

Using an iPod Touch to Teach Social and Self-Management Skills to an Elementary Student with Emotional/Behavioral Disorders

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Abstract

A ten year-old boy exhibiting frequent off-task and disruptive behavior during small group math instruction was taught to use an iPod Touch for video modeling and self-monitoring purposes. A single-subject changing conditions (A-B-BC) design was used to investigate the differential effects of video modeling versus a combination of video modeling and self-monitoring. During the first intervention phase, immediately prior to participating in a math group, the student viewed a 3-minute video in which peers modeled appropriate math group behavior. Video modeling resulted in a significant increase in on-task behavior and decrease in disruptive behavior. However, results showed variability across sessions. For the second intervention phase, the student was taught to self-monitor his behavior during math group. A combination of video modeling and self-monitoring then resulted in a consistent increase in percent of intervals on-task (near 100%), as well as consistently low levels of targeted disruptive behavior.

Students with emotional and behavioral disorders (EBD) repeatedly display off-task and disruptive behaviors in classroom settings (Gresham, Lane, MacMilan, & Bocian, 1999; Wehby, Symons, & Shores, 1995). These behaviors often result in the student with EBD experiencing negative outcomes such as removal from the instructional environment, decreased exposure to academic materials and decreased opportunities to learn (Carr, Taylor, & Robinson, 1991; Wehby, Symons, Canale, & Go, 1998), decreased academic proficiency and content knowledge (Nelson, Benner, Lane, & Smith, 2004), and difficulty forming or maintaining positive peer relationships (Cook et al., 2008). The disruptive classroom behavior of students with EBD can negatively impact the learning and behavior of other students

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in the classroom (Gunter, Denny, Jack, Shores, & Nelson, 1993; Mitchem, Young, West, & Benyo, 2001; Wehby et al., 1995), and has even been attributed to educators choosing to leave the profession (George, George, Gersten, & Grosnick, 1995; Singh & Billingsley, 1996). Consequently, teachers, as well as students with and without disabilities, would benefit from effective and feasible classroom-based interventions for students engaging in high rates of off-task and disruptive behaviors.

Video Modeling

Video modeling involves showing the learner a video of a model (i.e., self, peer, expert, or “first person viewpoint”) performing a skill or skill sequence (e.g., transitioning from one activity to the next) (Baker, Lang, & O’Reilly, 2009). Typically, these videos are viewed either on a television or computer prior to task engagement and the learner is expected to perform the skill shortly after viewing the video. One advantage of video-based instruction is that strategies like video modeling rely on having the student watch a video (Baker et al., 2009). Once the video is created, only a minimal amount of time and effort is required to implement the strategy. To date, researchers who have studied video-based instruction have demonstrated that it usually results in faster skill acquisition on the part of the learner and generalization to untrained settings (Ayres & Langone, 2009; Hitchcock, Dowrick, & Prater, 2003; Mechling & O’Brien, 2010).

Although much of the research on the use of video modeling or video-based instruction has been conducted with students with developmental disabilities or students with autism spectrum disorders (Gul & Vuran, 2010), Baker et al. (2009) recently conducted a review in which they identified sixteen empirical studies in which video-modeling had been used successfully with students with emotional and behavioral disorders. With students with EBD, video modeling has proven to be effective in improving peer interactions (Falk, Dunlap, & Kern, 1996; Kern et al., 1995; Kern-Dunlap et al., 1992), increasing on-task behavior (Booth & Fairbank, 2000; Clare, Jenson, Kehle, & Bray, 2000; Walther & Beare, 1991), and decreasing inappropriate behaviors (O’Reilly et al., 2005; Schwan & Holzworth, 2003; Wolterdorf, 1992; Embregts, 2002).

Self-Monitoring

Self-monitoring is a multi-step process of observing and recording one’s own behavior (Mace, Belfiore, & Hutchinson, 2001). Self-monitoring typically includes two primary steps, 1) teaching the student to discriminate when the target behavior has, and has not,

occurred, and 2) teaching the student to self-record the target behavior (i.e., 'on/off-task', rate or accuracy) (Nelson & Hayes, 1981). Self-recording is commonly completed with the student using paper and pencil worksheets to record occurrence of the target behavior in conjunction with a timer/buzzer (Gluchak, 2008).

