Action Research Report: Using Objects to Increase Reading Comprehension in Students with Significant Cognitive Disabilities

Sheila Bravo

Abstract

The purpose of this action research was to facilitate reading comprehension of read-alouds in students with the most significant cognitive disabilities. Grade-level read-alouds were paired with manipulatives (real objects) that represented the stories read. Students were assessed after reading, and the results between instances when manipulatives were used, were compared to instances when pictures were used. All students participating in the study demonstrated an increased level in comprehension of the texts shown by answering more questions correctly when manipulatives were used.

Action Research Report: Using Objects to Increase Reading Comprehension in Students with Significant Cognitive Disabilities

Significance and Statement of Problem

Students with the most significant cognitive disabilities can be described following the criteria provided by Browder and Spooner (2006) as students who require significant support, adaptations and/or modifications to be able to access content at grade level, students requiring intensive instruction to acquire and generalize knowledge, and students who have alternative achievement standards for grade level content.

Due to the extent of their delays, historically students with significant cognitive disabilities were excluded from the general education curriculum and their instruction focused primarily in helping them gain access to daily living and functional skills rather than academic skills. Since the implementation of the Individuals with Disabilities Education Act (IDEA, 1997), which requires that students with disabilities participate and progress in the general curriculum and No Child Left Behind (NCLB, 2001), which requires schools to show progress of students and schools, including students with disabilities, there has been a change in the access that students with the most significant cognitive disabilities have to the academic curriculum.

Usually, students with the most significant cognitive disabilities need considerable modifications to access the general education since they are not able to work at the same level as nondisabled students. They may make progress but expectations are considerably below grade level and are reflected in the students' Individual Educational Plans (IEP). They usually have different curriculum goals and are assessed using alternate statewide assessments to measure their progress. Instruction has to be differentiated to allow each student to access the curriculum according to his/her ability level.

Currently, students with disabilities receive instruction in all areas of the general education curriculum, including literacy. Several researchers have established that students with the most

significant cognitive disabilities benefit from receiving instruction in literacy. (Kliewer & Biklin (2001); Ryndak, Morrison, & Sommerstein (1999). Among the advantages of literacy instruction are increasing attention, social interaction, and improvement in expressive and receptive communication skills, among others.

Teaching literacy to students with significant cognitive disabilities has several goals, with comprehension of the materials read being one of the most important. To achieve the goal of teaching literacy and other subject areas to students with significant cognitive disabilities, curriculums targeting this population have been developed, which provide access to the general education curriculum using a variety of modifications, accommodations, augmentative means of communication, etc. and are in alignment with the Common Core Standards. The advantage of these curriculums is that instruction is differentiated to meet the educational needs and cognitive abilities of each student. One such a curriculum is Unique Learning System, which uses adaptations and accommodations to allow students to access the curriculum, such as picture support to facilitate comprehension, switches and communication devices, among others.

Although these curriculums for students with significant cognitive disabilities provide better opportunities to master the concepts introduced to them, such as providing picture support to facilitate comprehension, in some cases this may not be enough, requiring other strategies, like the use of manipulatives or concrete objects to help students understand the concepts being taught.

The purpose of the present study is to pair read aloud texts with manipulatives (real objects) that represent the stories read to measure if the use of concrete objects increases comprehension skills of students with significant intellectual disabilities.

Literature Review

The present review will explore current experimental studies regarding strategies used to increase reading comprehension with students with significant cognitive disabilities. After a discussion of the characteristics of students with significant cognitive disabilities and how these characteristics connect to reading instruction, the review will explore the use of read-aloud strategies for teaching literacy to students with significant cognitive disabilities. Second, it will explore the use of real objects in teaching.

Characteristics of Students with Significant Cognitive Disabilities

There is consensus in the educational community about the importance of teaching academic skills to all students, including students with significant cognitive disabilities.

Browder et al. (2007) provide four reasons to promote grade-level academic content for students with significant disabilities. First, schools should help promote competent adults. Second, there is a historic tendency that has been developing to expect better performance for students with disabilities. Third, students with disabilities should have access to equal opportunities regarding education. Fourth, teaching grade-level academic skills increases self-determination skills for students with disabilities

In the past, the instruction of this population of students focused primarily on learning functional skills, but since IDEA and No Child Left Behind, students with the most significant cognitive disabilities receive instruction in all areas of the general education curriculum. To be able to access the general education curriculum these students need major adaptations and accommodations to make the materials accessible. With this objective, states have developed alternate academic standards align with grade level curriculums. Students access the curriculum through what is called access points, which provides three levels of access to the curriculum: participatory, supported and independent, going from least to most complex. Students with the most significant cognitive disabilities will vary in the level of participation they can achieve. Regardless of their degree of participation, all levels are aligned following grade-level materials and expectations.

Federal regulations require students with the most significant cognitive disabilities to be assessed and to show progress. Students, who access the curriculum through access points are usually in a modified curriculum track, will receive a special diploma and are evaluated using alternate assessments which are based in alternate achievement standards. The IEP team decides on an individual basis if the student will be working on access points and will participate in alternate assessment.

