Examining Self-Monitoring Interventions for Academic Support of Students with Emotional and Behavioral Disorders

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Abstract

Researchers have found that English teachers in the United States of America (USA) perceive providing writing instruction to students with emotional behavioral disorders (EBD) as a difficult task. This could be associated with the fact that students with EBD often work below skill level in the content area of writing compared to same age peers. Researchers continue to investigate interventions to increase academic outcomes for students with EBD. Utilizing a single case design, three middle school students with EBD were observed in a self-contained classroom to determine the effects of a traditional and technology based self-monitoring intervention focused on decreasing student off-task behaviors while increasing scores on writing assignments. The study took place in an urban school district within the Southeastern region of the USA. Results indicated that the first two intervention phases were equally as effective at reducing off-task behaviors. Additionally, the third intervention phase led to decreased off-task behaviors and increased writing scores for all students compared to the previous two phases. Social validity assessments indicated that the self-monitoring interventions were useful and relevant for teachers and students with EBD in the self-contained setting. Implications for teachers and educational researchers are discussed within this article.

Key Words: Self-Monitoring, iPod, EBD, off-task behavior, technology, written expression

In general, social and emotional factors play an important role in the academic success of all students (Gumora & Arsenio, 2002). For instance, pro-social behaviors, (e.g., helping, sharing, and volunteering), supportive interpersonal environments, and academic performance have been shown to often exhibit positive relationships with each other (Kiuru, et al., 2014; Shepherd & Linn, 2015; Wentzel & Wigfield, 1998). Moreover, a student's emotional disposition and ability to regulate their emotions have been shown to be significant predictors of grade point average (GPA; Gumora & Arsenio, 2002).

Educators worldwide face the challenge of educating students with emotional and behavioral disorders (EBD) (De Jong, 2005; Gulchak & Lopes, 2007; Head, Kane, & Cogan, 2003). Although there are noted differences in the identification of students with EBD in Western and Non-Western countries, students that exhibit maladaptive behavior that impedes peers or their own academic progress are in the need of educational supports (Chakraborti-Ghosh, Mofield, & Orellana, 2010). For instance, in Burundi, located within Eastern Africa, researchers report that there is a countrywide need to provide support for educators working with students with Post Traumatic Stress Disorders (PTSD) that exhibit aggressive anti-social behaviors and difficulty with interpersonal relationships, characteristics of students with EBD (Crombach & Elbert, 2014). The difficulties students with EBD experience related to displaying pro-social behaviors and developing positive relationships with adults often proves most challenging for educators as these difficulties impact students' task engagement (Shepherd & Linn, 2015). In the United States, students with EBD, by definition, have difficulty with displaying pro-social behavioral skills (Reid, Gonzales, Nordness, Trout, & Epstein, 2004; Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008). When compared to typically developing students, students with EBD frequently displayed low levels of task engagement and completion (Nelson, Benner, Lane, & Smith, 2004). Consequently, students who have experienced trauma and students with EBD in general are often ill equipped to meet the social, behavioral, and/or academic demands of school (Lane, Carter, Common, & Jordan, 2012).

Students with EBD struggle within the content area of writing and often work below skill level (Lane, 2004; Nelson et al., 2004; Regan, Mastropieri, & Scruggs, 2005). Streeck-Fischer and van der Kolk (2000) noted that tasks involving memory and concentration can be negatively affected by experiencing trauma and specifically identifies math, physics, and grammar as being particular areas of difficulty for such students. Additionally, educators perceive providing writing instruction to students with EBD as one of the more difficult areas of academic instruction to impart. Indeed, a study by Casey, Williamson, Black, and Casey (2014) found that 368 out of 511 (72.1%) secondary English teachers surveyed from across the United States reported difficulty teaching writing to students with EBD as compared to other disabilities within an inclusive classroom. Academic and behavioral interventions are needed for students with EBD in content areas such as writing.

