phase, the teacher introduced the paper GOs that the students were required to complete while reading through the stories the first time (see Appendix A for a blank template and sample student copies of the GO that was used). For Phase B, each student was individually instructed in two separate sessions (the amount of time required for each session varied depending on the student). The first of the two sessions consisted of the following: (1) the teacher went over each element that would need to be completed, such as setting, characters, problem, events, resolution, main idea and supporting details. (2) The students read through the story and the teacher stopped them at various points to fill in each category of their GO. The session ended once the students had read their entire story and completed the GOs. During the second of the two sessions in

Phase B, the students read through the stories and the teacher stopped them at various points to ask explicit comprehension questions (e.g., “What is this character doing?”, “What is happening in the story right now?”, “What event lead to this happening”, and “What do you think will happen next?”). For the non-verbal and non-reading students, the teacher told them to point to specific pictures in the stories and asked questions like, “Who is throwing the ball?” or say, “Show me the what the person is holding” in order for the students to gain a better understanding of the stories. After reading the stories and responding to the teacher’s questions, the students were immediately given the comprehension quiz to complete. The quizzes were completed the same way as was described in Phase A.

During weeks six through eight (Phase C), the second intervention period took place. During this period, the students were once again individually instructed at the back table of the classroom. Phase C also consisted of two separate sessions for each student. The first session consisted of the students learning how to using the *Reading Comprehension Booster* app on their iPads before reading the stories (see Appendix C for sample pictures of the students’ work on the app). The students were first required to type in their names on the touch keyboard and take a picture of the book they were reading for that session. The teacher then showed them how to navigate through the app, which contained all of the same elements as the previously used paper GO in Phase B. Once they were comfortable navigating through the app, the students began reading their stories and filling in the various parts of the GO. Any students who needed help typing on the keyboard were given hand-over-hand assistance from the teacher. Once the students had read the entire story and completed the GO on the iPad, the first session of Phase C was over. The second session in Phase C was a replication of the second session in Phase B, during which the students read their stories and were stopped at various points to answer

comprehension questions. The only difference was that in Phase C, the GOs on the iPads were used as opposed to the paper GOs.

After the study was over, the students were given a satisfaction survey (see Appendix D) that asked them several questions about their experience during the study. The intent of the survey was also to assess which method of instruction enabled the students to best understand their reading materials. The survey asked the following questions: (1) How happy were you with using no graphic organizers while reading the stories? (2) How happy were you with using the paper graphic organizers while reading the stories? (3) How happy were you with using the graphic organizers on the iPad while reading the stories? (4) How well do you feel that you understood the stories when no graphic organizers were used? (5) How well do you feel that you understood the stories when paper graphic organizers were used? (6) How well do you feel that you understood the stories when graphic organizers on the iPad were used? They answered each question on a one to four scale. For the first three questions, 1 = Very Unhappy, 2 = Unhappy, 3 = Happy, and 4 = Very Happy. For the final three questions, 1 = Not Well At All, 2 = Somewhat Well, 3 = Well, and 4 = Very Well.

Data Analysis

The students' scores on the assessments at the end of each data collection period were graphed and compared to the scores they received during the baseline Phase A. The focus of the study was to determine which intervention method was most effective. Was the use of traditional paper GOs the more effective method or did the integration of technology (GOs on the iPads) prove to be a better method for improving the students' reading comprehension skills? Or was it more effective when no GOs were used at all? The data was recorded based on the number of correct responses that the students gave on each quiz. The number of correct

responses were divided by the total number of questions on the quiz and multiplied by 100 in order to obtain the percentage score. The results were then graphed in order to show each individual student's progress from the first quiz to the last. The overall results of the student satisfaction survey were also recorded and graphed. The outcomes for each participant will be reported and displayed in chapter 4.

Table 1

General Information of Participating Students

Student	Gender	Age	Grade	Reading Grade Level
Andrew	Male	17	11	3
Molly	Female	17.11	11	1
Albert	Male	16.11	11	1
James	Male	18.9	12	Pre-K
Nick	Male	18.2	12	Pre-K

CHAPTER 4

RESULTS

Visual inspection of the data collected from this study indicates that all five participants benefitted from using GOs because their average quiz scores were higher in the intervention phases than the baseline. Nick scored lowest on the first intervention phase, but his highest scores came during the second intervention. He was the only participant whose baseline scores were not the lowest of the three phases. Three students performed best after using the GOs on the iPad, while the other two students performed best after using the traditional paper GOs. Table 2 reveals a summary of the percentage scores that the five participants earned on the comprehension quizzes.

Andrew's percentage scores on the comprehension quizzes are represented in Figure 1. Andrew scored an average of 43% on the three quizzes in the baseline. He scored an average of 59% on the five quizzes during the first intervention. During the second intervention, he scored an average of 47% on the five quizzes. This data shows that Andrew's quiz scores increased slightly (+4%) from the baseline phase to the second intervention. However, his highest quiz scores were achieved during the first intervention period, which shows that he performed best on the quizzes after using a traditional paper GO.

Molly's percentage scores on the comprehension quizzes are represented below (see Figure 2). Molly scored an average of 47% on the three quizzes in the baseline. She scored an average of 76% on the five quizzes during the first intervention. During the second intervention, she scored an average of 80% on the five quizzes. The data shows a major increase (+33%) in Molly's quiz scores from the baseline phase to the second intervention. Her scores also increased 4% from the first intervention to the second, so it is evident that she performed best

after using the GO on the iPad.

Albert's percentage scores on the comprehension quizzes are represented in Figure 3. Albert scored an average of 40% on the three quizzes in the baseline. He scored an average of 72% on the five quizzes during the first intervention. During the second intervention, he scored an average of 80% on the five quizzes. Similarly to Molly, the data shows a major increase (+40%) in Albert's quiz scores from the baseline phase to the second intervention. His scores show an 8% increase from the first intervention to the second, so it is clear that he also performed best after using the GO on the iPad.

James's percentage scores on the comprehension quizzes are represented in Figure 4. James scored an average of 47% on the three quizzes in the baseline. He scored an average of 72% on the five quizzes during the first intervention. During the second intervention, he scored an average of 56% on the five quizzes. The data shows a 9% increase in James's quiz scores from the baseline phase to the second intervention. However, his scores from the second intervention phase decreased by 16% when compared with the first intervention phase. Similarly to Andrew, James performed best on the quizzes after using the traditional papers GOs.

Nick's percentage scores on the comprehension quizzes are represented in Figure 5. Nick scored an average of 53% on the three quizzes in the baseline. He scored an average of 40% on the five quizzes during the first intervention. During the second intervention, he scored an average of 60% on the five quizzes. The data shows a 7% increase in Nick's quiz scores from the baseline phase to the second intervention. His scores on the first intervention show a 13% decrease from his baseline scores. According to the quiz results, it is evident that he performed best after using the GOs on the iPad.

After the baseline and two intervention phases of the study were completed, the participants

were required to complete a satisfaction survey. The results indicated that, on average, the participants were happy with all three phases of the study and they were satisfied with the methods used to help improve their reading comprehension skills. However, the use of paper GOs and GOs on the iPad both scored 3.4 out of 4, while the no GO method scored a 3. This indicates that the students preferred to use GOs rather than having none at all. The results also indicate that, on average, the participants were able to best understand the stories after using the GOs on the iPad, which received an average score of 3.6 out of 4. However, they were also able to understand the stories well after using no GOs and paper GOs. The paper GO method actually scored the lowest at 2.6 out of 4, while the no GO method scored a 2.8. Table 3 reveals a summary of the survey results.