Teaching students with significant cognitive disabilities has substantial challenges. One such a challenge is the fact that this population of students has different communication styles: augmentative communication devices, eye gaze, and facial expressions, among others. To understand their differences in communication styles and their use of symbols and to be able to link this to academic instruction, it is pertinent to rely on the explanation that Browder, et al. (2007) provide regarding levels of access to symbols. According to these authors, there are three different levels of access to symbols in students with disabilities: Symbolic (abstract), early symbolic (concrete) and presymbolic (awareness). The Symbolic level refers to the use of symbols in an abstract way; for example, students functioning at this level may use communication devices to select responses among a wide range of options. Students at this level may be nonverbal, but may be able to handle a vast repertoire of symbols. At this level, even those students who are non-verbal may be able to recognize symbolic systems such as sight words and numbers.

Students functioning at the concrete level or early symbolic level may have only a few symbols available to communicate. Students may be at a level where they have to be taught to match objects with their pictures; they may be able to use these pictures to make requests. At the concrete level, students required extensive instruction to be able to use symbols that represent concepts taught to them.

Students functioning at the presymbolic level do not use pictures, words, gestures or objects to communicate with others expressively. They may not have symbols available and may have limited intentionality. According to Goldstein and Behuniak (2010) students functioning in this level require that their communication efforts must be interpreted by a listener to acquire meaning. When working with students who are functioning at a presymbolic level, it is pertinent to use objects to facilitate teaching and comprehension of text.

Kleinert, Browder and Towles-Reeves (2009) found that students working at a presymbolic level make up approximately 10 % of the total population of students participating on alternate assessments. This population of students presents significant challenges to teachers who need to implement research-based strategies that can help students gain basic communication while linking instruction to grade-level curriculum.

Some researchers have been trying to find characteristics of students participating in alternate assessments. For example, Towles-Reeves, Kearns, Kleinert and Kleinert (2009) conducted a study examining the characteristics of students taking alternate assessment in three different states that differed significantly in geography as well as demographics. These researchers used a survey research design, in which they created a scale covering nine dimensions in which students with significant disabilities show great variability: social engagement, expressive and receptive communication, motor skills, vision, hearing, health, math and reading. Results showed that there are mainly two groups of students taking alternate assessments: one group is composed primarily of students who have achieved a symbolic or emergent symbolic communication level, who demonstrate social interactions and who have acquired some practical knowledge of math and reading. The second group of students (10 to 25 %) is comprised of students who have not reached a level of symbolic communication, who do not establish social interactions and who do not recognize print materials or numbers. This heterogeneity of students participating in alternate assessment makes the development of valid and reliable assessments a very challenging task.

Another study to determine the level of knowledge and skills of students participating on alternate assessments was conducted by Goldstein and Behuniak (2012). These researchers wanted to examine teachers' perceptions of the appropriateness of academic content knowledge for students with significant cognitive disabilities. These authors used a skills' checklist and focus groups of special education teachers in Connecticut. The study found that teachers categorized students with significant cognitive disabilities in two groups: a group for whom grade level content is pertinent and a group for whom it is not. For the first group, teachers also rated their communication skills as higher functioning with less use of augmentative communication devices. For the second group, the one for who teachers considered grade level content not pertinent, teachers also rated their communication skills as poor, requiring use of augmentative communication devices. Teachers considered that participation in alternate assessment is advisable for nearly half of the population participating in it, but it is unclear for the other half.

Read Alouds or Shared Stories

It is usually difficult to identify effective strategies to teach literacy to students with significant cognitive disabilities. Among the most used strategies are read-alouds or shared stories in which a proficient reader reads a story to a student who is not able to read. Plenty of interaction opportunities are provided while using read alouds. The stories used in share reading share some characteristics, such as repeated lines, words paired with pictures, attention getters, etc.

According to Knight, Browder, Agnello, and Lee (2010), the read-alouds are particularly important for students with severe disabilities since they usually need this kind of support throughout the school day and in different subject areas. There is supporting evidenced of the importance of shared reading with students with severe cognitive disabilities. Mims, Browder,

Baker, Lee, and Spooner (2009) explored different studies and found that shared stories can help to increase phonological, metalinguistic and print awareness as well as alphabet knowledge. Even though shared stories are not exclusively used in special education, when used with students with disabilities, shared stories have demonstrated an increase in literacy and communication in students with disabilities.

In reviewing the literature regarding share stories and students with significant cognitive disabilities several studies were found (e.g. Browder, Mims, Spooner, Ahlgrim & Lee, 2008; Browder, Lee & Mims, 2011; Mims, et.al.2009; Mims, Hudson & Browder, 2012; Hudson & Test, 2011; Skotko, Koppenhaver & Erickson, 2004) . One such study was conducted by Mims, et al. (2009) in which researchers used a prompt system from least to most to stimulate listening comprehension in two students with significant intellectual disabilities and visual impairments. The intervention helped students to obtained improvements in the number of correct comprehension questions answered.

Skotko, Koppenhaver and Erickson (2004) developed a study with four girls affected with Rett syndrome and their mothers. These researchers used story book interactions to increase the communication skills of the girls. The researchers noted that the girls increased their communication attempts, using different means to communicate, such as augmentative communication devices, attention to books, vocalizations, etc. The authors also observed that the mothers adjusted the reading strategies over time, for example, asking more questions or pointing to the book to capture their daughters' attention. The researchers concluded that the use of storybooks resulted in an increase in the use of meaningful ways to communication by the girls.

