Meaningful Participation:

Hard Copy Presentation

versus

SMART Board Interactive Whiteboard Presentation

of a

Downloadable Newspaper

with Students with Autism

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June 4, 2007

Introduction

The instruction of students with autism is important to all school districts. In the Kettering City Schools of Ohio, thirty-three students out of 7,400 had the diagnosis of autism on their Individualized Education Programs (IEPs) on December 1, 2005. For the fifty other students with IEPs with the diagnosis of multiple disabilities or vision impairment on the same date, autistic-like behaviors were sometimes considered for management during the planning of the IEP goals.

The disorder of autism is accompanied by the risk of accompanying disorders that exacerbate behavior problems. Among these are sleep problems that may lead to daytime behavior problems. Depression, anxiety disorders, and obsessive/compulsive disorders may cause additional challenges to classroom instruction. Brief time intervals for instruction may have to be planned. Frequent assessments may be required to determine whether instructional programming is successful or if it needs adjustment. The instructional program will have to support the IEP goals, the school curriculum, the family, and the community.

Techniques of instruction, according to the American Speech-Language-Hearing Association (2006), commonly include repetition of content, strict schedules, written scripts, models by video or acting, computerized lessons, previewing of content, and role plays for generalization. Visual supports are often more successful than audio instruction according to many researchers (McEachin et al., 1993). In fact, research (Gerlach, 1993) indicates that the audio component of instruction probably confuses students with severe autism.

Inclusion of the students with autism with students who do not have autism is often recommended. It is thought that the behaviors of students without autism can represent models of appropriate behaviors for those with autism. However, the moments of the appropriate behaviors may be either too brief for their notice, or too advanced for them to copy. In addition, moments of inappropriate behaviors occur.

There is little research to support direct instruction of students with autism in groups of students who either have autism, or who have autistic-like behaviors. There is no research to support instruction of current events—rather than of social interaction—to increase language skills. However, to prevent the variables that would have an impact on this study if students without autism were included, and to eliminate the typical therapeutic intervention that focuses on social interaction, this study included only students with autism or with autistic-like behaviors, and focused on the improvement of language skills during instruction about current events.

Methodology: Preparation

News-2-You® is an online newspaper that is made available to subscribers in three forms. For students with autism at Kettering Middle School, the Simplified version is chosen to enhance the language curriculum. This version presents in print and in pictures—colored pictures and black print—an important, newsworthy topic. This version includes an illustrated page of ingredients and utensils for the weekly recipe. This version continues with one or more pages that illustrate the sequence of the recipe's steps. The final pages of this version present labeled illustrations of pictures for the students to select from, in order to describe the week's news, and a series of labeled, illustrated questions with a variety of possible answers about the information.

Each Monday, for a language lesson, weekly 8 to 10 page lessons were transferred from the online special education newspaper, *News-2-You*, in PDF form, to the SMART Board™ interactive whiteboard and Notebook™ interactive whiteboard software. Links of each page (as objects) were programmed by one of the authors of this paper. A page of animation, created with 2Animate software, or Mouse Trial autism software, was often added by an author of this paper. As a backup for two augmentative alternative communication (AAC) devices, the instructor put the topical pictures of the news story in a file folder. Occasionally, one of the devices was in repair, was not charged, or had dead batteries. The SMART Board interactive whiteboard was always operational.

Each Thursday, a printout of the hard copy of each weekly lesson was made available to students by an author of this paper. The illustrated recipe instructions were cut out, pasted on index cards, and laminated for use during the Thursday language lesson. Before the Thursday lesson, an author took the students on a shopping lesson to a grocery store in order to instruct the students in purchasing the ingredients. Incidentally, shopping skill development is a component of the school's Community Based Instruction (CBI) program.

Methodology: Documentation

Population for study

A baseline of performance with only the hard copy was taken from the students with autism and with autistic-like behaviors who were enrolled during the final three-quarters of the previous school year, 2005-06. A baseline of performance with the hard copy for the students newly enrolled in the CBI program was made during the first four weeks of the current school year, 2006-07. Due to the transfer of nearly all of the 2005-06 students to other schools, other classrooms, and other groups, and due to the challenge of the newly enrolled students to learn a new school's routine, only the baseline data collected during the first four weeks of the 2006-07 school year was included in the study. The SMART Board interactive whiteboard component of the study was introduced during the fifth week of the school year.

The final study included four students—three with severe autism, and one with a visual impairment as well as severe autistic-like behaviors. Data collection with the four students ended May 31, 2007.