Self-Monitoring

The use of self-management interventions has been found to increase academic engagement for students with EBD during writing activities (Mooney, Ryan, Uhing, Reid, & Epstein, 2005) while also changing educator perspectives related to the struggles of teaching written expression to this population of students (Sutherland et al., 2008). Self-management interventions are similar in nature to self-regulation strategies and are typically made up of five components: self-monitoring, self-evaluation, self-instruction, goal-setting, and strategy instruction (Mace, Belfiore, & Hutchinson, 2001). Self-monitoring involves students observing their own behaviors and using a data collection system to independently record their behavior (Alberto & Troutman, 2013; Rafferty, 2010). Self-monitoring can be implemented using a variety of methods including those considered more traditional, such as a paper-based method, or another option such as the use of handheld devices including iPods or cell phones (Bedesem, 2012; Blood, Johnson, Ridenour, Simmons, & Couch, 2011). Literature is replete with examples of handheld devices such as iPods, iPads, and cell phones being used to help students in P-12 settings successfully self-monitor their behaviors (e.g., Ayres, Mechling, & Sansosti, 2013; Bedesem, 2012; Gulchak, 2008; Johnson, Blood, Freeman, & Simmons, 2013; Mechling, 2007). Handheld devices are portable, easy to use, socially acceptable, and students are motivated to use them (Bauer & Ulrich, 2002). For example, Blood and colleagues (2011) investigated the use of an iPod Touch for video modeling including a self-monitoring component in an elementary setting that included students with EBD. The findings demonstrated that the two components positively impacted the target student's on-task behavior and reduced disruptive behavior.

Self-Monitoring and EBD

There is a research base that exists regarding methods of behavioral and academic supports to assist students with, or at-risk of, EBD to succeed in school settings (e.g., Lane, 2007; Lane, Gresham, & O'Shaughnessy, 2002; Lane, Wehby, & Barton-Arwood, 2005). Functional relationships between environmental events that lead to maladaptive behaviors thus decreasing task engagement and ultimately lowering academic achievement remain well studied (Menzies & Lane, 2011). However, there is limited research investigating any connections between a student's emotional state prior to exhibiting disruptive behaviors and

how self-regulation of such an emotional state may influence task engagement and ultimately student academic outcomes. In other words, the role of the immediate external events preceding maladaptive behavior is well documented in the literature, but the role that the internal state may serve as a setting event leading up to the contiguous environmental trigger remains limited.

Setting events, such as emotional states (e.g., anger, worriedness, or sadness), are often overlooked in the literature due to the temporal distance between the overt behavior exhibited by the student in the classroom and the event that may have occurred in the distant or recent past (Alberto & Troutman, 2013). This is particularly the case when teaching children labeled as having EBD as a result of past traumatic events (Crombach & Elbert, 2014). One study by Gumora and Arsenio (2002) found that a student's ability to regulate his or her emotions was a predictor of student GPA's. However, there is limited research investigating the connection between a student's emotional state to the student's observable behavior and academic engagement. As a result, potential studies that look at the impact of emotion regulation on task engagement and academic performance of students with EBD will further assist teachers in providing interventions or accommodations within classroom settings.

Purpose of the Study

This study sought to look at the impact of emotion regulation on task engagement and academic performance of students with EBD. Specifically, the research question examines the impact of several self-monitoring interventions on the academic scores and off-task behavior of students with EBD. The authors hypothesize that handheld devices that help students identify their affective state may impact student engagement differently than a traditional paper and pencil method. This belief is based upon the result of literature on the use of handheld technology devices in support of international student academic engagement. The use of handheld technology devices has been shown to be an effective means of efficiency with meeting complex language and communication needs of linguistically diverse students (Coe & Oakhill, 2011; Kemp & Bushnell, 2011; Peng & Chou, 2007). Such devices ability to translate between native languages and/or the ability to utilize video or pictorial representations of ideas has been shown to be one efficient way of transmitting information to and from students that do not speak the predominant language of the educating country (Liu, Navarrete & Wivagg, 2014). For these reasons, it is useful to examine the use of picture based mobile applications in addition to traditional methods of instruction/intervention because these technologies can be used by an ever-increasing diversity of student languages and nationalities in diverse educational environments.

METHOD

Participants

Teacher. Ms. Smith (pseudonym) was the teacher participant of this study. Ms. Smith was in her 5th year of teaching and held a Special Education Modified K-12 Professional License. She received training on self-management strategies, including self-monitoring, during a previous professional development session from the school district.

Students. Initially, a total of five middle school students agreed to participate in the study; however, one student transferred to another school, and one student went on a lengthy family vacation shortly after the start of the study. Thus, three students (names are pseudonyms) were included in the study. Each student indicated willingness to participate via written assent. Appropriate Institutional Review Board (IRB) approval at the authors' institution was obtained as well as parent/guardian consent for the students' participation.