Another study using shared stories with students with multiple disabilities was conducted by Browder, Mims, Spooner, Ahlgrim and Lee (2008). These researchers used principles of universal design for learning (UDL) to deal with physical limitations and obtained results showing progress in literacy skills of three elementary students. Researchers used UDL principles to plan how to adapt materials, ways to respond and instructional strategies to enhance teaching opportunities. There are three components of UDL that are pertinent: a) representation can be defined as the adjustments made to classroom elements to make them accessible for the students, such as larger print or modified books; b) expression can be defined as the use of alternative methods of communication for students with limited communication skills, such as augmentative communication devices, I pads, and other devices; c) engagement can be defined as the use of alternative methods to engage students with disabilities in the learning process, such as repetition of activities, plenty of opportunities to respond, etc.

Browder, Lee and Mims (2011) conducted a study to investigate the use of shared stories for student with severe cognitive disabilities. Their sample included 3 students with significant cognitive disabilities and sensory or physical impairments. The main means of communication of the students was presymbolic: they used movement or sounds instead of pictures to communicate with others. The intervention consisted in using adapted books, voice output devices and objects to increase comprehension. The researchers also included task analysis and scripts to facilitate teacher instruction. The results of the study demonstrate that students increased engagement and comprehension.

Mims, Hudson and Browder (2012) conducted a study to evaluate the use of prompts in reading comprehension of read-alouds on students with moderate and severe disabilities. The read-alouds were grade-level biographies that had been adapted. Researchers noticed an improvement in comprehension of non-fictional texts (biographies) when combining read-alouds with prompts. Some insights that were gained through this experimental study are the fact that a first level of prompts was used to teach students how to answer WH questions ("if you hear who look for a person's name"); by teaching students what to listen for to be able to answer WH questions, some degree of generalization was achieved: when students kept reading biographies that were introduced for the first time, researchers observed that they were able to answer correctly some questions ; finally, researchers noticed that students' reading skills may had been better that what they had demonstrated in class prior to the study.

Hudson and Test (2011) reviewed the literature regarding shared stories. The studies that were included in their review had to meet the following criteria: 1) studies had to be experimental and published in a peer-reviewed publication, 2) participants had to be individuals with significant support needs, 3) the independent variables in the studies were the use of shared stories, and 4) the studies had to include at least one part of literacy as the dependent variable. These researchers found 13 studies that met the four criteria established. After reviewing the studies, the researchers found a moderate level of evidence in the literature to support the use of shared stories as evidence based practice to teach literacy to student with significant support needs.

Use of Real Objects

Most of the experimental studies mentioned in this review used objects as part of the materials to increase comprehension. Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2008) mentioned that they used sensory materials and objects to go along with the stories.

Browder, et al. (2009) wrote an article about teaching literacy to students with significant disabilities. These authors specified that students with significant disabilities "may need concrete referents such as objects for story concepts to have meaning" (p. 272).

Many studies have used real objects to increase comprehension skills in students with significant cognitive disabilities. According to Ogletree and Crawford, there are several interventions for students with significant cognitive disabilities that have used objects, such as to promote signaling, as a mean to help student's understanding, and to improve receptive and expressive communication skills and as a way to improve requesting objects.

According Mims, Browder, Baker, Lee, and Spooner (2009), to extent studies about the effectiveness of using read-alouds for students with significant cognitive disabilities and visual impairments they recommend two changes: systematic prompting and real objects. Adding real objects has the advantage of providing actual information that will increase the reader's interaction with the story and will provide an opportunity to relate to the story. Their experimental study used five concrete objects that were specified in the book used.

According to Browder, et al. (2008) to increase access to literature, students with significant cognitive disabilities benefit from being read daily and using supports to increase student

engagement. A good way to engage students is to provide objects related to the story to make meaning more accessible to the students.

Visually impaired student are not the only ones that may benefit by using real objects to increase comprehension of texts; there may be other reasons to use real objects when instructing students with significant disabilities, among them the level of access to symbols exhibit by students. Students who are functioning at a presymbolic level as described below may benefit from using objects paired with symbols and/or pictures to increase comprehension. According to Browder, et al. (2007) "depending on the student's level of symbol use, materials are adapted and instructional activities are designed to require different levels of cognitive demand" (p. 12). This will allow that students are able to access materials at grade-level.

Conclusion

The literature reviewed supports the purpose of the present study to use real objects associated with read-alouds to increase comprehension skills in students with significant cognitive disabilities. Real objects can provide a mean to represent concepts, making them more accessible and easy to understand.

Action Plan

Context

The present study took place in a medical facility called Prescribed Pediatric Extended Care (PPEC) that these students attend daily. Four students identified as InD (Intellectual Disabilities) participated in the study. Three of the students have genetic conditions and one has a Traumatic Brain Injury (TBI) due to a near drowning episode. All the students fall within the most significant intellectual disabilities range: they are non-ambulatory, non-verbal, are not able to read or write and their primary means of communication are through facial expressions and eye gaze.

The necessary tools to implement the action research included, but are not limited to, Unique Learning System curriculum and assessments and Access Points for Sunshine State Standards.

Research Questions

Will the use of manipulatives that represent stories read to the students increase comprehension of the texts?