Table 2

Summary of Quiz Results

Student	Baseline (%)			Intervention 1 (%)					Intervention 2 (%)				
	Quiz #1	Quiz #2	Quiz #3	Quiz #4	Quiz #5	Quiz #6	Quiz #7	Quiz #8	Quiz #9	Quiz #10	Quiz #11	Quiz #12	Quiz #13
Andrew	50	30	50	60	83	70	42	42	60	40	25	58	50
Molly	40	80	20	80	100	80	60	60	100	80	100	20	100
Albert	20	60	40	80	80	60	80	60	20	100	80	100	100
James	40	40	60	80	40	80	80	80	40	80	80	60	20
Nick	60	40	60	20	40	40	80	20	60	60	60	80	40

Table 3

Summary of Survey Results

Survey Questions	Average Response Score/Explanation
How happy were you with using no graphic organizers while reading the stories?	3 out of 4 (Happy)
How happy were you with using the paper graphic organizers while reading the stories?	3.4 out of 4 (Happy)
How happy were you with using the graphic organizers on the iPad while reading the stories?	3.4 out of 4 (Happy)
How well do you feel that you understood the stories when no graphic organizers were used?	2.8 out of 4 (Well)
How well do you feel that you understood the stories when paper graphic organizers were used?	2.6 out of 4 (Well)
How well do you feel that you understood the stories when graphic organizers on the iPad were used?	3.6 out of 4 (Very Well)

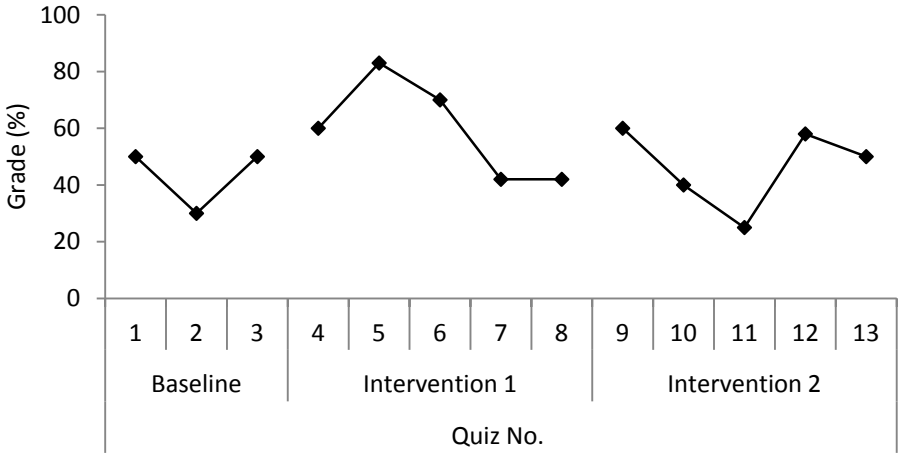

Figure 1. Andrew's Quiz Results

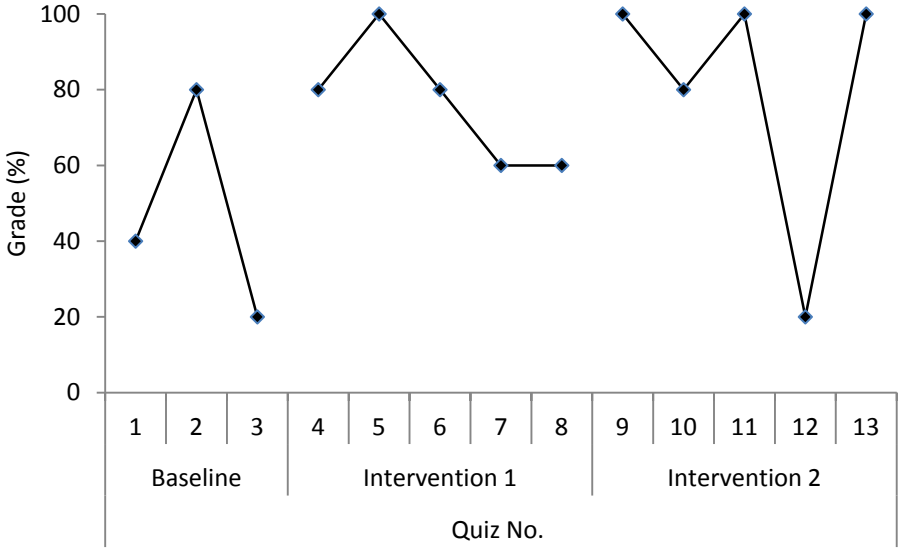

Figure 2. Molly's Quiz Results

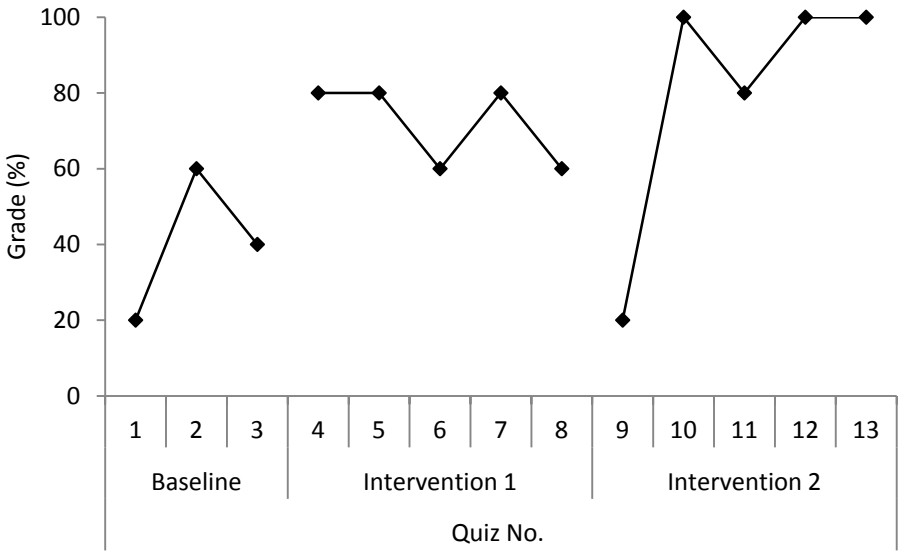

Figure 3. Albert's Quiz Results

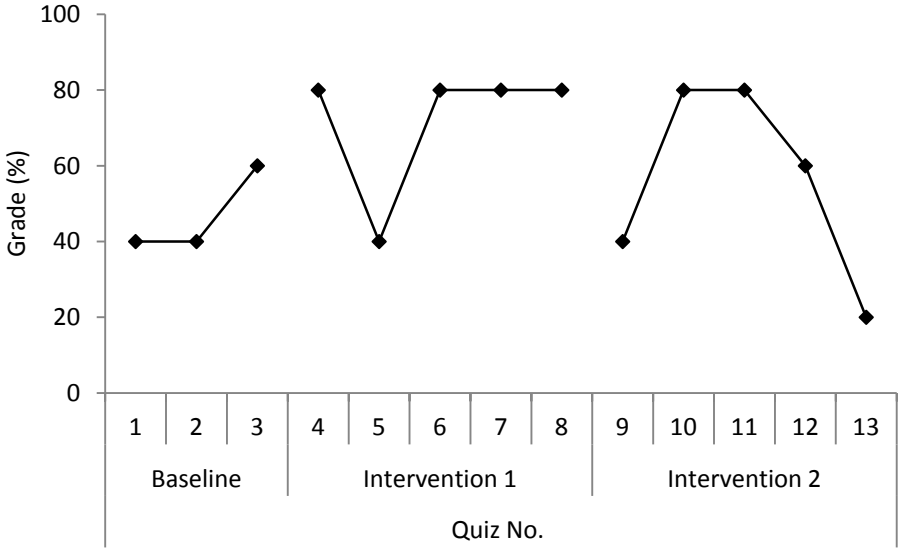

Figure 4. James's Quiz Results

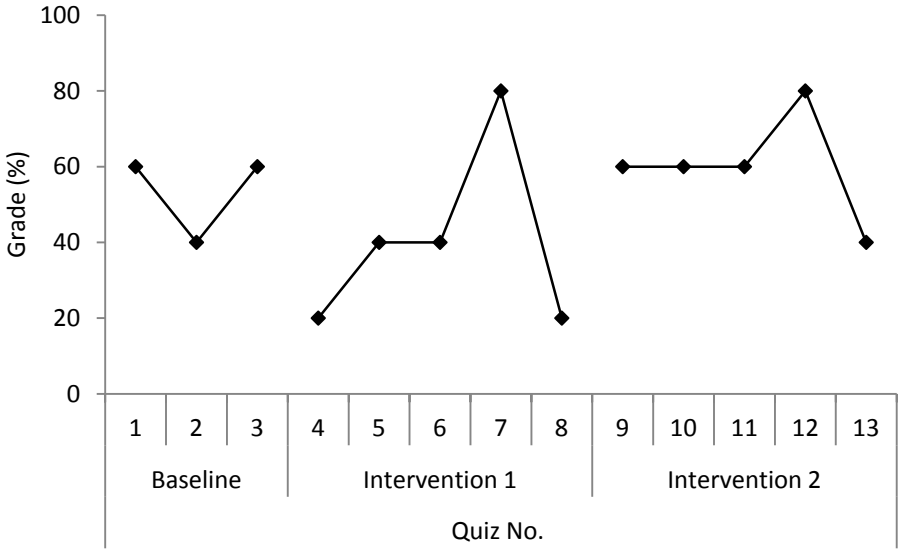

Figure 5. Nick's Quiz Results

CHAPTER 5

DISCUSSION

The present research was able to gather some evidence on the effectiveness of GOs on the reading comprehension skills of high school students with moderate to severe cognitive impairments. After reviewing the results of the study, it is evident that the five participants benefitted from using both the traditional paper GOs and the GOs on the iPad. However, it is necessary to look back at each of the participants' individual experiences throughout the course of the study and evaluate how different factors may have impacted their understanding of the stories and subsequent performance on the quizzes.