Prior to the start of the study, the teacher reported that the Kaufman Test of Educational Achievement, Second Edition (KTEA-II; Kaufman & Kaufman, 2004) was administered at the beginning of school year to all students. The KTEA-II was administered one month prior to the study. Based upon the results of the KTEA-II, each of the student participants' demonstrated difficulty with mastering standards associated with the content area of writing. Specifically, the results indicated that the students' written expression norm scores were lowest among all content areas assessed by the KTEA-II. Furthermore, the teacher provided anecdotal data indicating that the students displayed frustration and off-task behaviors such as talking-out and engaging in irrelevant activities when attempting to complete a writing assignment. Based upon the anecdotal data and results from the KTEA-II, the teacher and the authors determined the content area of writing (written expression) – specifically, writing mechanics (a sub-skill of written expression) - would be the focus of the self-monitoring activity during this study. Table 1 lists demographic information and the grade-level equivalent scores for each student in the area of written expression based on their individual KTEA-II results.

Setting

This study occurred in a multi-grade (6th, 7th, & 8th) self-contained classroom that contained five students. The school was located in an urban district within a large Southeastern city within the USA. Seventy-five percent of the students received free or reduced lunch, and approximately 16% of the student population received special education services. Approximately 57% of the student population were Black, 22% were White, 15% were Hispanic, and 6% identified as "other."

Table 1
Participant Characteristics

Name	Gender/Age	Grade	Race Category	Disability	KTEA-II Results (Grade Level)
Sherry	Female/13	8th	AA	EBD/OHI	1.8
Jackson	Male/12	6th	W	EBD/Autism	1.6
Tim	Male/14	6th	W	EBD	2.9
* KTEA-II Average					2.1

Note. AA = African American; W=White, EBD = Emotional/Behavioral Disorder, OHI-Other Health Impairment
Kaufman Test of Educational Achievement, Second Edition (KETA-II), Written Expression

The classroom was organized into three rows, seating three desks per row. The teacher conducted her daily lessons at both an interactive large electronic white board on the right side of the room and a dry erase board in the front of the room. The teacher's desk was located on the left side of the room where she frequently observed students during independent seatwork. Based upon the teacher's daily schedule, written expression activities were approximately 30 minutes in length and were provided each morning.

Variables

Dependent variables. The dependent variables evaluated in this study included: 1) off-task behavior, and 2) the number of correct responses on written expression activities (written expression scores). Off-task behaviors were operationally defined in a similar manner to Lee, Sugai, and Horner (1999) and included pausing, sleeping, looking around, absent from conversation with peers during instructional activity, and/or engaging in irrelevant activities (e.g. drawing).

During each observation period, students completed a written expression activity that consisted of three paragraphs in which the students were asked to correct 20 possible spelling, grammatical, or punctuation errors. Written expression scores were converted to a percentage score for each student by dividing the number of errors corrected by the number of errors possible and multiplying by 100.

Independent variables. Three self-monitoring interventions were evaluated to determine which was more effective in helping students identify their affective state, decrease their off-task behavior, and improve their academic engagement on a writing task. The first intervention consisted of a traditional paper/pencil method (PP) where the students recorded their affective state (i.e., how they felt) prior to and during the observed writing activity (e.g., happy, angry, sad, frustrated, or tired) on self-recording sheets provided by the teacher. The second intervention was the use of an Apple iPod Touch© device (iPod) that featured the use of an app called My Mood Tracker© while offering more affective state options that were pictorially based. The third intervention was a reintroduction of the PP intervention with the addition of the classroom teacher, Ms. Smith, providing one scripted verbal prompt (PP-Prompt) to each student reminding them to focus on the critical aspects of the assignments (e.g., capitalization and punctuation) before the assignment began.

Experimental Design

A single case A-B-C-D design (Alberto & Troutman, 2013), with D being an enhanced phase of B, was used to analyze the effects of three self-monitoring interventions on the dependent variables. This single case design was used as opposed to an alternating treatment single case design to ensure that the students learned how to use and had the opportunity to become familiar with each self-monitoring intervention. Furthermore, the single case A-B-C-D design allowed for the evaluation of the three different phases, decreased student confusion that may have potentially occurred with rapid switching of phases, and allowed the authors to systematically observe the data.

Data Recording

The off-task behaviors of each student were measured by the first and second authors using 20-second momentary time sampling during the 30-minute observation sessions (Alberto & Troutman, 2013). Using a smartphone device, the authors were prompted every 20-seconds to observe the target students and determine whether the students were demonstrating any one or more of the operationally defined off-task behaviors at the moment of sampling. Student off-task behavior was recorded using a paper/pencil data system during baseline and all three intervention phases (i.e., PP, iPod, PP-Prompt). In addition, each student's overall written expression activity scores were calculated after each observation session during each of the three intervention phases.