Intervention

Read-alouds of grade-level texts were used with students with significant cognitive disabilities. Real object/s representing the stories were associated with the text and presented to the student/s while the text was being read. After reading, the students were asked comprehension questions, for example, what was the story about? Teacher presented two objects to the student/s: one object related to the story (for example an apple in a story about apples), and an unrelated object. To respond, student/s used eye gaze and/ or touch the correct object.

Data Collection

Data was collected using three sources: Unique learning System Assessment, teacher developed chart and checklist.

The first data source, Unique Learning System Assessment organizes data automatically. A comparison between correct number of questions answered at the beginning and end of the month was done to analyze if instruction with the use of objects had a positive effect over the correct number of questions answered. Unique Learning system provides a chart that displays the correct answers comparing the pre and post-test responses (see figure 1).

The second data source, the teacher developed chart, was organized using an excel data sheet created to collect and organize the data collected. Data was collected twice weekly, after story reading using picture and object support (see figure 2, appendix A).

To analyze this data source number of questions answered correctly were calculated for the reading using picture support and for the reading using object support and then the total number of correct questions answered was compared. The data was displayed using a bar chart that shows total number of correct answers for both readings.

The third data source, the checklist, was organized using a chart with desirable behaviors where the teacher checked yes or no to each desirable behavior after each story reading using picture and object support (see tables 1 through 4). To analyze the data, the teacher calculated the total number of yes and no when using picture and object support and the results were compared to determine if the students displayed a greater number of desirable behaviors when using pictures or objects. A bar chart was created to display the total number of yes and no to the desirable behaviors for both support methods.

Results

Data Analysis

The data collected for this study were analyzed using various ways. Students received a pre and posttest using a curriculum called Unique Learning System. They were asked five questions before being introduced to the materials and the answers were recorded into the program to show their previous knowledge on the subject. A posttest using the same questions of the pretest was given to the students after they have being exposed to the materials assigned to that academic unit. These data were collected at the beginning and at the end of the month. The data was displayed using a chart provided by Unique that compares the number of correct answers obtained in each attempt and shows this information in a column chart (see figure 1).

Another source of data collected was to compare the number of correct answers to comprehension questions about a text when using picture or object support. In this case, the teacher read a story weekly to the students in two occasions: the first time, picture support was used to facilitate comprehension; the second time that the story was read, real objects were used. After each reading, students were asked comprehension questions using either pictures or objects, depending on what support had been used during reading. Students provided the answers to the questions by touching or eye gazing the response, since they are all nonverbal. To analyze the data, the researcher compared how many questions were answered correctly when using picture or object support. These data were shown in a column chart that compares both approaches (see figure 2).

The third source of data used were checklists developed by the investigator that show student engagement with the activity. A list of six engagement indicators was created to determine the level of engagement with the activities and determine if students show any preference with the stories when the researcher used picture support or when objects were used. These data were collected twice a week after each reading. Each indicator of engagement was marked as yes or no; for example, the student looks at the teacher during the activity was one of the indicator of engagement and it was marked yes or no after reading using picture support the first time and object support the second time. A percentage of total positive engagement indicators was calculated by adding all the yes responses and dividing them by the total number of possible indicators; for example, if a student obtained five yes engagement indicators, he/she would obtain 86 % on engagement (Percentage= 5/6 X 100). Finally, these percentages of engagement with the activities were displayed in charts.

Findings

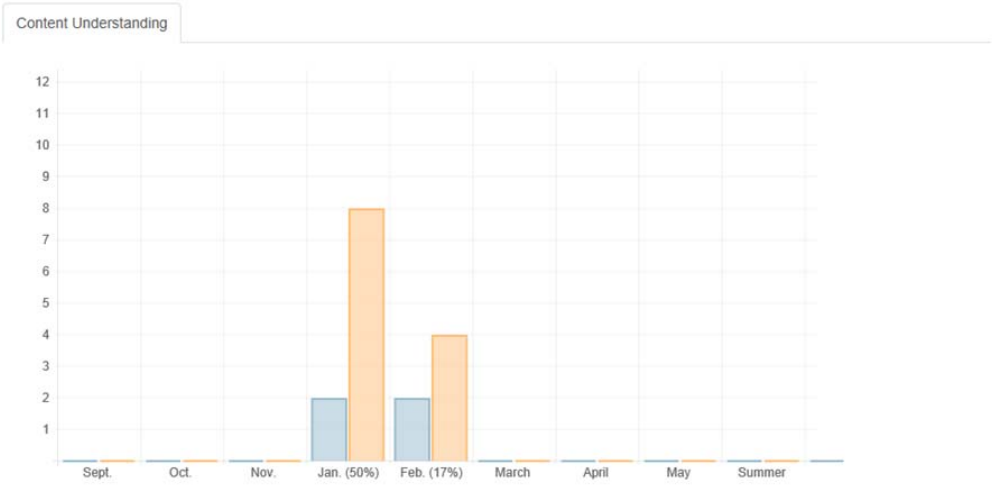
The findings of the present study were consistent with previous literature (e.g. Browder, et.al. 2008), that shows evidence of increased reading comprehension when using manipulatives to support reading materials in students with significant cognitive disabilities.