Data collection

1. Success in answering or asking three relevant "Wh-" questions was documented at the end of each session. The Individualized Education Program goals determined whether the student was encouraged to answer or ask the questions.

2. Success in naming (out loud, by pointing, or by selecting a cell on an augmentative device) ingredients for the weekly recipe, or in indicating a preference for one item, were documented at the end of each session.

3. Spontaneous comments by the students were documented throughout the sessions.

4. Minutes spent by students seated in their chairs without getting up, except when asked, were documented for each session.

5. Finally, the data of the weekly Monday session with the SMART Board interactive whiteboard, and of the weekly Thursday session without it, were compared at the end of every four weeks. The average scores were again averaged for a final score at the end of the school-year-long study.

Methodology: Instruction

One of the authors prepared the students for the instructional sessions *before* the sessions began. To help one student stay seated, the instructor sometimes monitored him on a school treadmill for fifteen minutes. To help another student focus on school supplies rather than her personal items brought from home, the instructor always gradually removed numerous plastic "storybook figures" from her backpack. To decrease the third student's echolalia and self-talk, the instructor often encouraged him to put on headphones and hold a rubber chicken when it was not his turn to talk. To decrease the fourth student's anxiety about the lesson's social interaction, the instructor often gave her a pre-lesson quiet-time with paper-and-pencil work.

Following these readiness procedures, the other author of this paper presented the lessons.

Each Monday, the instructor walked to the side of the SMART Board interactive whiteboard. She pointed to the three most important vocabulary words for the lesson. The illustrated vocabulary always communicated an event, the event's location (generally a U.S. state, or a country outside of the U.S.), and the month of the event. The illustrations of the news story were repeated on the SMART Board interactive whiteboard. Each of three students took a turn to walk to the SMART Board interactive whiteboard in order to "turn" to a needed page. That is, each student, when called upon, tapped the board and watched the page link to the next one. The student with a visual impairment could see the pictures from his front-row seat and increasingly accurately name them. The male nonverbal student communicated the vocabulary by selecting the appropriate cell on his speech-synthesized Impact® communication software Palmtop device, or by choosing the correct hand-held picture from a field of two pictures that were presented to him by the instructor. The female nonverbal student matched the vocabulary of the news event by pressing the illustrated and speech-digitized (recorded) name of the event, its place, and its month on her 32-cell AMDI® Tech/Speak™ with Environmental Controls device when the same illustration was presented on the SMART Board interactive whiteboard. A fourth student asked the other three students questions, with increasing accuracy in the use of written cues, such as "What's the news about?" "Where's the event?" and "When's the event?"

Students were also given turns to come to the SMART Board interactive whiteboard to circle illustrations of foods in the recipes, topics in the news article, and answers to the three weekly questions.

Students commented on the news. For example, one student selected illustrations of the feelings of people in the news by pressing a cell on his speech-synthesized device. Another student selected illustrations on her device that were relevant to the theme (such as her age or her opinion—"O.K." or "terrible"—of the news). The visually impaired student sometimes made sounds (animal or environmental noises) that were appropriate to the theme to supplement the news.

Each Thursday, again following readiness procedures by her colleague, one instructor showed the hard copy of the Simplified version of *News-2-You* to the four students. Once again, the students commented on the page of ingredients ("O.K." or "terrible"). The students were encouraged to follow the recipe sequence in order to make the week's recipe. The students summarized the news by selecting and passing to another student an appropriate paper illustration, or by pressing a cell on their AAC devices. A verbal student increasingly accurately recalled the three Wh-question words for the news and selected the questions from written scripts when illustrated answers were shown by the instructor or by a classmate.

During both the Monday and Thursday sessions, the students were expected to remain in their seats except when called on to take a turn–at the SMART Board interactive whiteboard on Mondays, or at the kitchen counter on Thursdays. During both the sessions, the students were expected to respond with accurate information. Spontaneous comments were encouraged throughout each session.

Purpose of the Study

This study was designed to compare (1) the use of a SMART Board interactive whiteboard to increase students' knowledge of the language arts curriculum with (2) the use of a written newspaper when the targeted information (name of event, its place, and its month) was identical. Only one published project (McCormick, 2005) refers to the use of the SMART Board interactive whiteboard for instructing *News-2-You* in classrooms of special education students. None of the participants in that project were diagnosed with autism or demonstrated autistic-like behaviors, according to the study's report. A similarity, however, was that all of the students in that project and all of the students in this project were enrolled in a Community Based Instruction (CBI) program. Current events, both of the local community and of the world, are a natural vehicle for overall instruction in CBI programs.