Self-monitoring has a strong history of success in helping students control challenging behavior (Carr & Punzo, 1993; Harris, Friedlander, Saddler, Frizzelle, & Graham, 2005; Reid, Trout, & Schartz, 2005; Rock, 2005). Self-monitoring has been used successfully with a variety of students, including those with attention-deficit hyperactivity disorder (DuPaul, Eckert, & McGoey, 1997; Harris et al., 2005; Reid, et al., 2005), oppositional defiance disorder (DuPaul & Hoff, 1998), learning disabilities (Dalton, Martella, & Marchand-Martella, 1999; King-Sears & Bonfils, 1999), and emotional and behavioral disorders (Carr & Punzo, 1993; Kern & Dunlap, 1994).

Hand Held Devices

Recent research suggests that handheld computers, when used as prompting systems, are effective for promoting independent correct responding among individuals with developmental disabilities (Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider & Grider, 2009). In addition, Gulchak (2008) taught an eight year-old boy with EBD to use a Palm Zire 72 handheld to self-monitor his on-task behavior during a one-hour reading period. Handheld devices appear to be effective at reducing the amount of prompting and assistance from teachers during task-engagement and have been used to encourage time management and scheduling among students with disabilities (Davies, Stock, & Wehmeyer, 2002), as well as initiation and completion of daily tasks among individuals with ADHD (Epstein, Willis, Conners, & Johnson, 2001). Handhelds are also desirable because they are portable, relatively inexpensive, and used frequently among individuals without disabilities, which potentially makes their use socially acceptable and reinforcing.

Past research has shown that the strategies mentioned above (video modeling, self-monitoring, and use of hand-held devices) can be successful in addressing problem behavior and teaching new skills. Video-based instruction has been used effectively as a technique for teaching a variety of pro-social and functional skills (Ayres & Langone, 2009; Baker et al., 2009; Gul & Vuran, 2010). Self-monitoring also has a strong history of producing positive behavior change (Carr & Punzo, 1993; Harris et al., 2005; Rock, 2005). In addition, researchers are beginning to investigate the use of portable, handheld solutions for teaching critical skills (Gulchak, 2008; Van Laarhoven et al., 2009).

Therefore, it was reasoned that combining components of these previously proven strategies (i.e., video modeling using a handheld device) might result in another equally (or more) effective strategy. An aim of this study was to investigate the effectiveness and classroom feasibility of video modeling and self-monitoring delivered via an iPod Touch by implementing them in subsequent phases, thus allowing for some comparison of these two types of classroom-based interventions on the behavior of a target student. The purpose of this study was twofold. First, to determine if video modeling, delivered on an iPod Touch, used alone or in combination with self-monitoring, would result in increased appropriate behavior during small group instruction. Second, to demonstrate the potential use of hand-held technology to facilitate the implementation of commonly used classroom interventions such as self-monitoring and video modeling.

Methods

Participant and Setting

Participant. The participant for this study was Andy, a 10-year-old male 5th grade student with emotional and behavioral disorders. Andy was abandoned at birth in a Russian hospital and lived in a Russian orphanage until he was adopted at age five. Andy was diagnosed with Fetal Alcohol Syndrome, Complex Post Traumatic Stress Disorder, and Attention Deficit Hyperactivity Disorder. He had obtained a Full Scale IQ score of 82 on the WISC-IV and was receiving special education services in reading, language arts, writing, and math. He was receiving modifications in the general education classroom for science, social studies, music and physical education. Andy was reported to have difficulties with impulse control and engaged in disruptive behavior across settings. Andy's difficulties with peers had lead the school to implement an adapted recess in which he took a separate recess time with two or three specially selected peers.

Setting. The study took place in a special education classroom in a public elementary school located in northern Illinois. During the part of the school day in which the study was conducted, Andy was in the classroom with eight other students in grades 4-6. Students were divided into small instructional groups, run by either the special education teacher or an instructional assistant, and each group focused on a different academic subject (i.e., math, reading, etc). Andy participated in a math group. All math group instruction was conducted by a paraprofessional and took place at a table in the special education classroom. Andy and 2-3 other students sat at the table across from the paraprofessional. Math group instruction was highly structured and delivered using a Direct Instruction math curriculum. Students