Students showed improvement in answering comprehension questions when using concrete objects related to the stories read to provide representations of the concepts presented in the readings.

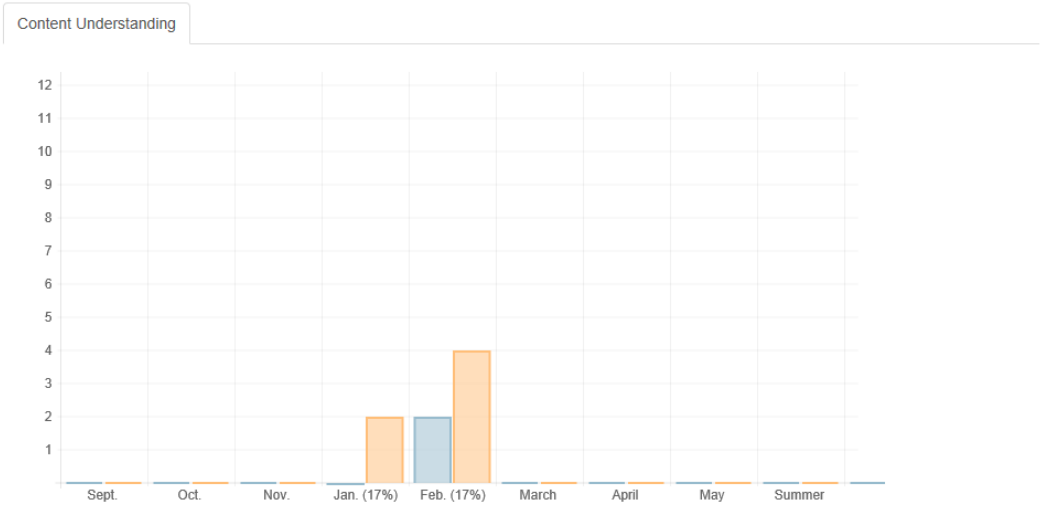
The information provided below will help the reader in understanding the findings.
Unique Learning System assessment. Students were assessed twice a month using the assessment provided by this curriculum. A comparison between correct number of questions answered previous to instruction and a post assessment given after instruction using objects showed improvements among participants.

Figure 1 shows improvement in the number of questions answered correctly for the four students in the study after instruction. The first, second, third and fourth graphs of Fig. 1 show the results of pretest in blue and the posttest in orange. All students showed improvement in the number of questions answered correctly after instruction using objects was provided.