Results

After nine months of instruction (the length of time of a U.S. school year, during which collaboration between the classroom instructor and the speech pathologist occurs) with the same information presented during a weekly session with the SMART Board interactive whiteboard, and a weekly session without it, the average results indicated superior instruction with the SMART Board interactive whiteboard than without it. This was in spite of the fact that the preview of the information (on Monday) was with the SMART Board interactive whiteboard, while the review of the information (on Thursday) was without it!

A. Accuracy asking three questions with a written script with illustrated answers:

With the SMART Board interactive whiteboard: 95%.

Without the SMART Board interactive whiteboard 66%.

B. Accuracy answering three questions from a field of at least two pictures per question:

With the SMART Board interactive whiteboard: 95%.

Without the SMART Board interactive whiteboard: 66%.

C. Accuracy naming ingredients for the weekly recipe or consistently indicating a preference for one item:

With the SMART Board interactive whiteboard: 95%.

Without the SMART Board interactive whiteboard: 66%.

(The student with a visual impairment could not see or identify the significantly smaller pictures on the hard copy.)

D. Accuracy summarizing the three most important concepts and vocabulary words of the news from a field of at least six illustrations:

With the SMART Board interactive whiteboard: 100%.

Without the SMART Board interactive whiteboard: 80%.

E. Spontaneous comments and social interactions by the students:

With the SMART Board interactive whiteboard: 10 per session.

Without the SMART Board interactive whiteboard: 3 per session.

F. Minutes spent by students seated in their chairs without getting up, except when asked, during an average thirty-minute session, which included 25 minutes of seated instruction:

With the SMART Board interactive whiteboard: 24 of 25.

Without the SMART Board interactive whiteboard: 15 of 25.

G. Range of average overall accuracy of information at the end of each four weeks:

With the SMART Board interactive whiteboard: 80-100%.

Without the SMART Board interactive whiteboard: 55-66%.

Conclusion

After one school year of comparative instruction, the instruction with the SMART Board interactive whiteboard resulted in a range of significantly more accurate responses than without. Skills in questioning and in formulating appropriate answers and comments increased, as targeted by the IEP goals.

The unexpected benefit of this project, for this paper's authors, has been the increase in interaction between the students while they are engaged in instruction with the SMART Board interactive whiteboard. Surprisingly, this instruction resulted in increased spontaneous and appropriate social interactions. Since the students have delayed-social-interaction skills, the playful atmosphere while working with the SMART Board interactive whiteboard seemed to give them confidence to engage with one another by passing pictures.

The achievement of joint attention tunnels (Murray et al., 2005) occurred, in that the students shared the details that they learned with their peers by marking on the SMART Board interactive whiteboard “pages” their (increasingly accurate) choices of illustrated vocabulary. The students used their hands to choreograph stunning visual effects with Mouse Trial autism software that were incorporated into some of the weekly newspapers, and with the colored inks of the creative pens that were always available. During the study, the students became increasingly calm, as evidenced by their increased seat time when seat time was appropriate.

Sensory overload was avoided during the SMART Board interactive whiteboard presentation. When the hard copy was presented, the instructor read out loud page after page in an unsuccessful effort to maintain students' attention. Her eye contact and the auditory component of her instruction may have interfered with the instructional content of the illustrations of the hard copy.

Further research with the SMART Board interactive whiteboard is recommended in an environment without instructor verbalization or eye contact.

The shining eyes, proud upright posture, and high-fives that followed tapping the SMART Board interactive whiteboard, and that followed circling correct illustrations on the SMART Board interactive whiteboard *in front of their peers,* were delightful for their instructors to experience. As evidenced by anecdotal data, the students' interactive moments with their peers increased through the SMART Board interactive whiteboard. The thrill is that the long-term carry-over of increased social interaction is evident – because of SMART Board interactive whiteboard instruction!

References

American Speech-Language-Hearing Association. (2006). Guidelines for speech-language pathologists in diagnosis, assessment, and treatment of autism spectrum disorders across the life span. Retreived from http://www.asha.org/members/deskref-journal/deskref/default

Gerlach, E. (1993). *Autism treatment guide*. Eugene, Oregon: Four Leaf Press.

McCormick, S. (2005). Smartboard slideshow: Using the Smartboard for alternative academic instruction. Retrieved from http://escportal.net/regioniv/Portal/Search

McEachin, J. J., Smith, T., & Lovaas, O.I. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. *American Journal of Mental Retardation*, *97*, 359-372.

Murray, D., Lesser, M., & Lawson, W. (2005). Attention, monotropism, and the diagnostic criteria for autism. *Autism*, *9* (2) 150.