were provided with frequent opportunities for active responding, and received high rates of descriptive praise for behaving appropriately, following directions, and completing work. Prior to the beginning of the study, the teacher had developed and implemented a daily check-in/check-out point system for Andy. Andy could earn 0, 1, or 2 points during each class period throughout the day. He earned 0 points if he completed less than 80 percent of this work and engaged in more than two instances of targeted challenging behavior. One point was awarded if he completed at least 80 percent of this work and engaged in no more than two instances of challenging behavior. Andy could earn two points during a class period if he completed at least 80 percent of his work and had no instances of challenging behavior. At the beginning of each school day, the teacher gave Andy a point card and reviewed the expectations and the criteria for earning points. Andy also selected preferred items that he would work towards earning that day. Andy could exchange his points for these prizes two times each day. If he met the criteria for earning points in the morning, he could choose a preferred item before lunch; if he met the criteria for the afternoon, he could earn a preferred item during the last period of the day. This motivation system was in effect throughout all phases of the study.

Dependent Variables and Data Collection

Dependent measures. The dependent variables were time on-task and occurrence of disruptive behavior. Time on-task was defined as the percentage of intervals that Andy was oriented toward the appropriate math group activity (i.e., listening to teacher instruction, completing independent practice activities, etc.). Andy was considered to be on-task when he was: 1) following directions, 2) attending to the teacher or teacher requested tasks, 3) appropriately manipulating materials (pencil, workbook, etc.), and 4) quietly completing independent work. Andy was considered to be off-task if he was: 1) out of his seat without permission, 2) dancing and waving his arms around, or 3) waving a pencil in the air, and/or attempting to disassemble the pencil. Disruptive behavior was defined as talking without permission, blurting out, singing, or using inappropriate language (e.g., profanity, verbally teasing/insulting or threatening peers).

Data collection. On-task behavior data were collected using a momentary time-sampling procedure with 15-s intervals. At the end of each 15-s interval, the observer would indicate on a data sheet whether Andy was 'on-task' or 'off-task' when the timer went off. The percentage of intervals in which the student was on-task was calculated at the end of each observation. Data for disruptive behavior were collected

using partial interval recording with 15-s intervals. Using partial interval recording, any instance of disruptive behavior observed anytime during the 15-s interval resulted in occurrence of disruptive behavior being recorded for that interval. The percentage of intervals in which the student had engaged in disruptive behavior was calculated at the end of each observation.

All data collection took place during the regularly scheduled math group time in the special education classroom. Observations began at the start of math group and continued until the structured portion of math group ended and students in the group were permitted to have snacks and return to their desks to work on independent practice problems. The duration of each observation period was approximately 20-25 minutes. Observers sat off to the side of the math group table, close enough to see and hear the events taking place, but far enough away (i.e., approximately 8-10 feet away) so as not to be a distraction to the math group participants. A 'Timer' application on an iPod touch, set to go off at 15-s intervals. Observers wore an ear-phone in one ear to hear the tones, and recorded data using a paper-pencil data collection sheet.

Interobserver agreement. Prior to data collection, interobserver agreement was established by having both the primary observer and second observer observe Andy in the special education classroom using the agreed upon definitions of on-task and disruptive behavior. Each observer first coded data independently, and then any discrepancies were discussed until agreement was reached. This process was repeated until 100% agreement was achieved for each variable.

Interobserver reliability checks were completed for each variable for 25% of the observation sessions (4 out of 16), and were distributed across phases. Reliability was assessed by having a second observer sit in during math group using the same methods and materials as the primary data collector. During reliability checks, a second set of headphones was attached to the iPod Touch to allow both observers to hear the same tone to mark 15-s intervals. Interobserver reliability scores were computed using the following formula: number of agreements divided by the number of agreements plus disagreements, multiplied by 100. Mean interobserver agreement was 94% (range, 92-100) for time on task, and 91% (range, 88-100) for disruptive behavior. Both the primary (first author) and second (second author) observers' data are shown in the subsequent figures.

Procedures

Experimental design. A single-subject changing conditions (A-B-BC) design was used to assess the effects of video modeling and a

combination of video modeling and self-monitoring on Andy's on-task and disruptive behavior. This study included one phase of baseline (A), followed by one intervention phase of video modeling alone (B), and concluded with a second intervention phase where video modeling and student self-monitoring were used concurrently (BC).

Baseline. The baseline condition consisted of small group math instruction typical to the classroom. No changes were made to the content, routine, or structure of the math group. In baseline, the student was not presented with any type of video modeling and did not self-monitor any of his own behaviors. The pre-existing reinforcement system remained in place throughout all phases of the study.