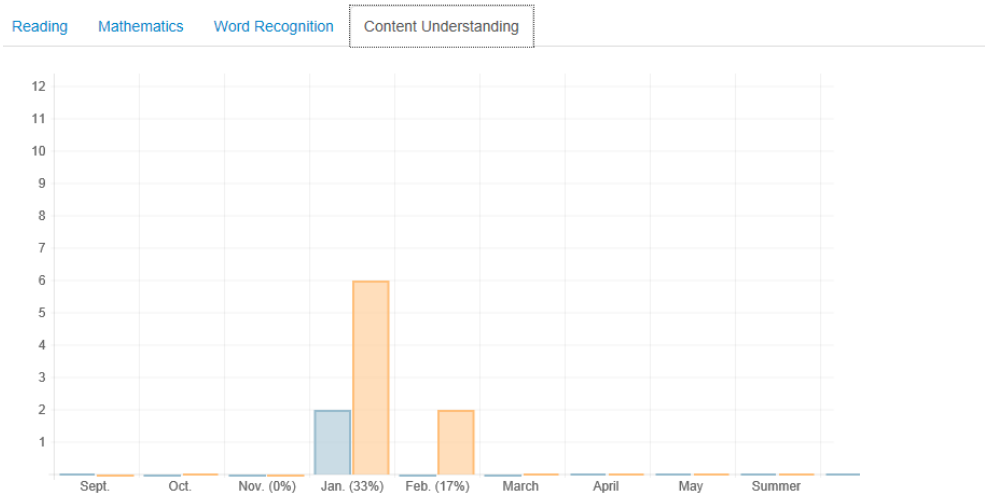
Student 1



Student 2



Student 3



Student 4

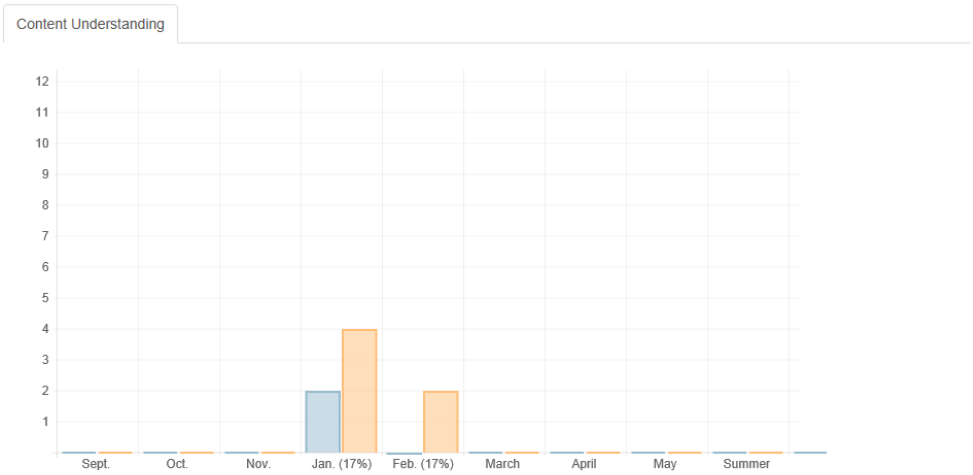
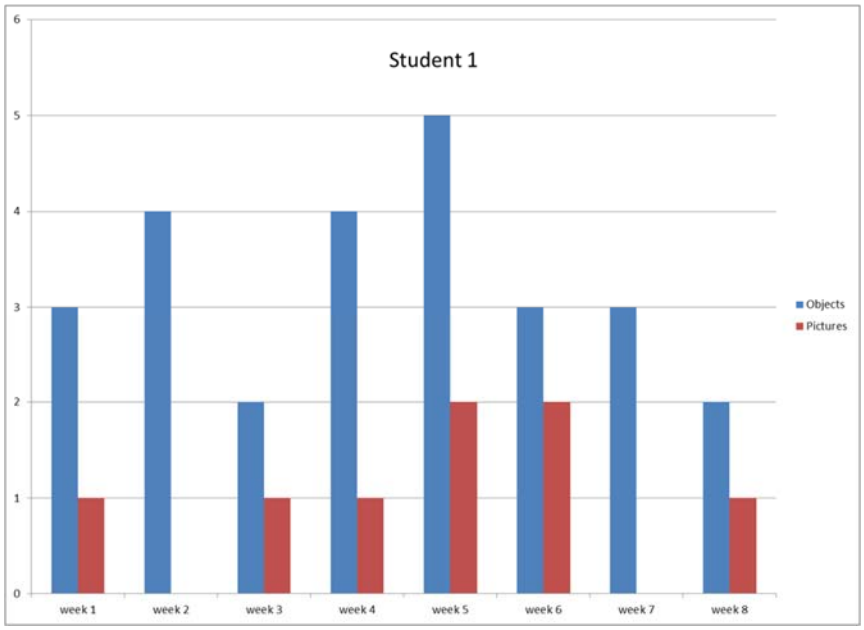
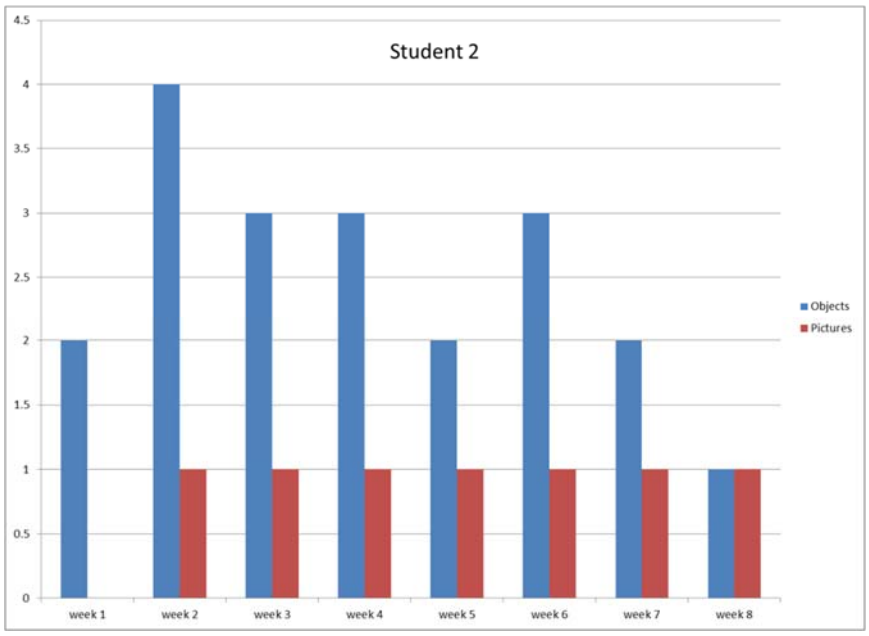


Figure 1. Comparison between questions answered correctly in a pre and posttest for students 1, 2, 3, and 4 using Unique Learning System Assessment.

Correct number of questions answered. There is a consistent increase in the number of questions answered correctly when using manipulatives to help students in reading comprehension. In general, all students answered more questions correctly when objects were used to provide support to the stories than when picture support was used.

Figure 2 shows the correct number of questions answered weekly by the four participants in the study when using pictures and when using objects. Graphs 1, 2, 3, and 4 of Fig. 2 show how many questions were answered correctly by students 1, 2, 3, and 4 every week when the researcher used picture support or object support with the stories read to the students.