Prior to the beginning of the baseline, the students were grouped according to their reading levels. Andrew was the most proficient reader, and he was required to read stories at a third grade level. Although he was proficient at reading the stories with minimal assistance, it was somewhat surprising that Andrew performed so poorly on the majority of the quizzes. This could possibly be attributed to the fact that the stories were slightly above his reading level, and it is likely that he would have performed better on the quizzes if he was provided with stories at a lower level. There were quite a few words that he needed help pronouncing, and he was unsure of what many of the words meant.

Andrew also had a lot of difficulty understanding the nonfiction stories he was given, and he seemed to show less interest in this type of informational text. The result was lower quiz scores, thereby backing up previous research which revealed that the use of GOs has a small overall impact on students' understanding of expository text structures (e.g., Griffin & Tulbert, 1995; Moore & Readance, 1980; 1984). It is interesting to note that Andrew earned the highest average quiz scores after using the paper GOs rather than the GOs on the iPad. A reason for the

drop in scores from the first intervention to the second could be that he was distracted by or unfamiliar with the non-traditional layout of the digital GO.

The next group of students was Molly and Albert, who were required to read stories at a first grade level. Both of these students performed best on the quizzes after using the GOs on the iPad, and they seemed to be very engaged and interested in using the digital GOs. It was clear that the self-paced, individualized format of the GO on the iPad was beneficial for both Molly and Albert, which extends previous research (e.g., Raggi & Chronis, 2006). When looking at their quiz results, it is interesting to point out that both of them scored a 20% on one of the quizzes in the second intervention period even though the rest of their quiz results during this period were 80% and above. Molly received her low score on a story called *To the Store*, which is about a girl who goes to different stores to buy things. The other only other 20% score that Molly received was on a story called *Dollars and Cents*, which was covered during the baseline period. It could be possible that Molly does not have a strong understanding of money concepts, which is why her lowest scores occurred after reading these two stories. Overall, Molly performed well on the majority of the quizzes.

Albert also performed very well overall and his only 20% scores occurred on the first quiz of the baseline period and the first quiz of the second intervention period. His poor performance on the very first quiz could be explained by his unfamiliarity of the stories that he was required to read. As far as his 20% score on the first quiz of the second intervention period, he could have been distracted by or unfamiliar with the digital GO on the iPad, similarly to Andrew. However, he quickly adjusted to it and performed much better on the remaining four quizzes.

The final group of participants was James and Nick, who were both unable to read the stories on their own. They were given very simplistic stories at a kindergarten reading level.

Since they have very limited verbal and functional abilities, it was difficult to assess their reading comprehension. The results indicated that there were no significant differences between the conditions (i.e., with and without the GOs) for James and Nick. Therefore the use of text-based GOs with very low functioning students may not always be beneficial. Those students' instructional implications could be emphasized on functional daily living activities (e.g., washing dishes) and self-care skills (e.g., shaving) instead of academically driven exercises.

It is also possible that James and Nick would have benefitted more from using pictorial GOs similar to those used by Douglas and his colleagues (2011) who reported the effectiveness of using pictorial, rather than text-based GOs for three students with moderate intellectual disabilities in order to more accurately assess their understanding of the stories. The participants in the in the Douglas et al. (2011) study were very early readers with limited vocabulary skills, so the basic layout of the pictorial GOs was easy for them to understand.

After performing the current study, it is evident that students with moderate to severe cognitive impairments can improve their reading comprehension skills through the use of GOs. However, this study has some limitations that will make it necessary for future research to be done in order to validate and extend the present research. First, the small sample size of five participants provided the researcher with a limited amount of data to review, and the results would gain more credibility with a larger number of participants. Next, the limited time frame that was given to complete the data collection could have been a factor on some of the low quiz scores that the participants received. If the students had been given an extra day or two to review each story and corresponding GOs, it is likely that the average quiz scores would have been higher. An ideal time frame for the study would have been thirteen weeks, which would have given the students one week with each story. Another limitation was the fact that even though

the tutoring sessions offered one-to-one intervention from which the students most likely benefitted (Nowacek & Mamlin, 2007; Raggi & Chronis, 2006), there were environmental distractions (e.g., engagement activities during the tutoring sessions) that might have caused lower quiz scores. The final limitation was the participants' unfamiliarity with the stories and digital GOs that they were required to use. This lack of experience may have resulted in lower quiz scores during the baseline because they were not yet used to the structure of the stories and quizzes. The lack of familiarity with the digital GO may have resulted in lower quiz scores during the second intervention period as well.

The use of the iPad made a difference for the participants because it held their attention and acted as a mediator during the intervention (Raggi & Chronis, 2006), thereby resulting in improved comprehension of the stories. The interactive touch screen capability of the iPad required the students to use extra modalities such as visual and tactile/kinesthetic (McClanahan et al., 2012), which may have helped them to be more engaged and motivated to perform well on the activity.

In the future, it would be beneficial for researchers to incorporate other types of technology (e.g., interactive whiteboards) to increase students' engagement and enhance their performance. In addition, future studies with students who are nonverbal should make use of pictorial rather than text-based GOs such as those used in Douglas et al. (2011). This may allow researchers to better assess these students' true understanding of the material. All in all, this study provides some good evidence that GOs have the potential of improving the reading comprehension skills of students with cognitive impairments, but it is unclear as to whether or not digital GOs are more effective than traditional paper GOs. More research is needed in order to validate the findings.

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Name _____ Date _____

Story Map 1

Write notes in each section.

Setting: **Time:** **Place:**

Characters:

Problem:

Plot/Events:

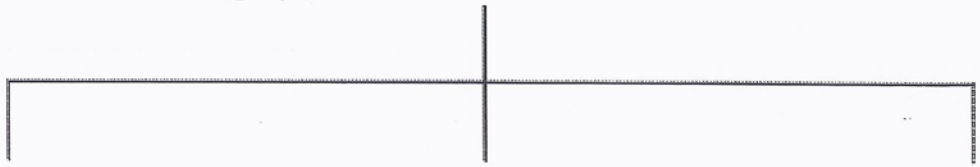
Resolution:

Name _____ Date _____

Idea Rake

Write your big topic at the top. Then Write three smaller parts of that topic below it. Choose one small part to write about.

Big Topic:



Parts:

Name _____ Date _____

Story Map 1

Write notes in each section.

Harold the dummy

Setting: **Time:** **Place:** school

shopping market town
Her house car Hotel

Characters:

Mom Harold TV Reporters
Ermaline Alice McDuff Mayor

Problem:

staying safe from strangers

Plot/Events:

making a Dummy to look like a real person

Harold startled a robber who broke into their car.

Resolution:

Harold became a hero

Name _____ Date _____

Idea Rake

Write your big topic at the top. Then Write three smaller parts of that topic below it. Choose one small part to write about.

Big Topic: Ermaline's mom wanted to be safe, but Ermaline got embarassed by the dummy

Parts:

Ermaline's mom decides to make a dummy to Protect them.

Ermaline got embarassed in the car with Harold.

Harold kept them safe From a Robber.

Name ____________________ Date ____________

Story Map 1

Write notes in each section.

