Literacy Based Behavioral Interventions and Video Self-Modeling with students with Autism Spectrum Disorder (ASD)

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Abstract

Educators are continually seeking effective, research-based strategies to address the unique needs of their students with autism spectrum disorders (ASD). It is well documented that students with ASD benefit from direct instruction and visual supports when learning new skills. This article provides step-by-step procedures for using a tiered intervention package consisting of literacy-based behavioral interventions and video-self modeling to teach new skills to students with ASD to promote mastery and independence. Authors share an action research process that was used to identify a need for students with ASD in a middle school classroom, select and implement research-supported interventions to address the need, and to monitor progress throughout the phases of intervention to make instructional decisions.

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> *Mrs. Miller teaches students with moderate to severe autism in a middle school self-contained classroom. The students have individual IEP goals that are based on academic skills, social communication skills, and life skills. After the first several months of school, Mrs. Miller wanted to address one main problem: her students often required extensive verbal and physical teacher prompts when engaging in activities and learning new skills. She wanted to implement interventions that would decrease this prompt dependency and increase independence for each of her students. Mrs. Miller researched numerous evidence-based practices that could be used to teach new skills to students with autism spectrum disorders (ASD) to promote independent functioning. It was evident through her research that students with ASD often benefit from visual supports and explicit instruction. Thus, Mrs. Miller decided to implement interventions for her students using a combination of literacy-based behavior interventions and video self-modeling to provide the explicit instruction and visual supports her students need to learn new skills and achieve independence.*

Autism spectrum disorders (ASD) are neurological disorders that adversely affect social and communication abilities (Bellini, Akullian, & Hopf, 2007). There are three autism spectrum disorders: Autism, Asperger Syndrome, and Pervasive Developmental Disorder-Not Otherwise

Specified (PDD-NOS). Individuals with ASD require more support in the areas of academics, behavior, communication, and social skills and benefit from explicit instruction in these areas (Bellini, 2006). They often have difficulty functioning independently (Hume, Loftin, Lantz, 2009). There are a variety of research-supported interventions that can be used to teach students with ASD to perform new skills and reach independence. It is well documented that students with ASD benefit from the use of visual supports (Ganz, Earles-Vollrath, & Cook, 2011). Visual aids can help students with ASD learn abstract concepts, follow unfamiliar or complex directions, and become more independent. This article discusses how to use literacy-based behavior intervention (LBBI) and video self-modeling (VSM) to provide visual supports when teaching new skills to students with ASD to promote mastery and independence.

Literature Review

LBBI and ASD
The term LBBI includes a variety of interventions that provide instruction through print or pictures using full or partial sentences, written reminders, stories, photographs, drawings, comic-strip illustrations, or other media (Bucholz & Brady, 2008). A commonly used LBBI is a Social Story™ (Gray, 2000), which is a personalized short story that describes a situation, skill, or concept from the perspective of the individual to help improve understanding. Research shows positive outcomes when using Social Stories™ with students with ASD (Chan, et al., 2011; Crozier & Tincani, 2007; Delano & Snell, 2006; Ozdemir, 2008; Scattone, Tingstrom, & Wilczynski, 2006) While Gray sets forth specific guidelines for using certain sentence types and story formulas, many educators do not strictly follow these guidelines (Hagiwara & Myles, 1999; Swaggart et al., 1995) because other types of sentences and story formats can have a more powerful impact in particular situations (Bucholz, Brady, Duffy, Scott, & Kontosh, 2008). LBBIs that allow more flexibility when constructing sentences and creative freedom to supplement words with pictures for students with significant disabilities allow practitioners to tailor interventions to the individual needs of students.

VSM and ASD
Video self-modeling (VSM) can be defined as a video of a student performing a target behavior (Graetz, Mastropieri, & Scruggs, 2006). The purpose of VSM is to provide opportunities for students to view themselves demonstrating the targeted skills so they can imitate what they observed when the video is over. Of course, behind the scenes prompting and careful editing must be used to be able to develop videos of students demonstrating skills that either are not yet in their repertoire or are not displayed on a frequent enough basis. There are several studies that demonstrate the effectiveness of using VSM with students with ASD (Apple, Billingsley, & Schwartz; 2005; Bellini & Akullian, 2007; Bellini et al., 2007; Buggey, 2005). While more empirical research on using VSM with students with ASD is still needed, the studies that have been conducted indicate that VSM positively impacts the academic, behavioral, and social skills of students with ASD (Bellini et al., 2007; Hitchcock, Dowrick, & Prater, 2003).

LBBI and VSM for Students with ASD

This article provides eight steps for using a tiered intervention that incorporates both LBBI and VSM to teach new skills to students with ASD to promote skill mastery and independence. This approach brings the LBBI and VSM research into practice in a manner that is simple for

educators to use to teach a variety of skills and enhance the independence of their students. With the tiered approach, teachers first introduce an LBBI. If the student does not reach independence with the sole use of the LBBI, the VSM intervention is then introduced until the student reaches independence. Since creating videos for the VSM intervention is more time consuming than creating LBBIs, and since both interventions are research supported, it is beneficial to first implement the LBBI and dedicate the time to create the video for the VSM intervention only when necessary. There are eight simple steps educators can follow when implementing a LBBI and VSM tiered intervention for students with ASD. Each step is described below and then highlighted with two case examples from Mrs. Miller's class.