Student 1
6
5
4
3
2
1
0
week 1
week 2
week 3
week 4
week 5
week 6
week 7
week 8
Objects
Pictures


Student 2
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
week 1
week 2
week 3
week 4
week 5
week 6
week 7
week 8
Objects
Pictures

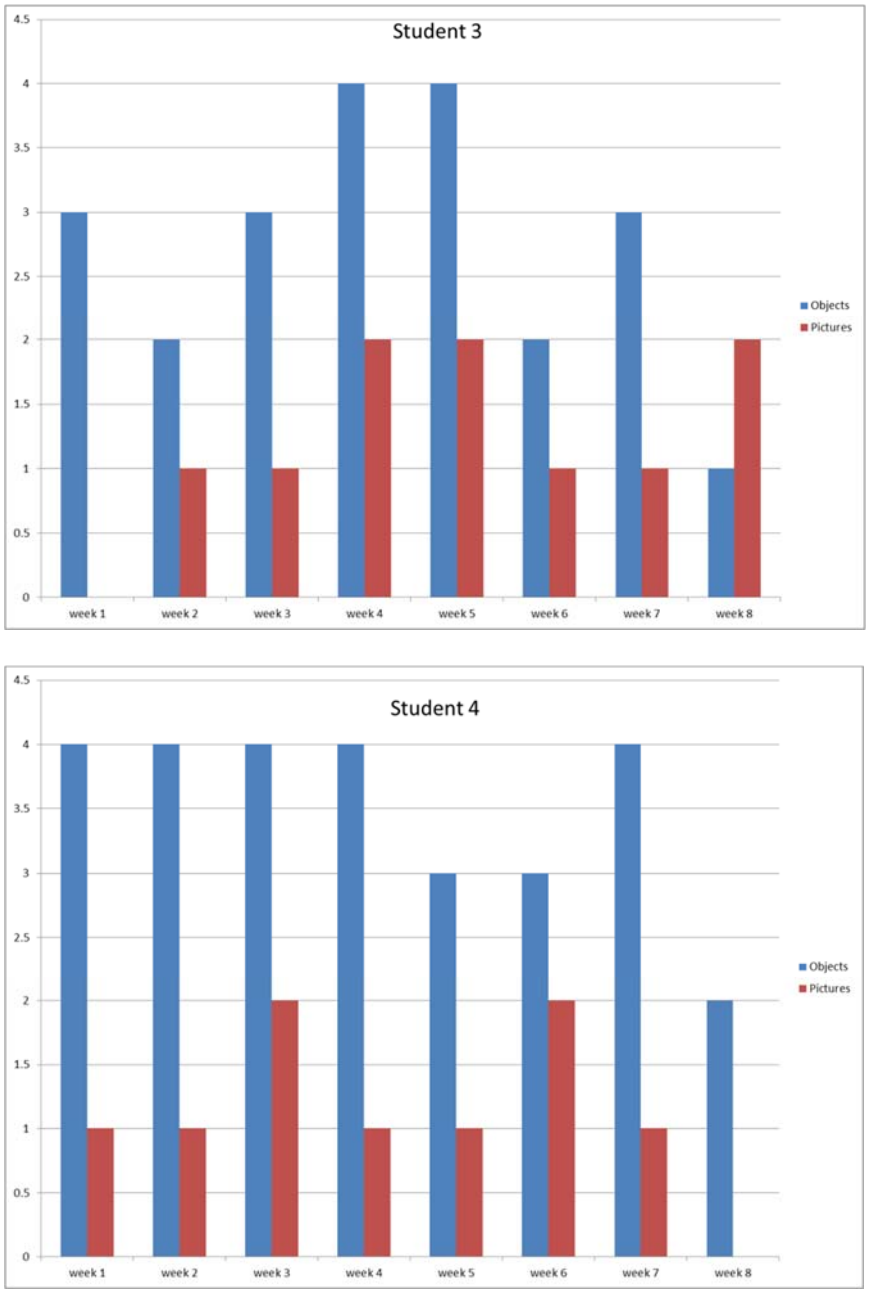


Figure 2. Number of correct answers to comprehension questions using picture support and real objects for each of students 1, 2, 3, and 4.

Checklists showing level of engagement. A checklist with indicators of student engagement with the activity was developed by the teacher. The indicators of engagement considered were: 1) Establishes eye contact with the teacher 2) Engages with the activity 3) Focuses on objects/pictures 4) Focuses on stories 5) Pays attention to questions 6) Tries to respond questions. These indicators were checked twice a week, once when the stories were read using picture support and the second time, when objects were used. The results indicated that all students showed better levels of engagement with the stories when manipulatives were used to support the concepts from the stories. To show the results, the researcher calculated total percentage of engagement with the activity based on the number of indicators marked positively.

The total number of indicators marked positively was added and divided by the number of total available indicators, for example, a student who received five yes positive indicators would obtain 86 % engagement with the activity (5/6 x 100)= 86 %).

Tables 1 through 4 display the percentages of engagement with the activity for students 1, 2, 3, and 4. For each student, the percentage of engagement was calculated when using picture support and when using object support and the results are displayed in the four Tables below.