Setting: **Time:** **Place:**

Home Daytime

Characters:

Me - Dad

Problem:

Saving Money

Plot/Events:

I put money in the piggy bank

Resolution:

I will save money

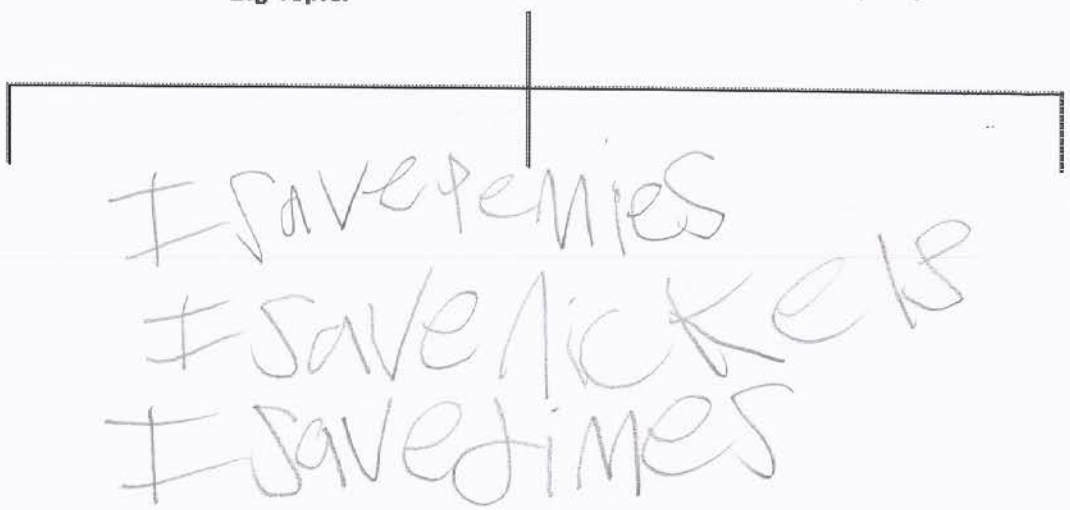
Name _____ Date _____

Idea Rake

Write your big topic at the top. Then Write three smaller parts of that topic below it. Choose one small part to write about.

Big Topic: I save money

Parts:



Name _____ Date _____

Story Map 1

Write notes in each section.

Set the Table

Setting: Dining Room **Time:** Dinner time **Place:** Home

Characters:
Boy

Problem:
where to put everything that belongs on the table for dinner

Plot/Events:
learn how to set the table appropriately

Resolution:
learning to set the table the right way.

Name _____ Date _____

Idea Rake

Write your big topic at the top. Then Write three smaller parts of that topic below it. Choose one small part to write about.

Setting the Table

Big Topic:

Parts:

put the table cloth on.	Put the dish on table.
Put utensils on table	

Name _____ Date _____

Story Map 1

Write notes in each section. Senses

Setting: **Time:** **Place:**

Outside in a garden. Daytime

Characters:

Girl, bird, bee, caterpillar

Problem:

You need to use your senses to do things.

Plot/Events:

the girl uses her five senses.

to see, hear, smell touch and taste.

Resolution:

the girl learns a lot from her senses.

Name _____ Date _____

Idea Rake

Write your big topic at the top. Then Write three smaller parts of that topic below it. Choose one small part to write about.

Big Topic: Using Your Five Senses.

Parts:

1. She uses her eyes to see.
2. She uses her ears to hear.
3. She uses her nose to smell.

Name _____ Date _____

Story Map 1

Write notes in each section.

Setting: **Time:** **Place:**

outside, day, backyard

Characters:

boy and a Frog

Problem:

the frog is hungry.

Plot/Events:

the frog tries different foods.

Resolution:

the frog finds a bug to eat.

Name _____ Date _____

Idea Rake

Write your big topic at the top. Then Write three smaller parts of that topic below it. Choose one small part to write about.

Big Topic: a hungry frog looks for foods to eat.

Parts:

1 first he tries a flower.

2 then he tries a stick.

3 last he eats a fly.

83%

Reading a-z Leveled Reader Quick Check

Level S
Harold the Dummy

Name _____ Date 2/14/14

Directions: Read each question carefully and choose the best answer.

1. Why did Ermaline dislike her name?

- (a) It was too long.
- (b) She couldn't spell it.
- (c) Kids teased her about it.
- (d) It reminded her of someone she doesn't like.

2. Why didn't Mom make legs for the dummy?

- (a) He couldn't walk anyway.
- (b) Mom didn't have the parts.
- (c) No one would see the lower parts of his body.
- (d) Someone else was going to make them for Mom.

3. Why did Ermaline suggest her Mom "bury the dummy in the backyard for a few years"?

- (a) So it would be the right color.
- (b) So she wouldn't have to ride with it.
- (c) So they wouldn't have to do any more work.
- (d) all of the above

4. What can you tell about Ermaline's mother?

- (a) She is unhappy.
- (b) She is creative.
- (c) She ignores Ermaline.
- (d) She likes to embarrass Ermaline.

5. What is a **fanatic**?

- (a) a smart person
- (b) a person with extreme views
- (c) someone with a sense of humor
- (d) someone who likes things in order

6. What caused Ermaline to whine and beg?

- (a) Her mom put ears on the dummy.
- (b) Ermaline wanted to build the dummy herself.
- (c) Her mom was going to put the dummy in the car.
- (d) Her mom was going to take Ermaline on a long trip.

Leveled Reader Quick Check continued on following page

Name _____ Date _____

Directions: Read each question carefully and choose the best answer.

7. Why did Ermaline go out to swing in the backyard?

- (a) She wanted to play.
- (b) Her friends came over.
- (c) Her mom was done making the dummy.
- (d) She couldn't stand watching her mom make the dummy.

8. Why did Mom make the dummy look like a football player?

- (a) So he would look strong.
- (b) So he would look big and scary.
- (c) So people wouldn't want to mess with him.
- (d) all the above

9. What does **unconscious** mean?

- (a) not awake
- (b) awake
- (c) surprised
- (d) threatening

10. What did Ermaline do so no one would recognize her in her Mom's car?

- (a) hid from view
- (b) put on a big wig
- (c) wore sunglasses and a hat
- (d) all the above

11. How did Ermaline and her mom feel when they opened the door and saw the police officer holding Harold?

- (a) angry
- (b) happy
- (c) surprised
- (d) disappointed

12. How can you tell Ermaline had changed her mind about the dummy at the end of the story?

- (a) She was happy to have the mayor and TV reporter at her house.
- (b) She considered putting Harold in the front seat so people could see him better.
- (c) She got ready to go for the trip and fixed Harold up so he was ready too.
- (d) all of the above

13. Extended Response: Write a brief summary of this story.

14. Extended Response: What is one precaution that you or your family have taken to make sure everyone stays safe?

60%

Reading a-z

LEVEL D

Quick Check

Senses

Name _____ Date 2/21/14

1. Why are senses important?
   - (a) Senses help people grow a garden.
   - (b) Senses help people learn about the world around them.
   - (c) Senses help people find animals for pets.

2. Where does the story take place?
   - (a) in a garden
   - (b) in a house
   - (c) in a zoo

3. Which senses would the girl NOT use with a flower?
   - (a) touch
   - (b) sight
   - (c) taste

4. How can you tell that the girl likes the berries?
   - (a) Everybody likes berries.
   - (b) It says so in the story.
   - (c) The girl is smiling.

5. What word means *to find out the flavor of something by putting it in your mouth*?
   - (a) touch
   - (b) smell
   - (c) taste

6. **Extended Response:** Have the student draw one thing he or she likes to see, hear, smell, touch, and taste (one thing for each sense). Have the student label the appropriate sense on each drawing.

Instructions: Sit next to the student and read the first question as you run your finger under the words. Ask the student to wait to answer until you have read all the choices. Repeat them if necessary. Have the student choose the best answer. Repeat with the remaining questions.

Reading a-z

80%

LEVEL D

Quick Check

Frog Is Hungry

Name _____ Date 2/11/14

1. Where does most of the story take place?
   - (a) in a yard
   - (b) in a house
   - (c) in a pond

2. What does the boy do after he feeds Frog?
   - (a) He plays a game with Frog.
   - (b) He takes Frog outside.
   - (c) He puts Frog in the tank.

3. How does Frog feel after he eats the flower?
   - (a) mad
   - (b) scared
   - (c) hungry

4. How does Frog solve his problem?
   - (a) He eats a fly.
   - (b) He hops home.
   - (c) He goes to the store.

5. Which word means the opposite of **hungry**?
   - (a) empty
   - (b) full
   - (c) happy

6. **Extended Response:** Have the student dictate (or write) what Frog's problem was in this story.

Instructions: Sit next to the student and read the first question as you run your finger under the words. Ask the student to wait to answer until you have read all the choices. Repeat them if necessary. Have the student choose the best answer. Repeat with the remaining questions.

80%

Reading a-z

LEVEL A

Quick Check

The Forest

Name _____ Date 3/5/14

1. A tree belongs to which group?

   Ⓐ plants Ⓑ animals

2. The forest is the _____ of this story.

   Ⓐ main character Ⓑ setting

3. Which animal lives in a forest?

   Ⓐ a whale Ⓑ a fox

4. _____ are found in a forest.

   Ⓐ Trees Ⓑ Gardens

5. _____ is made of water and is smaller than a river.