Step 1: Select a target skill
There are many skills that can be targeted using LBBI and VSM such as communication skills, social interaction skills, daily living skills, organizational skills, employment-related skills, and academic skills. It is important to choose a skill that is meaningful for the student and will make a significant positive impact on the student's life when mastered. The skill selected should be observable, measurable, developmentally appropriate, positively stated, and indicate a criterion for mastery.

Step 2: Collect baseline data
Before developing and implementing an intervention, be sure to collect baseline data on the targeted skill. Collecting baseline data prior to the onset of intervention allows educators to determine the effect of the intervention. Using a task analysis is an easy and meaningful way to collect data. This entails writing down each of the steps required for the student to perform the skill in order. For each step, indicate if the student performed it independently or with prompting. Then, divide the number of independent steps by the total number of steps to get a percentage of steps performed independently.

Step 3: Develop an Individualized LBBI
When developing an individualized LBBI, a Social Story© can be used, a modified Social Story© can be used, or an individualized sentence structure can be used. The complexity of the language should be tailored to the comprehension abilities of the student. Using PowerPoint© to develop the LBBI is recommended because it is easy to include pictures, symbols, large text, and audio of the teacher, a peer, or the student reading the text of the LBBI. It also allows students to view the LBBI independently on a computer, IPAD, IPOD, or Smart Board without the need for 1:1 instruction each time the LBBI is reviewed.

Step 4: Begin the LBBI Intervention
The LBBI intervention should be shown immediately before the student is expected to perform the target skill each time. The LBBI intervention should be more than just showing the PowerPoint© to the student. There should be comprehension checks during and after the viewing of the PowerPoint© using verbal or nonverbal responses to make sure the student understands the content of the LBBI. These comprehension checks can be in the form of retells, sequencing activities, responding to questions, or role-play activities.

Step 5: Monitor Progress
It is important to monitor the student's progress on a daily basis once the LBBI intervention is implemented. This should be done using the same data collection procedures used when collecting baseline data to allow a comparison of pre-intervention and intervention performance.

Step 6: Initiate a VSM Intervention if Necessary
If the student achieves mastery during the LBBI phase, skip to step 8. If the student does not achieve mastery during the LBBI, add a VSM component to the intervention. Once the video is created, it can be embedded at the end of the LBBI PowerPoint© to provide additional instruction to the student beyond the pictures, text, and audio. The reason why it is recommended to first try the LBBI without the VSM is because it can be quite time-consuming to capture the video footage needed for the VSM intervention. If the student can learn the skill with the LBBI alone, it will save a great deal of time. However, if the student is unable to achieve mastery with the LBBI, the time it takes to develop a VSM intervention can be well worth it.

Step 7: Monitor Progress
Continue to monitor the student's progress on daily basis once the VSM is added to the LBBI intervention using the same data collection procedures. Indicate when the VSM was added to the intervention to be able to determine if the addition of the VSM results in a significant difference in the student's performance.

Step 8: Fade Out the Interventions
Once the student is consistently able to demonstrate the targeted skill independently, the LBBI and VSM intervention can be faded out. The fading out should be done gradually by moving from daily implementation to every other day to once a week to not using it at all. If, at any time during the fading process, the student ceases to demonstrate the targeted skill independently, increase the use of the LBBI and VSM intervention until consistent performance is demonstrated once again. Then gradually fade out the interventions once again.

Case 1
Mark was a 12-year-old male with autism in Mrs. Miller's class who was nonverbal. During an informal career assessment conducted by Mrs. Miller, Mark indicated that he was interested in learning more about working in a greenhouse. Watering plants would be a key component of this job. Mark became responsible for watering the plants at the entrance of the school building on a daily basis with the assistance of a paraprofessional. Mrs. Miller's observations indicated that Mark depended on hand-over-hand assistance from the paraprofessional for almost all of the key tasks.   Therefore, Mrs. Miller wanted to use an LBBI and VSM intervention to teach Mark how to independently water the plants at school (Step 1).

Before implementing the LBBI, Mrs. Miller and her paraprofessional, Mrs. Towns, took turns observing Mark as he watered the plants over the course of one school week. During their observations, Mrs. Miller and Mrs. Towns recorded baseline data to pinpoint the steps Mark was struggling with the most (Step 2). They also used this time to take pictures and video clips of Mark watering the plants, which would later be used for the LBBI and VSM. Once the baseline data were collected, Mrs. Miller developed a short LBBI that incorporated simple sentences

describing the expectations for watering the plants and pictures of Mark watering the plants around the school (Step 3). See Figure 1 for the text from Mark's LBBI.

Figure 1
Mark's LBBI

Mark Waters the Plants

My name is Mark. It is my job to water the plants every day at school.
First I put the pitcher in the sink under the faucet.
Then, I turn the water on.
 I fill the pitcher with water.
When the pitcher is full of water, I turn the faucet off.
I carry the pitcher outside with both hands to the plants.
I bend down and water the plants.