Video modeling. Prior to beginning the video modeling phase, a short video sequence was recorded with two same-age peers serving as models. In the video, peers demonstrated appropriate math group behavior including on-task behavior, following directions, and completing work. As part of the video-editing process, a narration was added to the video that verbally described the behavioral expectations of math group while each expectation was demonstrated by the models. The narration included statements such as: "1) Keep your eyes on the white board when the teacher is showing you something. You should be watching and listening quietly, 2) Answer questions from the teacher in a normal, quiet voice. Speak loudly enough that the teacher can hear you, 3) Open your workbook to the correct page when teacher asks you to write the answer to a problem, 4) Listen to the teacher when she is talking. You should not be talking when the teacher is talking, 5) You do not need your pencil when the teacher is talking. You should keep your pencil on the table or give it to the teacher so that it does not distract you, and 6) If you have a question, raise your hand and wait for the teacher to help you." After all editing and narration was completed the video was loaded onto the iPod Touch that Andy would use. The final version of the video was 4 minutes in length.

At the beginning of the video modeling phase, the teacher explained to Andy that he would be watching a short video before math to help remind him of the expectations during math group. Each day during the video modeling phase, the teacher or paraprofessional would give Andy the iPod Touch approximately five minutes before math group. The paraprofessional would then prompt Andy to touch an icon on the iPod Touch to play the video. Andy would sit at the math group table and watch the video. The video was watched during transition time, therefore, other students generally did not arrive at the math table until Andy had finished, or nearly finished, watching the video. After the video concluded, Andy returned the iPod to

the paraprofessional, and math group began. This process continued daily throughout the intervention phases of the study.

Video modeling plus self-monitoring. Before video modeling and self-monitoring procedures were combined (BC phase), Andy was taught to differentiate between on-task and off-task behavior and to self-record his on/off-task behavior using a self-monitoring sheet. Training on self-monitoring procedures took place during three separate 15-minute sessions. Prior to the first session, a video recording was made of Andy during math group. The video was recorded before baseline data were collected and included images of Andy engaging in both on-task (Figure 1) and off-task (Figure 2) behavior. Images of on-task behavior included Andy sitting appropriately at the table, following the teachers directions, and working independently. Images of off-task behavior included Andy getting out of his seat, talking to or distracting peers during independent work time, destroying property (peeling the plastic cover off of his pencil, and standing up and dancing near his chair during work time). The recording was edited so that instances of on-task and off-task behavior appeared in a semi-random order with transitions between scenes. Each scene or sample of behavior lasted approximately 30 seconds. The final video included five examples of on-task behavior and five examples of off-task behavior arranged in semi-random order; no more than two examples of on-task behavior appeared in a sequence before a segment of off-task behavior appeared. The final video was five minutes in length. The video was loaded onto the iPod Touch, allowing Andy to view the training video on the portable hand held device. Training sessions were conducted in the special education classroom by the first and second authors.

In the first training session, Andy viewed the video of himself and was asked to identify whether he was "doing his work" (on-task) or "not doing his work" (off-task) at different points in the video. Andy responded to the questions verbally. A self-monitoring sheet was not yet used, since, in this initial session, the focus was on teaching Andy to identify and distinguish between his own on-task and off-task behavior. In this first session, Andy demonstrated the ability to correctly discriminate between his own on and off-task behavior. In the second training session, a self-monitoring sheet was introduced, and Andy was taught to record his behavior using the self-monitoring sheet (Figure 3). The 'Timer' application on the iPod Touch was used, and set to loop on 30-second intervals, to indicate when Andy should mark the self-monitoring sheet. Andy watched the video of himself in the math group setting, and was prompted to check the box for "doing my work" or "not doing my work" on the self-monitoring sheet



Figure 1. Example of image displayed on iPod Touch during video-modeling of on-task math group behavior.



Figure 2. Example of image displayed on iPod Touch during video-modeling of off-task math group behavior.

Am I doing my work?