   Ⓐ A stream Ⓑ A forest

Instructions: Sit next to the student and read the first question as you run your finger under the words. Ask the student to wait to answer until you have read all the choices. Repeat them if necessary. Have the student choose the best answer. Repeat with the remaining questions.

Reading a-z

60%

LEVEL A

Quick Check

These Shoes

Name _____ Date 3/7/14

1. What is the main idea of this book?

   Ⓐ Shoes are important to wear.

   Ⓑ There are many types of shoes.

2. How are all the shoes in this book the same?

   Ⓐ They all are funny.

   Ⓑ They all are worn on the feet.

3. How are the tall shoes different from the shiny shoes?

   Ⓐ They are too big.

   Ⓑ They cover the legs and feet.

4. What is one way that the pairs of funny shoes are different?

   Ⓐ One pair has eyes and the other pair does not have eyes.

   Ⓑ One pair is green and the other pair is brown.

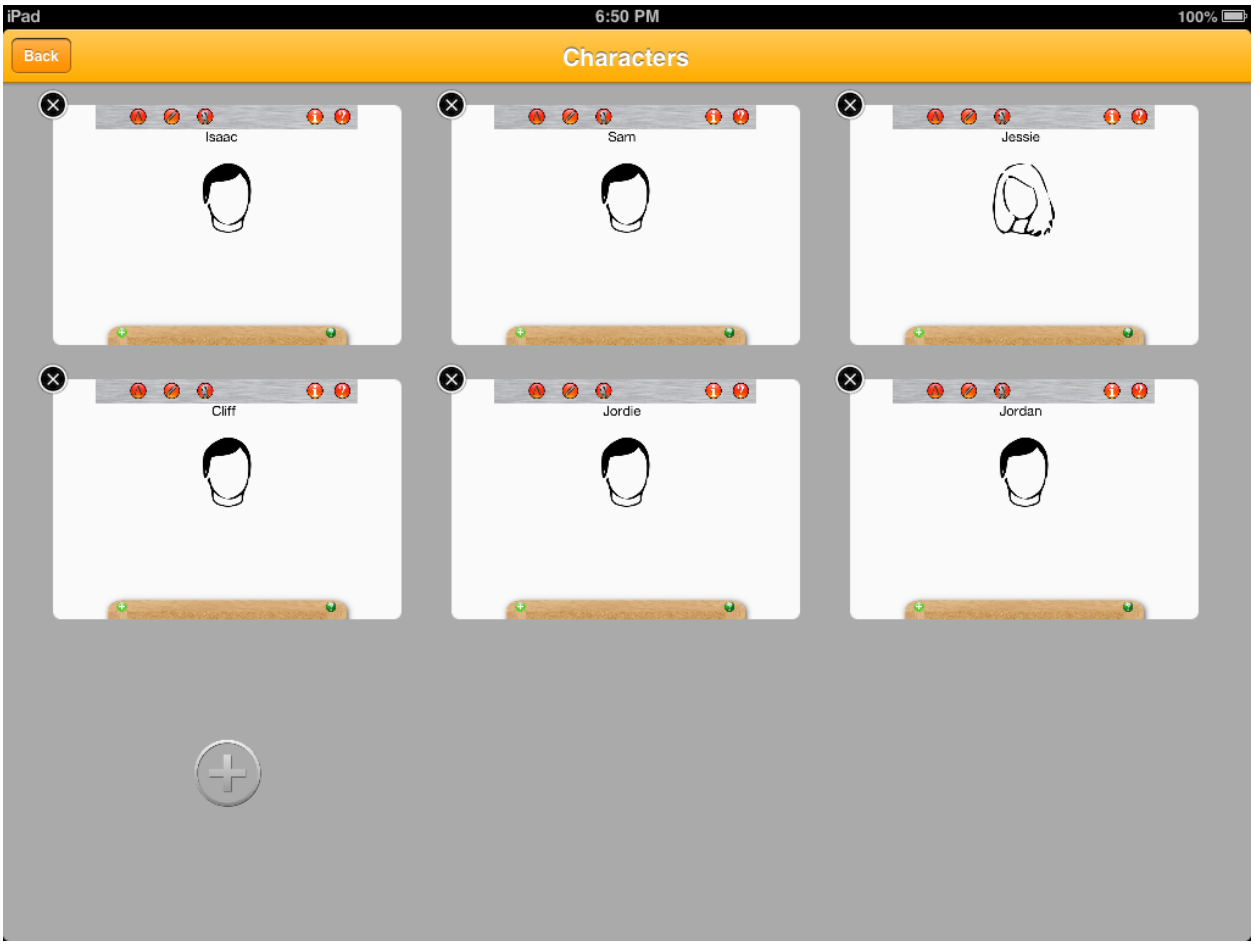
5. Listen to this sentence: *That dog looks as **big** as a horse.* Another word for **big** is _____.

   Ⓐ large

   Ⓑ small

Instructions: Sit next to the student and read the first question as you run your finger under the words. Ask the student to wait to answer until you have read all the choices. Repeat them if necessary. Have the student choose the best answer. Repeat with the remaining questions.