Materials

Daily writing activities. Identifying errors within a paragraph passage represents one of the components assessed by the written expression subtest of the KTEA-II.

Figure 1*Screen shot of the My Mood Tracker© app

Therefore, the lesson provided and assigned work during the observed self-monitoring sessions consisted of identifying errors within paragraph passages in a similar format to the KTEA-II. This activity was used during all phases of this study. The teacher used a paperback book titled *Daily Paragraph Editing, Grade 6* (Foster & Norris, 2004) to provide all writing activities. The school's curriculum coordinator determined that the written expression passages were at a 6th grade skill level and deemed the material appropriate for instruction. Using the KTEA-II results and teacher graded material, the teacher also deemed the material appropriate for instruction even though two of the participants were in grades higher than the 6th grade. In addition, the curriculum coordinator confirmed that all written expression activities had the same format and grade equivalent difficulty level for all recorded trials during the baseline and intervention phases. The lead investigator developed written self-monitoring sheets for the intervention phases within the study.

Technology. Apple iPod Touch© devices were provided for the students during the study by the authors. Each iPod Touch© device was equipped with an app called My Mood Tracker© which was used for student self-monitoring during the intervention. The classroom teacher kept the devices in a locked location within the classroom, distributed and collected the devices during the days that featured the iPod intervention. The authors provided 30-minute training for the teacher and the students prior to the study. A screen shot of the My Mood Tracker© app is provided in Figure 1. This app enabled participants to select an emoticon (selection from 12 emoticons with labels indicating emotion) to indicate how they felt during the observed writing activity.

Procedure

Baseline. Prior to the beginning of data collection, the authors spent four 30-minute periods in the classroom to help control for the potential of novelty and reactivity effects (Haydon, Mancil, & Van Loan, 2009). During the baseline phase, the teacher provided scripted instruction to the participants before they began their writing activity (e.g., pre-activity). Using an interactive large electronic white board, the teacher reviewed an example paragraph and identified spelling, grammatical, punctuation errors, and non-errors within a sample paragraph. After the teacher provided the example paragraph, the students completed the written expression activity, in which they had to correct 20 possible spelling, grammatical, and punctuation errors within three paragraphs individually at their desk.

Teacher training. Due to similar emoticon features in each intervention phase, the authors trained the teacher and students on the emoticons that were provided on paper and used on the iPod. Training for the paper-based emoticons consisted of identifying the physical state that each icon represented and ensuring that teacher and each student were in agreement with match. A similar training occurred for the iPod; in addition, the teacher and students were also trained how to operate (e.g., turn on/off, switch screens, open apps, select emoticons) the iPod Touch© devices. Finally, students were instructed that if in any phase they identified their current affective state as 'frustrated' that s/he could use the self-calming strategies located in the students Individualized Education Program (IEP) for de-escalation. The use of self-calming strategies was appropriate for this study as students had demonstrated frustration with writing activities prior to the study. As such, the authors agreed to include this as an option for students in this study. Some examples of the individual self-calming activities included: taking deep breaths for 1-2 minutes, requesting a 3-minute break at their desk, drawing, and asking for a 1-minute walk with an available staff member.

Paper/pencil (PP) phase. During the PP phase, the teacher provided the scripted pre-activity introduction to the lesson as she did within the baseline phase. In addition, she reminded students to record their moods (e.g., happy, angry, sad, frustrated, or tired) on the self-recording sheet placed on their desks. Students were instructed to record their moods on their sheets when the virtual timer, located on the corner of the interactive large electronic white board and in view of all students, indicated it was time to begin. The virtual timer was set up in 5-minute intervals and at the end of each interval it visually displayed '00:00' and a bell sound occurred. The students recorded their affect on the self-recording sheet prior to starting the timer for the first time and then every 5 minutes thereafter. Students were instructed to note if their affect was 'angry' or

'frustrated'. In such cases, students were instructed to follow pre-set instructions provided by the teacher in concert with stationary self-calming activities noted in their applicable behavior management plan. These techniques were taped to their desk during this intervention phase for easy access and procedural recall should the student self-submit a heightened affective state. Students completed the written expression activity, in which they had to correct 20 possible spelling, grammatical, and punctuation errors within three paragraphs individually at their desk.