Date: _____



Yes			No	
<input type="checkbox"/>		1	<input type="checkbox"/>	
<input type="checkbox"/>		2	<input type="checkbox"/>	
<input type="checkbox"/>		3	<input type="checkbox"/>	
<input type="checkbox"/>		4	<input type="checkbox"/>	
<input type="checkbox"/>		5	<input type="checkbox"/>	
<input type="checkbox"/>		6	<input type="checkbox"/>	
<input type="checkbox"/>		7	<input type="checkbox"/>	
<input type="checkbox"/>		8	<input type="checkbox"/>	
<input type="checkbox"/>		9	<input type="checkbox"/>	
<input type="checkbox"/>		10	<input type="checkbox"/>	

I have _____

Figure 3. Self-monitoring form used to monitor Andy's on-task behavior during small group math instruction.

when the timer went off. In this session, when verbally prompted to mark his sheet, Andy was able to use the self-monitoring sheet to accurately record on and off-task behavior. In the third training session, Andy watched the video and used the self-monitoring sheet to independently record whether he was on-task or off-task. By the end of the third training session, Andy was using the self-monitoring sheet to record his behavior on the training video, with 100% accuracy, without prompting. Upon completion of the three training sessions, the third phase of the study was implemented.

In the video modeling plus self-monitoring phase (BC phase), Andy was given the iPod Touch (with the timer set to loop on 2-min intervals) and the self-monitoring sheet each day at the start of math group. The iPod and the self-monitoring sheet were placed on the table next to his math workbook. When instruction began, Andy pushed the 'start' button to start the 2-min loops. Then, each time the timer went off Andy would indicate on the self-monitoring sheet whether he was on-task or off-task when the timer went off. This process continued until math group ended and students were sent back to their desks to work independently. Throughout this phase, Andy continued to watch the previously introduced video (on the iPod Touch) of peers depicting appropriate math group behavior prior to joining the math group.

Instrumentation

Two Apple 8GB iPod Touches were used for this study (one for the student, and one for the observer/data collector). Each iPod had 8GB of memory, weighed 4.2 oz, and retailed for \$199. One iPod Touch was used for multiple purposes throughout the study.

In the video modeling phase of the study, the student used an iPod Touch to view the 'math video', depicting proper math group behavior, every day prior to joining the math group. The math video was created using a Cannon ZR500 video camcorder to record video footage. Then, Pinnacle Studio (Avid Technology, Inc., © 2009-2010) video editing software was used to convert the video footage to an iPod Touch compatible format. After files were converted, the "Picture Scheduler" (Jankuj & Van Laarhoven, © 2008-2011) application was used to transfer the MP4 files to the iPod Touch. Picture Scheduler was downloaded from http://www.jankuj.com/Picture_Scheduler.html for \$2.99. Recording the video of peer models took approximately 45 minutes including reviewing the scenario with the students, briefly rehearsing the scenario, and making the recording. Twenty minutes of video was recorded with the peer models. This video file was transferred to a laptop computer and edited down to a file 4 minutes in

length. Editing the video with Pinnacle Studio, including, adding of voice narrations and scene transitions took approximately 30 minutes (excluding the 20 minutes required to transfer video files from the digital video camera to the computer). Transferring the MP4 file to the iPod touch and setting up a “thumbnail” icon with the Picture Scheduler application took an additional 5 minutes.

Prior to implementing self-monitoring, the student was taught to differentiate between on-task (“doing my work”) and off-task (“not doing my work”) behavior and to self-record his on/off-task behavior using a self-monitoring sheet. During these training sessions, the iPod Touch was used to show the student video clips of himself engaged in both on-task (Figure 1) and off-task (Figure 2) behavior. The video used in training sessions was 4 minutes long. The student would then identify whether he was on or off-task at various points in the video. Pinnacle Studio video-editing software was also used to create the self-monitoring video.

Finally, in the video modeling plus self-monitoring phase, the “Timer” application (Bonnin, 2008) for the iPod Touch was used to prompt the student to self-record on/off-task behavior at 2min intervals. Using the Timer application, the timer can be looped, so that the timer continuously goes off after a specific amount of time has passed. In this case, the loop was set for 2 minutes, and the end of each loop was indicated by a “soft gong” sound. The Timer application (version 2.3, by Francis Bonnin) was downloaded from the iTunes App Store for \$0.99.