Table 1
Percentage of engagement with the activity indicators when using picture support and manipulatives at reading times for student 1

Student1	Pictures	Objects
Week 1	-	83 %
Week 2	16 %	66 %
Week 3	16 %	50 %
Week 4	50 %	50 %
Week 5	33 %	83 %
Week 6	33 %	50 %
Week 7	33 %	83 %
Week 8	50 %	33 %

Table 2

Percentage of engagement with the activity indicators when using picture support and manipulatives at reading times for student 2

Student 2	Pictures	Objects
Week 1	-	50 %
Week 2	16 %	66 %
Week 3	16 %	66 %
Week 4	50 %	50 %
Week 5	33 %	16 %
Week 6	16 %	50 %
Week 7	16 %	50 %
Week 8	33 %	16 %

Table 3
Percentage of engagement with the activity indicators when using picture support and manipulatives at reading times for student 3

Student 3	Pictures	Objects
Week 1	-	66 %
Week 2	33 %	83 %
Week 3	50 %	50 %
Week 4	50 %	50 %
Week 5	50 %	66 %
Week 6	33 %	66 %

Week 7	50 %	66 %
Week 8	16 %	83 %

Table 4
Percentage of engagement with the activity indicators when using picture support and manipulatives at reading times for student 4

Student 4	Pictures	Objects
Week 1	-	100 %
Week 2	50 %	100 %
Week 3	83 %	83 %
Week 4	66 %	83 %
Week 5	66 %	50 %
Week 6	50 %	66 %
Week 7	66 %	83 %
Week 8	66 %	83 %

Discussion

Limitations

The results of this study are limited to the particular group of students that participated in it. Generalizations are not possible because the setting where the study took place is unique and differs from a regular school setting since it is a medical facility for medically fragile students and not a regular class.

Some of the positive results obtained may have been influenced by a practice effect since students heard the same text twice, one time using picture support and the second time using object support. To reduce a practice effect the readings were done at the beginning and at the end of the week and students were not told the correct answers until the second reading. Even though these measures were taken, it is not possible to completely rule out that some students may have remembered the materials and this may have an influence on the higher percentage of correct answers when using object support.

Implications

This group of students benefited from using real objects to increase reading comprehension. The strategy helped them to increase their engagement with the reading activities as well as to increase the number of questions they answered correctly. This strategy is being used with a larger number of students that also have significant cognitive disabilities and attend the same medical facility.

There are two implications for the field of special education that can be drawn from this study. The first implication is the fact that students with the most significant disabilities can obtain a better understanding of shared stories by providing them with concrete objects that represent the stories during reading. This provides a concrete representation of concepts that may be abstract or difficult to understand for them. Another implication is related to incorporating objects not only during story reading, but also when asking questions about the text as a way to respond to the questions. Choices between a correct and incorrect object should be provided. In this study, students were able to answer more questions correctly when objects were presented to them.

References

Browder, D. M., Gibbs, S., Ahlgrim-Delzell, L., Courtade, G. R., Mraz, M., & Flowers, C. (2009). Literacy for students with severe developmental disabilities: What should we teach and what should we hope to achieve?. *Remedial and Special Education*, *30*(5), 269-282.

Browder, D. M., Lee, A., & Mims, P. (2011). Using shared stories and individual response modes to promote comprehension and engagement in literacy for students with multiple, severe disabilities. *Education and Training in Autism and Developmental Disabilities*, *46*(3), 339-351.

Brower, D. M., Mims, P. J., Spooner, F., Ahlgrim-Delzell, L., & Lee, A. (2008). Teaching elementary students with multiple disabilities to participate in shared stories. *Research and Practice for Persons with Severe Disabilities*, *33*(1-2), 3-12.

Browder, D. M., Wakeman, S. Y., Flowers, C., Rickelman, R. J., Pugalee, D., & Karvonen, M. (2007). Creating access to the general curriculum with links to grade-level content for students with significant cognitive disabilities: An explanation of the concept. *The Journal of Special Education*, *41*(1), 2-16. doi: 10.1177/00224669070410010101

Goldstein, J., & Behuniak, P. (2012). Assessing students with significant cognitive disabilities on academic content. *The Journal of Special Education*, *46*(2), 117-127. doi: 10.1177/0022466910379156

Hudson, M. E., & Test, D. W. (2011). Evaluating the evidence base of shared story reading to promote literacy for students with extensive support needs. *Research and Practice for Persons with Severe Disabilities*, *36*(1-2), 34-45.

Kleinert, H. L., Browder, D. M., & Towles-Reeves, E. A. (2009). Models of cognition for students with significant disabilities: Implications for assessment. *Review of Educational Research*, *79*(1), 301-326.

Mims, P. J., Browder, D. M., Baker, J. N., Lee, N., & Spooner, F. (2009). Increasing comprehension of students with disabilities: Implications for assessment. *Education and Training in Developmental Disabilities*, *44*(3), 409-420.

Mims, P. J., Hudson, M. E., & Browder, D. M. (2012). Using read-alouds of grade-level biographies and systematic prompting to promote comprehension for students with moderate and severe developmental disabilities. *Focus on Autism and Other Developmental Disabilities*, *27*(2), 67-80. doi: 10.1177/1088357612446859

Ogletree, B. T., & Crawford, K. (2009). Communicative value of objects: Establishing iconic and indexical object experiences with individuals with severe intellectual disabilities. *Focus on Autism and Other Developmental Disabilities*, *24*(4), 248-251. doi: 10.1177/1088357609346732

Skotko, B. G., Koppenhaver, D. A., & Erickson, K. A. (2004). Parent reading behaviors and communication outcomes in girls with Rett syndrome. *Council for Exceptional Children*, *70*(2), 145-166.

Towles-Reeves, E., Kearns, J., Kleinert, H., & Kleinert, J. (2009). An analysis of the learning characteristics of students taking alternate assessments based on alternative achievement standards. *The Journal of Special Education*, *42*(4), 241-254. doi: 10.1177/0022466907313451