iPod phase (iPod). During the iPod Touch phase, the teacher provided the scripted pre-activity introduction. Additionally, the teacher distributed the iPod Touch© devices to each student and ensured that the devices were switched to the on position and opened to the 'My Mood Tracker©' app. The iPod Touch© devices were set up to automatically prompt each student to record their mood at 5-minute intervals by selecting an emoticon. Students recorded how they felt by selecting (touching the iPod screen) one of 12 possible emoticons (e.g., happy, angry, sad, frustrated, tired, etc.; see Figure 1). Students were instructed to note if their mood was represented in the color yellow or red. In the event that students selected a red emoticon (e.g., angry, sad, frustrated, etc.), they were asked to follow pre-set instructions provided by the teacher in concert with stationary self-calming activities noted in their applicable behavior management plan. These techniques were taped to their desks for easy access and procedural recall should the student self-submit a heightened affective state. The students completed the written expression activity, in which they had to correct 20 possible spelling, grammatical, and punctuation errors within three paragraphs individually at their desk.

Paper/pencil with Prompt Phase (PP-Prompt). During the PP-Prompt phase, the teacher followed the same procedures as in the PP phase with the exception that she provided each student with a reminder verbal prompt to focus on aspects such as capitalization and punctuation during the writing assignment. In addition, students were provided with an opportunity to ask the teacher to restate the verbal prompt if they did not understand it initially. The rationale for returning to the PP phase and adding a prompt was a teacher decision related to her desire to see if a prompt would have a greater impact on the students' writing scores as the off-task behaviors were successfully being decreased by the self-monitoring intervention.

Social Validity

Social validity can be defined as the participants' overall approval of the intervention; specifically, the social importance and acceptability of treatment goals, procedures, and outcomes (Foster & Mash, 1999). The teacher and the students were asked to complete a social validity survey immediately after the conclusion of the study to obtain information about treatment procedures and intervention outcomes. The teacher completed the Intervention Rating Profile-15 (Witt & Elliott, 1985). Using this survey, the teacher rated questions using a 6-point Likert scale, where the numeral one represented "strongly disagree" and six represented "strongly agree." In addition, the students completed an adapted version of the Children's Intervention Rating Profile (Witt & Elliot, 1985). Using this survey, the students rated six questions using a 6-point Likert scale where the numeral one represented "I agree" and six represented "I do not agree."

Inter-Observer Agreement

Inter-observer agreement (IOA) data were collected for 33% of the sessions for each phase of the study (Kennedy, 2005). The first author served as the secondary data collector, and the second author served as the primary data collector during all intervention phases. To ensure reliability, data were collected on the IOA associated with each dependent variable, and IOA levels met the minimum standard of 80% agreement among observers within the study (Horner et al, 2005). IOA for student off-task behavior was calculated using interval agreement (dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100%). Written expression scores were calculated using the total agreement formula and the unit of measurement was percentage correct. Average IOA for student off-task behavior was 95.25% (range = 90-98%) across intervention phases and agreement for levels for the accuracy of correct and incorrect responses for the written expression activities was 100%.

Treatment Integrity

Treatment integrity refers to the extent that the treatment was implemented as intended (Vermilyea, Barlow, & O'Brien, 1984). Treatment integrity data were collected on the teacher to ensure she completed the instructional sequence for each intervention phase. Three different treatment procedural checklists were developed for each intervention phase to ensure treatment integrity (Haydon, Maheady, & Hunter, 2010). Treatment integrity data indicated that the teacher implemented all procedural steps with 100% adherence during each observation session. Treatment integrity recorded by the authors during each observation session resulted in 100% agreement and adherence to the prescribed intervention instructions.

RESULTS

A summary of the means for the percentage of the off-task behavior and written expression scores is presented for each participant within this section. Results varied by student; however, each student experienced a general decrease in off-task behavior between baseline and the three intervention phases. Additionally, the percentage of correct responses on the writing activity increased between baseline

Table 2

Student Percentages for Off-task Behavior and Writing Scores in Each Condition

Student	Baseline		PP		iPod		PP- Prompt	
	Off-task M (Range)	Writing M (Range)	Off-task M (Range)	Writing M (Range)	Off-task M (Range)	Writing M (Range)	Off-task M (Range)	Writing M (Range)
Sherry	16.75 (12-23)	56.25 (75-30)	8.25 (17-5)	62.5 (30-90)	5.8 (14-0)	45 (20-65)	0 (0-0)	76.25 (75-80)
Jackson	69.75 (43-91)	42.5 (20-50)	22 (35-16)	48.75 (35-65)	15 (22-4)	48.75 (45-50)	10.25 (14-5)	77.5 (70-90)
Tim	29 (22-37)	52.5 (60-50)	3.6 (12-0)	46 (25-85)	4.25 (5-0)	50 (40-70)	0 (0-0)	63.75 (60-70)
Total mean score	38.5	50.4	11.2	52.4	8.3	47.9	3.4	72.5