Results

The results of this study show that the student responded positively to both the video modeling intervention and the combination of video modeling and self-monitoring compared to the baseline condition (Figure 4). As evident by the graph, implementation of video modeling was followed by an immediate positive change in the level of on-task behavior and occurrence of disruptive behavior. However, despite clear improvement on both dependent measures, Andy’s performance remained fairly inconsistent. After implementation of video modeling plus self-monitoring, Andy consistently displayed very high rates of on-task behavior and low rates of disruptive behavior. Andy’s mean percentage of intervals on-task was 44% (range = 31 to 52) in baseline, 81% (range = 57 to 98) with video modeling alone, and 99% (range = 98 to 100) with video modeling and self-monitoring combined. Mean percentage of intervals engaged in disruptive behavior was 40% in baseline (range = 36 to 45), 11% with video modeling alone (range = 2 to 34), and 0% (range = 0) with video modeling and

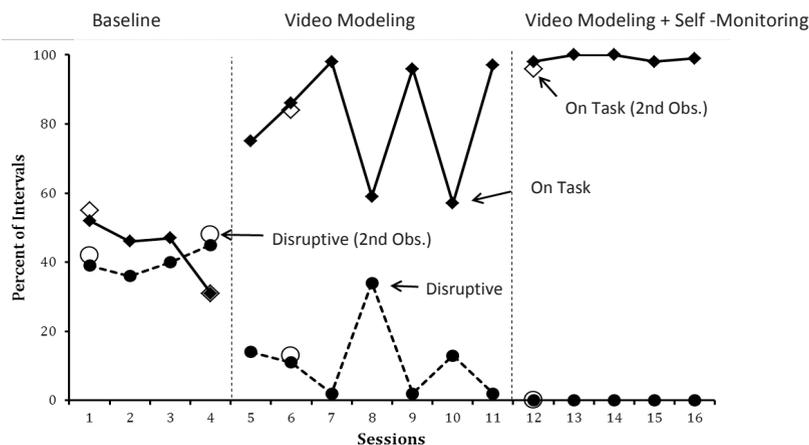


Figure 4. Percent of intervals Andy was on-task and engaging in disruptive behavior.

self-monitoring combined. The second observer’s data showed the same pattern of responding as recorded by the primary observer.

The percentage of nonoverlapping points (PND) (Scruggs, 1987) between baseline and the video modeling phase was 100% for on-task behavior and 85.7% for disruptive behavior. The PND between baseline and the video modeling plus self-monitoring phase was 100% for both on-task and disruptive behavior. Scruggs and Mastorpiери (2001) have suggested that a PND score of 90% is considered highly effective while a score between 70-90% is moderately effective.

Discussion

In this study, the use of video modeling, delivered on an iPod Touch, had a positive impact on a student’s on-task and disruptive behavior during small group math instruction. The effectiveness of video modeling appears to have been enhanced with the addition of self-monitoring procedures. Based on the guidelines suggested by Scruggs and Mastorpiери (2001), the percentage of nonoverlapping data points indicates that the video modeling intervention was moderately effective for reducing Andy’s disruptive behavior and highly effective in increasing his level of on-task behavior. When self-monitoring was introduced in the next phase, the percentage of nonoverlapping data points suggests that the combined intervention was highly effective for both dependent measures. The effectiveness of the video modeling

intervention is also supported by the immediacy of the change in the level of Andy's on-task and disruptive behavior as independently recorded by two observers when the video modeling procedure was implemented. In addition, a change in trend was observed in Andy's disruptive behavior; there was an ascending trend in the last three data points in baseline and an ascending trend in the first three data points of the video modeling phase. The video modeling plus self-monitoring phase was associated with decreased variability and further improvements in both Andy's on-task and disruptive behavior.

The results of this study support previous findings revealing positive effects on aggressive, inappropriate, and off-task behavior associated with the use of video modeling and self-monitoring procedures (Baker et al., 2009; Carr & Punzo, 1993; Embregts, 2000, 2002; Kern & Dunlap, 1994). In addition, this study extends previous research in many ways. First, in contrast to earlier research, this study introduced the use of an iPod Touch as the means for delivering video-based instruction for a student with emotional/behavioral difficulties, as well as to facilitate student self-monitoring and data collection procedures. Video modeling typically takes place in front of a television or desktop computer screen. While fairly easy to implement, conducting video modeling in this manner still requires setting aside time and space within the classroom for the student to view the video. Implementation of video modeling on a handheld device, such as an iPod Touch, allows video-based instruction to be delivered in a less intrusive manner. Using an iPod Touch, a student could quietly view a video from his/her desk without interrupting classroom instruction or calling undue attention to the fact that individualized video-based instruction is occurring. Use of an iPod Touch also presents a more portable option for delivery of video-based instruction, allowing a student to view a video from a variety of locations including the classroom, hallway, lunchroom, playground, school bus, or community settings. Similar benefits were noted anecdotally when using the iPod to teach Andy to self-monitor his behavior. During training sessions, Andy was able to view video clips on the iPod and self-evaluate his behavior to determine if he was on or off-task. Later, the 'Timer' application on the iPod simplified the self-monitoring process by serving as a small, portable timing device cuing Andy to mark his self-monitoring form. Thus, findings of this study indicate that using an iPod Touch to deliver video-based instruction within the classroom setting is not only effective, but might also be an easier and more practical means of delivery than the less portable methods used previously.