Image: © Jupiterimages Corp. (plane); © iStockphoto.com/ynamaku (train)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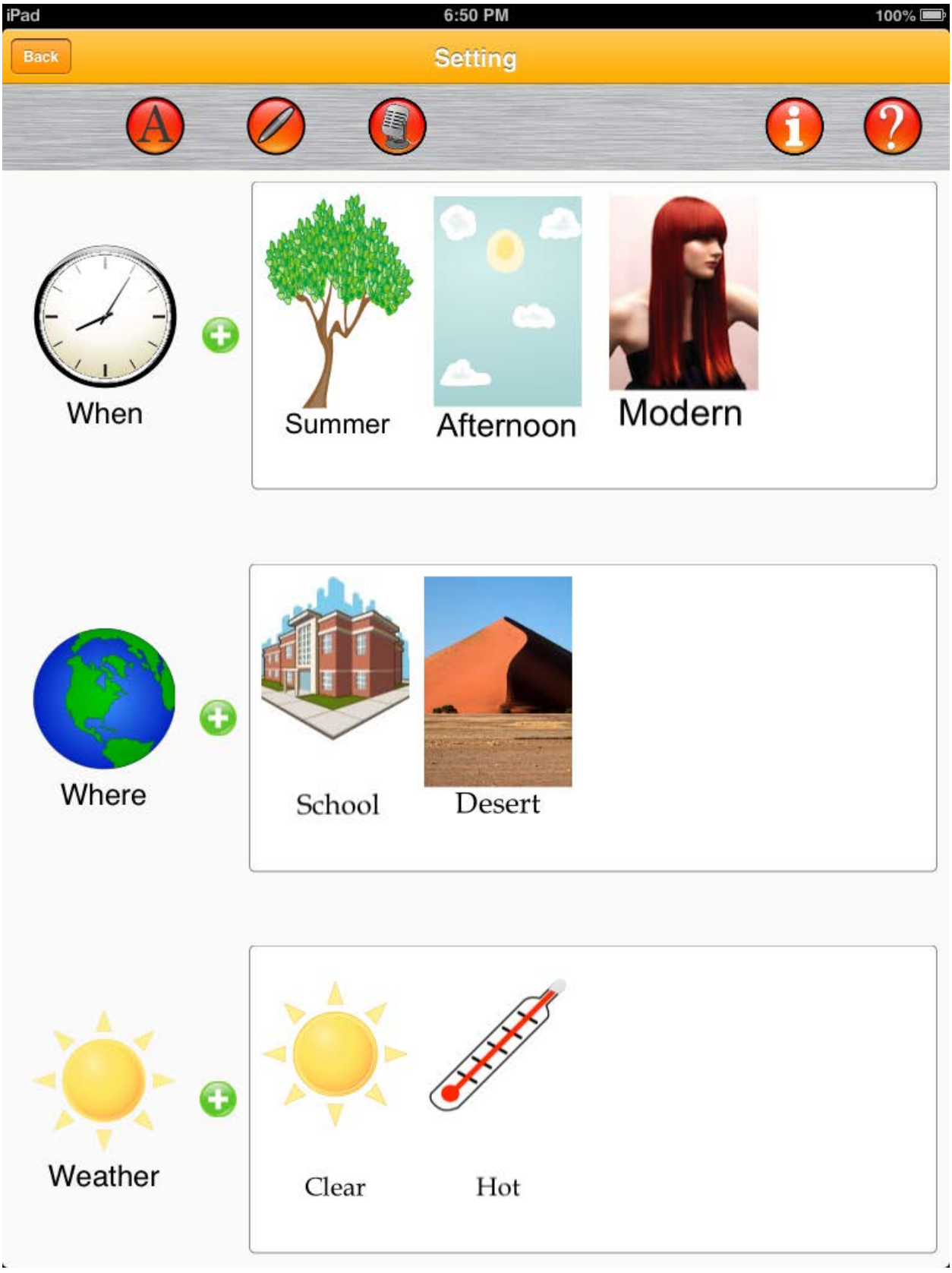
Back
Characters
Isaac
Sam
Jessie
Cliff
Jordie
Jordan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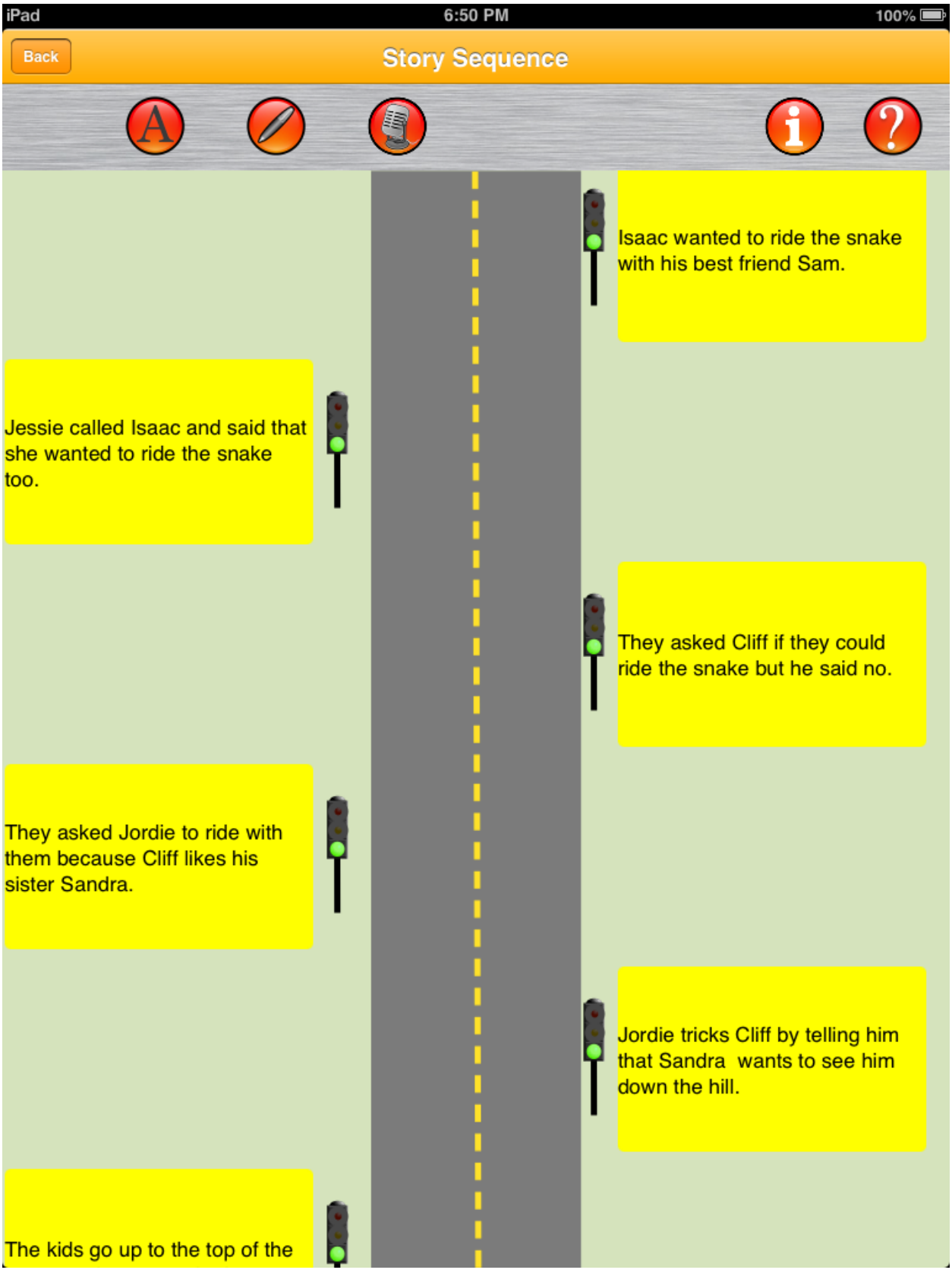
Setting
When
Summer
Afternoon
Modern
Where
School
Desert
Weather
Clear
Hot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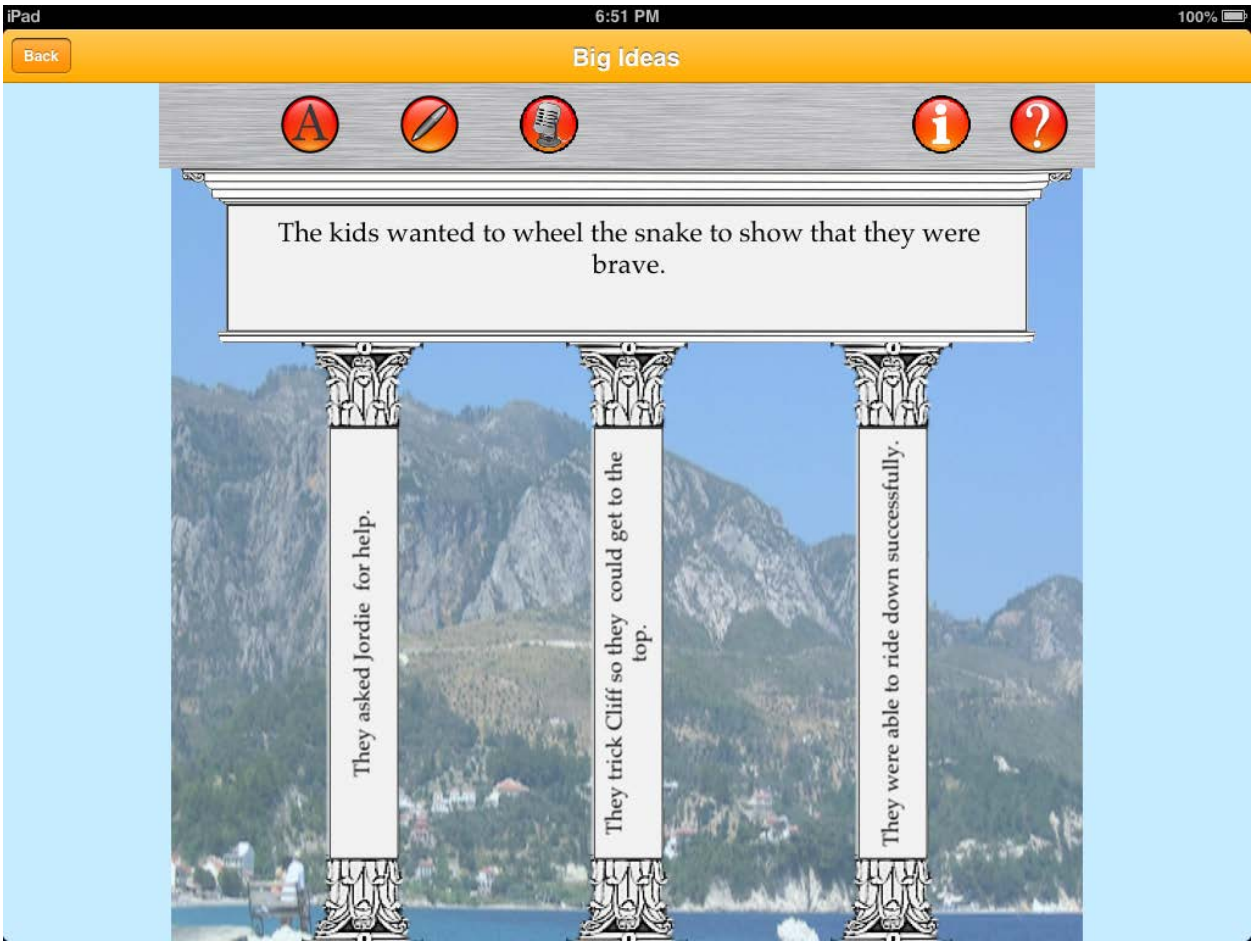
Story Sequence
Isaac wanted to ride the snake with his best friend Sam.
Jessie called Isaac and said that she wanted to ride the snake too.
They asked Cliff if they could ride the snake but he said no.
They asked Jordie to ride with them because Cliff likes his sister Sandra.
Jordie tricks Cliff by telling him that Sandra wants to see him down the hill.
The kids go up to the top of the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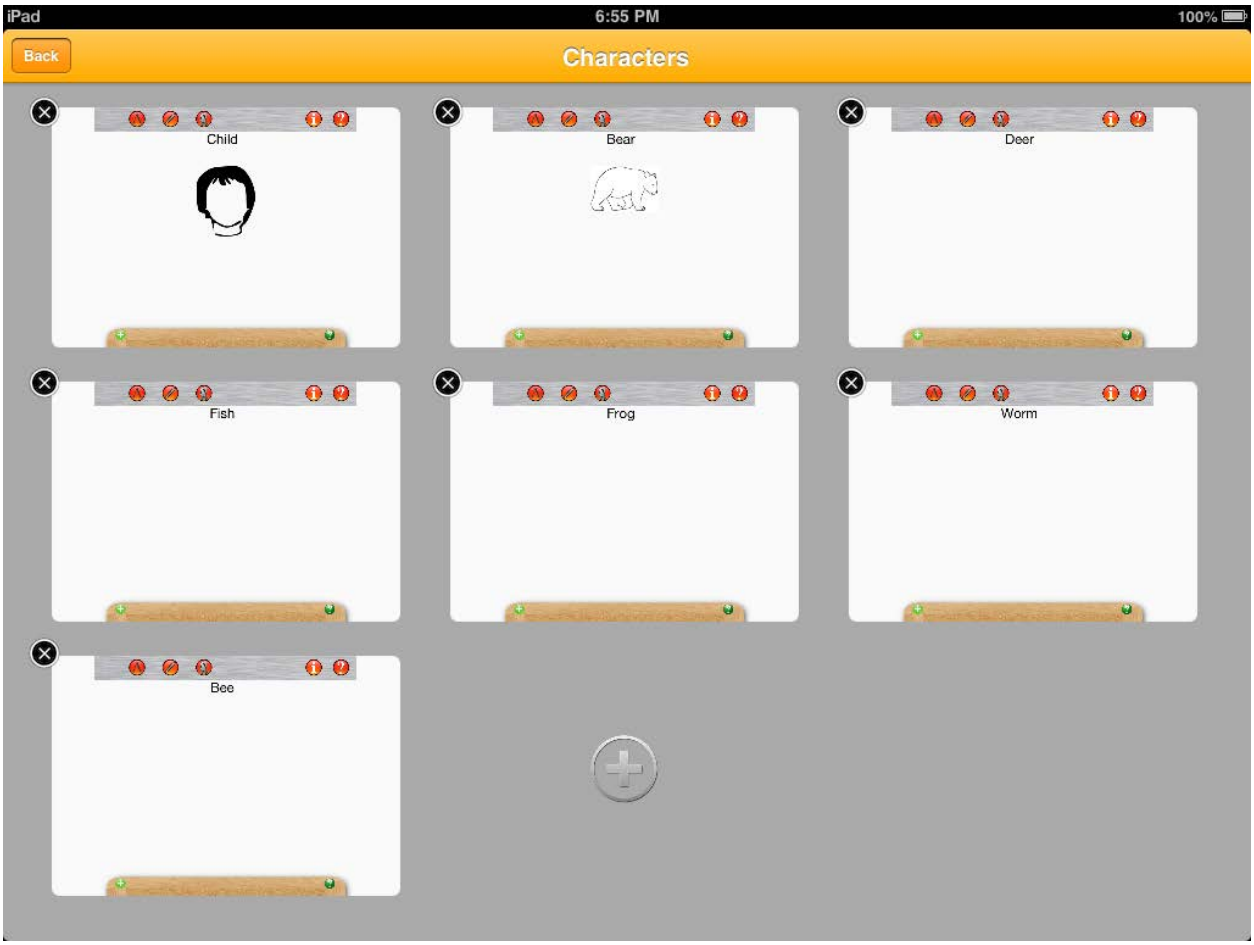