Note. M = Mean

and the intervention phases for each student. It is important to note that information in regard to the students using their self-calming sheet was not recorded. Table 2 displays the percentage of off-task behaviors and writing scores for each student across baseline and intervention phases.

Sherry

Off-task behavior. During the baseline phase, Sherry (pseudonym) was off-task an average of 16.75% of the time and showed an increasing off-task trend. During the PP phase, Sherry's off-task behaviors reduced as she was observed to be off-task for an average of 8.25% of the time. Sherry's off-task behaviors were further reduced during the iPod phase where she was observed to be off-task for an average of 5.8% of the time and decreased to 0% in the PP-Prompt phase. In all three phases, Sherry's off-task trend lines were decreasing overall. Figure 2 displays the percentage of off-task behaviors for each student across intervention phases.

Written expression scores. Regarding percent of correct responses on the writing tasks presented, Sherry achieved an average of 56.25% correct responses during baseline phases. During the PP phase, her percent of correct responses on the writing tasks increased to an average of 62.5%, but decreased to an average of 45% during the iPod phase. In the PP-Prompt phase, Sherry scored an average of 76.25%. Percent correct trend lines indicated that during baseline phases, Sherry's overall percent correct responses on the writing tasks were decreasing while the percent correct responses increased over time during the intervention phases of the study.

Jackson

Off-task behavior. During the baseline phase, Jackson (pseudonym) was off-task for an average of 69.75% of the time. During the PP phase, Jackson's average decreased to 22% and he experienced a similar decrease in off-task behaviors during the iPod phase with 15%. Jackson's average decreased to 10.25% in the PP-Prompt phase. Trend lines for off-task behavior showed that during the baseline phase, Jackson was exhibiting increased off-task

behaviors over time; however, during the intervention phases his off-task behaviors decreased over time.

Written expression scores. During the writing tasks, Jackson achieved an average of 42.5% responses correct during the baseline phase. However, during the PP and iPod phases, Jackson's average writing score was 48.75%. In the PP-Prompt phase, Jackson demonstrated an average of 77.5% responses correct. During the baseline phase, Jackson's last three data points plateaued at 50% correct with only one data point, his first, at 20% to create the positive slope result.

Tim

Off-task behavior. During the baseline phase, Tim (pseudonym) engaged in off-task behaviors for an average of 29% of the time. Like Sherry, his baseline data also showed an increasing trend. During the PP phase, Tim's off-task behaviors reduced to an average of 3.6% with his last three data points. During the iPod phase, Tim engaged in off-task behaviors for an average of 4.25% of the time. For the PP-Prompt phase, Tim off-task percentage decreased to 0%. For both the PP and iPods phases, trend lines representing Tim's off-task behaviors were decreasing overall.

Written expression scores. Tim achieved an average of 52.5% responses correct on the writing task during the baseline phase. During the PP and iPod phases, Tim experienced a decrease in his percent of responses correct with his average being 46% and 50%, respectively. Tim's slight decrease during the PP and iPod phase differs in trend from that of Jackson and Sherry, however, the trend increased between the PP phase and the iPod phase to closely approximate the average for his baseline phase. For the PP-Prompt phase, Tim writing scores' increased to 63.75%.