It is possible that some negative consequences could result from using hand held technology for self-monitoring purposes during class

instruction. For example, use of the iPod during instruction might be distracting to the target student or disruptive to classroom instruction as the student interacts with the iPod, or, the presence of the technology itself might be distracting to a student or to peers nearby. However, while use of the this type of technology for self-monitoring purposes has the potential to be distracting, and/or disruptive to the classroom environment, in Andy's case, and in Andy's classroom environment, these negative consequences did not seem to occur. Observation and anecdotal information obtained from the teacher and paraprofessional indicated that Andy demonstrated the ability to attend to the math lesson while also marking his self-monitoring sheet every 2 minutes when the iPod timer indicated it was time to do so. Plus, according to Andy's percent of intervals on-task during intervention phases, Andy may have been less distracted when the technology was in use compared to when it was not. The volume of the tone/timer was also set low enough that, although audible enough to catch Andy's attention, it did not seem to cause other students to become distracted, nor did it appear to interrupt their learning.

The teacher was asked to respond to a brief questionnaire related to the perceived effectiveness and acceptability of the video modeling and self-monitoring interventions implemented in her classroom. Table 1 shows her response to each item. When asked to rate the perceived effectiveness of video modeling and self-monitoring independently, she gave a higher effectiveness rating to self-monitoring. However, when asked to rate the extent to which the intervention package met the needs of her student, she gave a rating of 6 out of 7. Her ratings suggest that she perceived the intervention package as successfully improving the behavior of her student, but she attributed more of the success to self-monitoring than to video modeling. When asked about her lower rating of video modeling, she indicated that she felt Andy became bored with the video after he was asked to watch it several times. Her perception was that he did not take the video modeling seriously and she suggested that the intervention might have been more effective if he had watched the video less frequently. When asked to rate the likelihood that she would use video modeling or self-monitoring again in the future, she gave a rating of 6 out of 7 for both interventions, indicating that she would be very likely to use these interventions again in the future.

It is interesting that the teacher gave video modeling an effectiveness rating of 3 out of 7 when the data indicate this intervention was associated with immediate and significant improvements in Andy's on-task and disruptive behavior. It is possible that her perceptions of Andy appearing bored with the video may have influenced

Table 1
Teacher Ratings of the Effectiveness and Acceptability of the Video Modeling and Self-Monitoring Interventions.

	Question	Rating Anchors	Teacher Rating
1.	How well did the video modeling and self-monitoring procedures meet the needs of student?	1 = Poor; 7 =Excellent	6
2.	How costly (in terms of resources) was it to carry out the video modeling procedure?	1= Not costly; 7 = Very Costly	3
3.	How costly (in terms of resources) was it to carry out the self-monitoring procedure?	1= Not costly; 7 = Very Costly	3
4.	How likely is video modeling to make permanent improvements in learning for the students?	1= Very unlikely; 7 = Very Likely	5
5.	How likely is self- monitoring to make permanent improvements in learning for the students?	1= Very unlikely; 7 = Very Likely	5
6.	How likely is it that you would use video modeling again?	1= Very unlikely; 7 = Very Likely	6
7.	How likely is it that you would use self-monitoring again?	1= Very unlikely; 7 = Very Likely	6
8.	How disruptive were these interventions to ongoing classroom instruction?	1= Not disruptive; 7 = Very disruptive	4
9.	How effective was video modeling?	1= Not effective; 7 =Very effective	3
10.	How effective was self-monitoring?	1= Not effective; 7 =Very effective	5
11.	How serious were the learning problems of the students participating in the study compared to other students in the class?	1 = Not serious; 7 =Very serious	6