For two weeks, Mark participated in the LBBI phase of the intervention (Step 4). During this phase, Mrs. Miller showed Mark his LBBI every day before he left the classroom to water the plants. The LBBI was shown on the interactive Promethean board in a PowerPoint©. While viewing the PowerPoint©, Mrs. Miller asked Mark to follow along as she read the LBBI. She would also stop reading and have Mark point to items in the pictures, such as the sink. In addition, Mrs. Miller had Mark demonstrate his comprehension of the text by asking him to model the steps, such as bending over to water the plants.

Mrs. Miller and Mrs. Towns monitored Mark's progress during the two-week LBBI Phase (Step 5). See Figure 2 for the data sheet used to monitor Mark's progress. The data showed that the LBBI did improve Mark's abilities to independently water the plants. He was able to complete an average of 70% of the steps independently. The goal, however, was for Mark to complete *all* of the required steps with independence. Therefore, Mrs. Miller decided that it was necessary to implement the VSM phase of the intervention (Step 6).

Figure 2
Mark's Data Sheet

Date: _____

Observer:_____

Task	Competed Independently (yes or no)	Comments
Place pitcher under faucet		
Turn on water		
Turn off water when		

pitcher is full		
Carry pitcher outside		
Bend down towards plant		
Water plant		

Percentage Completed Independently: _____

During the VSM phase, Mrs. Miller added a video of Mark independently performing all of the steps required for watering the plants to the end of the LBBI PowerPoint©. Mark continued to participate in the intervention just before leaving the classroom to water the plants. Mrs. Miller used the same comprehension checks that were embedded during the LBBI Phase. Mark participated in the VSM phase of the intervention for one week. Throughout the week, Mrs. Miller and Mrs. Towns monitored Mark's progress (Step 7). The data indicated that the VSM was beneficial for Mark when paired with the LBBI. He went from completing an average of 70% of the steps independently with just the LBBI to completing 93% independently with both the LBBI and VSM interventions the first week of the combined intervention. Mrs. Miller faded out the LBBI and VSM intervention once Mark reached 100% independence (Step 8).

Case 2
David was a 13-year-old male with autism in Mrs. Miller's class who had some functional speech. He was able to greet others by saying "Hi," "Hey," or "Hello." Mrs. Miller's observations indicated that David frequently greeted typically developing peers and adults in the hallways at school without prompting, but was unable to independently respond to complex greetings from others such as, "David, how are you?" Thus, this was his goal for the LBBI and VSM tiered intervention (Step 1).

Mrs. Miller and Mrs. Towns observed David's interactions with others for one school week to record baseline data (Step 2). They monitored David's ability to make eye contact, verbally greet others, wait for a reply, and give an appropriate verbal response. This baseline data showed that David was able to complete an average of 40% of these skills over a five-day period. During this baseline phase, Mrs. Miller and Mrs. Towns took a variety of pictures and video clips of David's social interactions. Mrs. Miller then compiled the pictures to create an LBBI in the form of a PowerPoint© that showed David independently engaging in appropriate social interactions with supporting text describing the expectations for greetings (Step 3). See Figure 3 for the text from David's LBBI.

Figure 3
David's LBBI
David Talks to Others
My name is David. I like to talk to other people.
When I see a person I know, I should tell them, "Hi."

I need to look them in the eyes when I talk to them.
 I need to wait for the other person to talk back to me.
When the person asks me how I am, I need to respond by saying, "Good."
Following these steps makes talking with others more fun.

For two school weeks, David viewed his LBBI PowerPoint© on the interactive Promethean board every day before leaving the classroom for lunch (Step 4). Similar to Mark's intervention, Mrs. Miller checked for comprehension as she read the LBBI to David by asking him to model the skills shown in the pictures. Mrs. Miller and Mrs. Towns monitored David's progress during the transitions in the hallways as he saw familiar peers and adults (Step 5). See Figure 4 for the data sheet used to monitor David's progress. After just a few days of participating in the LBBI (Step 6), David was able to independently perform all four targeted social skills. Therefore, Mrs. Miller did not see the need to implement the VSM intervention (skipped Step 7). Mrs. Miller faded out the use of the LBBI after two weeks of independent performance (Step 8).

Figure 4
David's Data Sheet

Date: _____
Observer: _____
Social Partner: _____

Task	Completed Independently (yes or no)	Comments
Made eye contact		
Gave a verbal greeting		
Waited for reply		
Made appropriate verbal response to reply		

Percentage Completed Independently: _____

Conclusion

Mrs. Miller's work using LBBI and VSM with her students with ASD is an excellent example of how teachers can address student needs by implementing action research. She identified a problem, reviewed the literature to determine which interventions were likely to address the problem, and planned and implemented an intervention while monitoring progress to determine its effectiveness. Although Mrs. Miller's students required extensive prompting to engage in the targeted skills prior to the intervention, they were able to reach mastery and independence as a result of the LBBI and VSM intervention.

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