Social Validity

Results of the Teacher Intervention Rating Scale-15 strongly indicated that Ms. Smith believed the phases used (i.e., PP, iPod and PP-Prompt) were effective and appropriate in decreasing off-task behaviors in the students. Results of the Adapted Child Intervention Profile
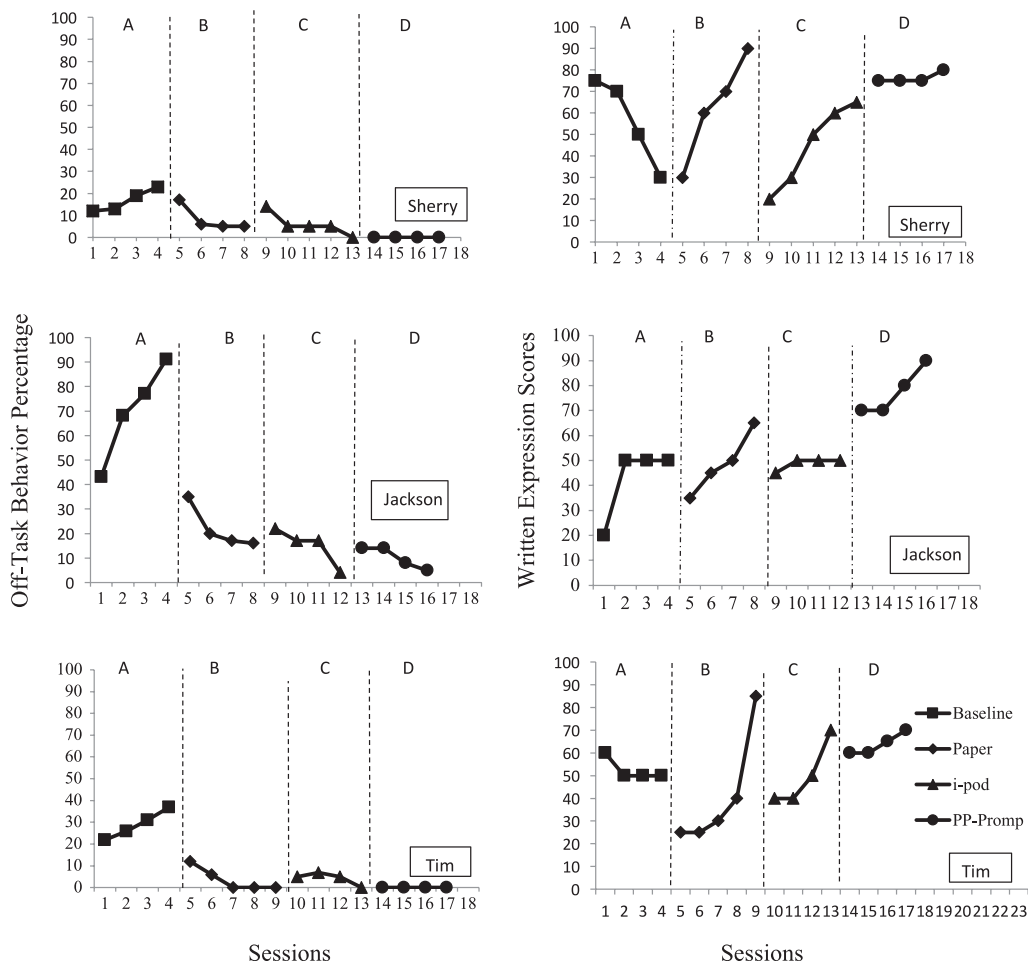
Figure 2: *Off-Task Behavior Percentage and Academic Scores for Student Participants across Conditions*

(Witt & Elliott, 1985) indicated that all three students believed that the intervention was fair and did not generally cause issues with their classmates. Students also believed that there are not generally better ways to deal with behavior than the interventions given. Students liked the intervention and believed that the intervention is good to use at other schools. Students believed that the intervention helped them to behave better in the classroom. Additionally, findings from the Adapted Child Intervention Profile (Witt & Elliott, 1985) indicated that the students felt the intervention phases were appropriate and effective in assisting them to perform better within the classroom setting.

DISCUSSION

This study demonstrates that within the three intervention phases, off-task behavior was reduced across participants; however, all students had their lowest instances of off-task behavior during the PP-Prompt phase. In terms of writing scores, two students (Sherry and Tim) did not show improvement until the introduction of the third phase which included additional prompting from the teacher.

Based on the results, there is not a strong distinction between either of the three intervention phases and the reduction of off-task behavior and increased academic scores for the three student participants. More research on this topic is needed.

The student off-task behavior results of this investigation support the notion that the use of self-management interventions such as self-monitoring have been found to increase academic engagement for students with EBD (Mooney et al., 2005). All students experienced an increase in written expression averages compared to their baseline average, although these changes are not significant within the intervention phases. Based on the KTEA-II, at the time of the study, each participant was working below grade level in the content area of written expression (Table 1). This could be a possible explanation on why two of the three participants did not achieve written expression scores over 70% until the last phase of the investigation. This is also supported by previous research of students with EBD difficulties in the area of written expression (Lane, 2004; Nelson et al., 2004; Regan, Mastropieri, & Scruggs, 2005). However, more research is needed as the findings from this

study are inconclusive and it would be inappropriate to infer that the self-monitoring interventions were effective.