her perceptions of the intervention's effectiveness regardless of the measured changes in his behavior. It is also possible that the variability of his behavior in this phase led to her perception that video modeling was less effective; during two of the seven sessions of the video modeling phase, his on-task behavior was only slightly higher than recorded in baseline. Finally, the teacher's perceptions of the intervention may have been influenced by Andy's behavior outside of the math group. The video modeling and self-monitoring interventions associated with this study were limited to the math group. The peer models and self-modeling instruction videos were made up of examples that were associated with the math group and the intervention was only implemented in that very specific situation. Even while he was engaging in on-task behavior for 100 percent of the intervals with 0 incidents of disruptive behavior in the last phase of the study, he continued to display challenging behaviors at other times during the day.

In a recent review of literature involving video modeling and students with EBD, Baker et al. (2009) noted that although some (Esveldt, Dawson, & Forness, 1974) have speculated that video modeling implemented as a single intervention (i.e., without additional components such as reinforcement or discussion of the video) may not be as effective as video modeling used in combination with other strategies, no research currently exists to support that claim. In past research investigating effects of video modeling with students with EBD, video modeling procedures have been included as part of an intervention package, making it difficult to determine whether effects found can be contributed solely to video modeling procedures (Baker et al., 2009). A contribution of this study is that it provides evidence in support of the notion that video modeling may be more effective when used in conjunction with self-monitoring and a general reinforcement system. In the video modeling phase (B phase) of this study, implementation of video modeling was the only change in condition from baseline, thus isolating video modeling as the only intervention in place. In the video modeling only phase of the study, Andy viewed the video prior to math instruction. No discussion of the video occurred, and Andy continued to be reinforced for appropriate behavior according to the preexisting system operating within the classroom. The student showed marked improvement with video modeling alone compared to baseline. However, his performance of target skills varied considerably from day to day. It was only after self-monitoring procedures were combined with video modeling that performance of target skills reached a more consistent level. Given that Andy showed success with video modeling, and that introducing multiple intervention

components (i.e., an intervention package) might decrease an intervention's acceptability and practicality for some teachers (Baker et al., 2009), these results indicate that video modeling used alone, could present a feasible means for addressing problem behavior in classroom settings. Overall, findings of this study suggest that video modeling used as a single intervention could be an effective classroom intervention for some students; however, additional components might be necessary in order to obtain optimum results.

While the findings of this pilot study are promising, several limitations should be noted. This study involved single subject methodology and included only one student. Thus, replication with additional students in multiple settings is necessary in order to demonstrate effectiveness of the intervention and to replicate the findings reported here.

Also, in the second intervention phase of this study (BC phase), video modeling and self-monitoring procedures were implemented concurrently. Consequently, it is not possible to determine what effects self-monitoring alone might have had on Andy's on-task and disruptive behavior during math group. In future investigations perhaps self-monitoring could be implemented in a separate phase, in order to be able to differentiate between effects of video modeling alone, self-monitoring alone, and self-monitoring used in combination with video modeling. In addition, the chosen design (A-B-BC) is another limitation of this study. In the A-B-BC design implemented, there was only one phase of baseline (A), followed by an intervention phase (B) consisting of video modeling only, and then a second intervention phase (BC) that combined video modeling and self-monitoring. This type of design does not allow for demonstration of a functional relationship between the independent and dependent variables, and does not control for potential confounding variables, such as sequence effects or maturation effects, which could have affected the findings of this study. Therefore, based on the design, we cannot confirm that the interventions used were solely, or directly, responsible for the changes in Andy's on-task and disruptive behavior. Finally, in the present study all videos were created, edited, and downloaded to the iPod Touch by researchers, not by school staff. Future research should look at the classroom feasibility and suitability of this type of intervention when implemented solely by the classroom teacher. Interventions involving video-based instruction and other forms of technology will only be useful if those implementing such interventions feel confident in their ability to do so.

In sum, the present study involved teaching a student exhibiting frequent off-task and disruptive behavior during small group

instruction to use an iPod Touch for video modeling and self-monitoring purposes. Results suggest that both video modeling and a combination of video modeling plus self-monitoring had a positive effect on the student's target behaviors in a small group setting. Further research is needed regarding video modeling procedures and students with EBD, yet, these findings suggest that video modeling and self-monitoring delivered on a hand held device, such as an iPod Touch, represent a promising new method of delivering effective classroom-based interventions for students with emotional/behavioral difficulties.

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