Back
Big Ideas
The kids wanted to wheel the snake to show that they were brave.
They asked Jordie for help.
They trick Cliff so they could get to the top.
They were able to ride down successfully.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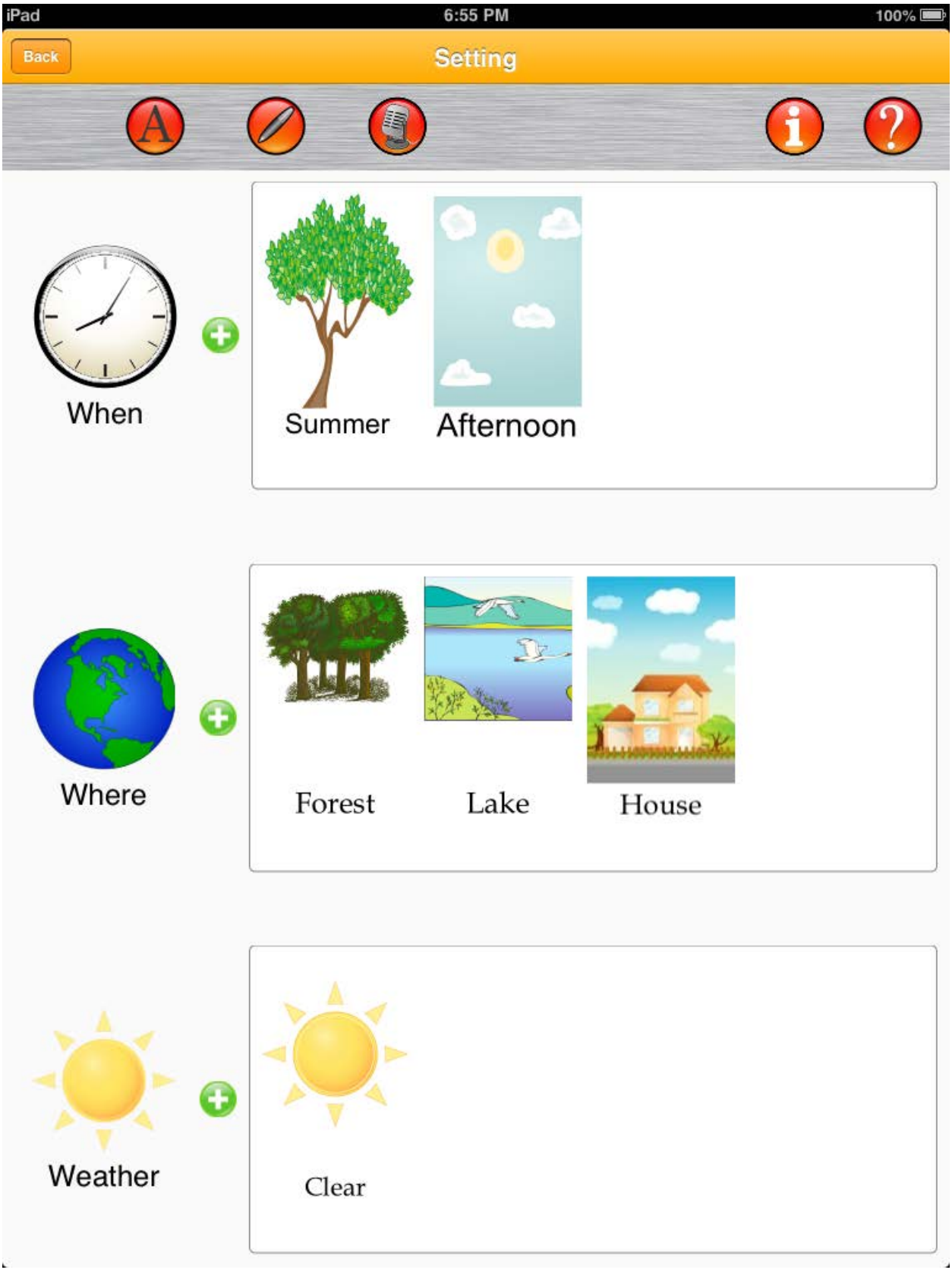
Back
Characters
Child
Bear
Deer
Fish
Frog
Worm
Bee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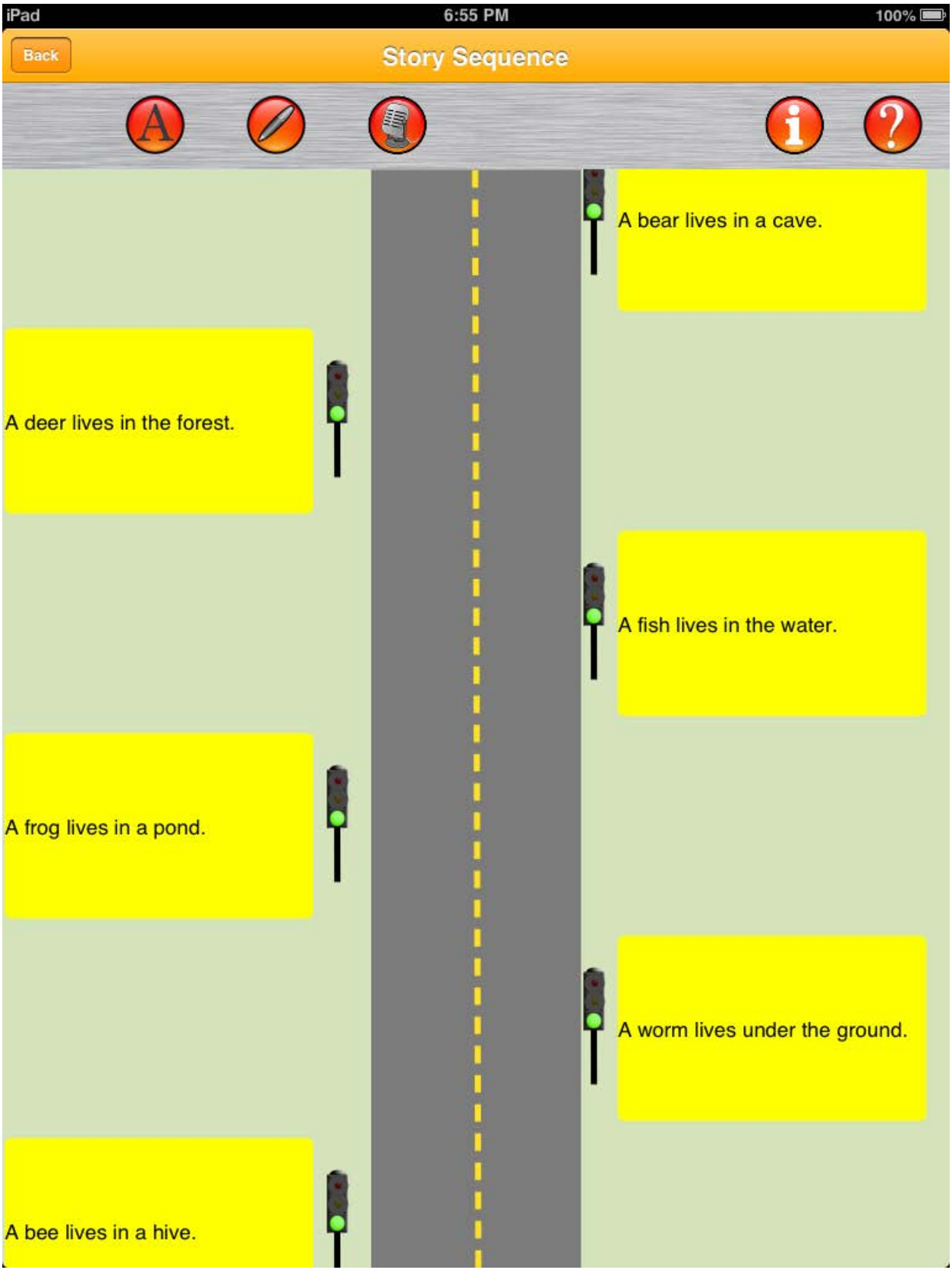
Back
Setting
When
Summer
Afternoon
Where
Forest
Lake
House
Weather
Clear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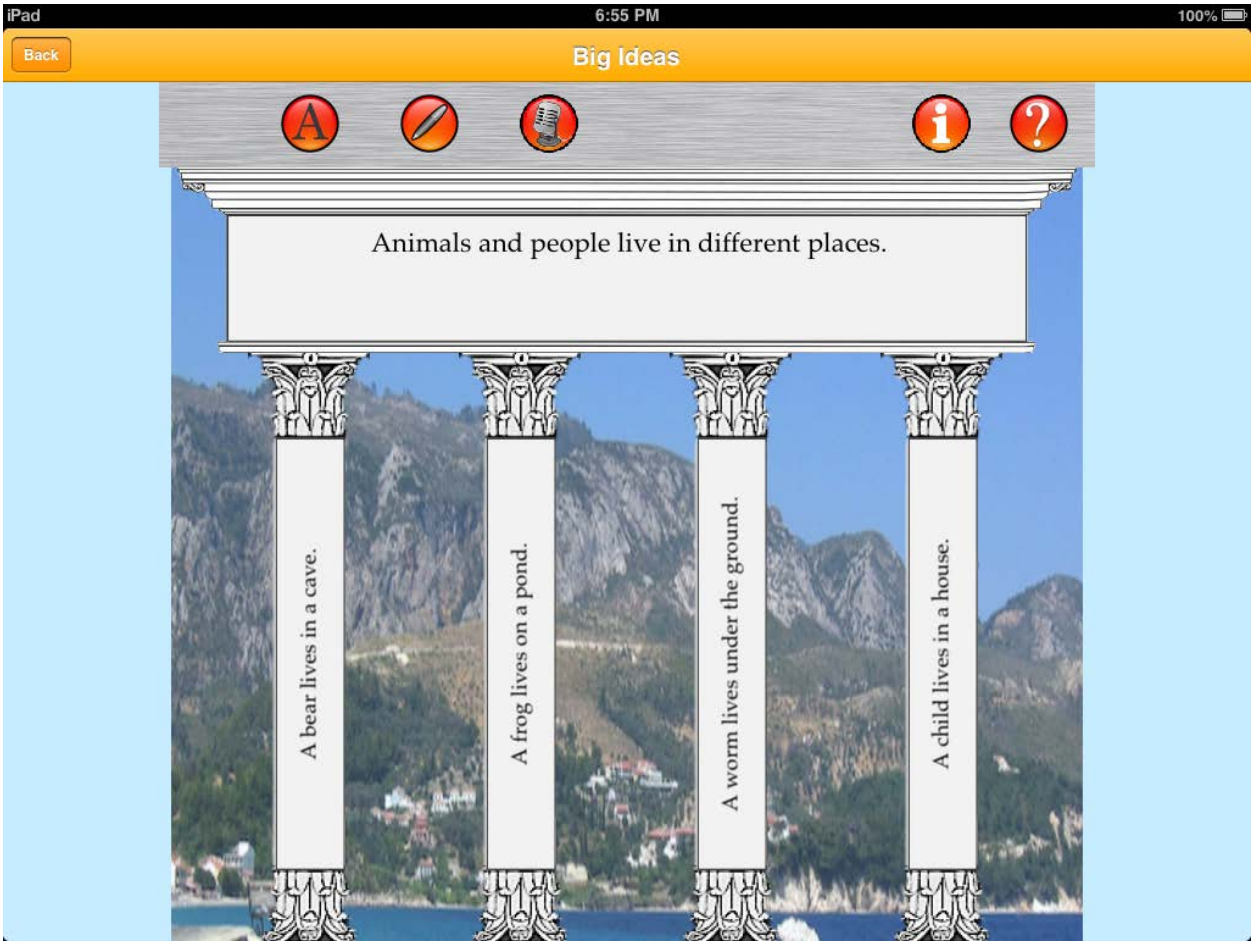
Story Sequence
A bear lives in a cave.
A deer lives in the forest.
A fish lives in the water.
A frog lives in a pond.
A worm lives under the ground.
A bee lives in a hive.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Back
Big Ideas
Animals and people live in different places.
A bear lives in a cave.
A frog lives on a pond.
A worm lives under the ground.
A child lives in a house.

Name:_____ **Date:_____**

Student Satisfaction Survey

1 = Very Unhappy **2 = Unhappy** **3 = Happy** **4 = Very Happy**

How happy were you with using no graphic organizers while reading the stories?

1 **2** **3** **4**

How happy were you with using the paper graphic organizers while reading the stories?

1 **2** **3** **4**

How happy were you with using the graphic organizers on the iPad while reading the stories?

1 **2** **3** **4**

1 = Not Well At All **2 = Somewhat Well** **3 = Well** **4 = Very Well**

How well do you feel that you understood the stories when no graphic organizers were used?

1 **2** **3** **4**

How well do you feel that you understood the stories when paper graphic organizers were used?

1 **2** **3** **4**

How well do you feel that you understood the stories when graphic organizers on the iPad were used?

1 **2** **3** **4**