Although the teacher was satisfied with the reductions in off-task behavior in the PP, iPod, and PP-Prompt phases, the teacher was not satisfied with the academic scores of the students. It is important to mention that following this study, the PP phase was continued and the teacher implemented additional, daily one-on-one instructional time with each student participant in an effort to further increase their academic scores. Based on the teacher observation and anecdotal data, the addition of the individual instruction combined with the PP phase resulted in even higher scores on the writing assignments and near zero incidents of off-task behavior for two of the three student participants within a four-week period following the study. Although this cannot be validated through the scientific investigation process, the anecdotal data is worth mentioning here.

Prior to the study, the teacher did not incorporate self-monitoring interventions within instruction and the students exhibited off-task behavior during the content area of writing. Interesting to note, there was not a strong distinction between the use of technology and traditional paper pencil in terms of increasing academic scores. Finally, present results are important because the intervention was socially acceptable to the teacher and students.

Limitations

Although current findings are promising, there are some important study limitations. First, the study was conducted with only one small group of students, and in one geographic location. Generalizations to other student groups, in different locations and settings would not be appropriate. Second, study and intervention duration was quite short (i.e., two months) and there was an absence of generalization and maintenance data. It is unclear if similar effects would occur over longer time periods and/or whether student performances in other domains were impacted. Third, student outcomes were restricted to one academic (i.e., writing quiz scores) and one academic-related outcome (i.e., percentage of students off task). There is the possibility that carry-over or sequence effects between both phases (PP and iPod Touch) may have influenced both methodologies. The dips seen in the initial data points in writing scores when each new methodology was introduced would seem to counter such an argument; however, sequence effects cannot be ruled out. Further, connections should not be made between the recording of one's affective state and increases in academic achievement directly. The data in this study should only be seen as showing a possible logical correlation between the twin acts of examining one's own affective state paired with a stationary scripted and individualized affect calming protocol as possibly influencing off-task behavior during difficult academic tasks. Academic scores did increase over

baseline for all intervention phases which would seem to indicate a possible correlation between increased attention to task and academic achievement.

Implications for Research

Based on the results of the investigation, further research is warranted to examine the impact of emotion regulation upon the on-task engagement and academic performance of students with EBD. Previous self-monitoring research indicates positive results for students with EBD (Mooney et al., 2005), which makes examining emotion regulation through technology or traditional methods a considerable option. In terms of replicating and extending the present investigation, researchers should consider including a second baseline phase after the intervention phases. This will provide clarity in determining if a functional relationship exists between the independent and dependent variables.

Although it is documented that there are varied definitions of students with EBD internationally (Chakraborti-Ghosh et al. 2010; Winzer, 2005), the information gathered in this investigation can be used in classrooms globally in which services are provided for students that exhibit internal and/or external behaviors that impede their academic progress. From a global perspective, an example is children that have been displaced by recent violent conflicts. Refugee children can now be found in 169 countries of refuge around the world (UNHCR, 2015). While the experiences of these children vary, most have experienced traumatic events (Anderson, Hamilton, Moor, Loewen & Frater-Mathieson, 2004). These experiences often result in continuing mental health issues that negatively affect a child's ability to function in a school setting (Dyregrov, 2004). Schwartz and Goremen (2003) reported that often these children struggle with academic performance, exhibit poor self-regulation, have depressive tendencies and display disruptive classroom behaviors. Again, while the terminology for students with disabilities may differ internationally, these children are often identified as having characteristics similar to students with EBD as it relates to their educational setting and curriculum programing.

CONCLUSION

Overall, the results of the study indicate that for the students observed, the addition of a self-monitoring tool to meta-cognitively focus on and possibly reduce any increased affective state was helpful. Results suggest more conclusive evidence is necessary to determine whether a direct relationship between on-task behavior and academic writing proficiency exists (Schunk, 2003). Social validity evaluations did not show a preference for the PP, iPod Touch or PP-Prompt phase but overall indicated that either intervention was in line with what is possible and reasonable in the classroom environment and should be

considered for use as an intervention for students with EBD. While limitations exist, these results support previous studies regarding these relationships and show that advanced technologies may not be worth the added costs and training times required should one choose technology based intervention methods over traditional low-tech options. This may be significant in developing countries that experience the challenges of meeting the needs of students with EBD while in the midst of combating financial instability (Winzer, 2005).

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