Evidence-Based Teaching Strategies for Students With EBD

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Students with emotional and behavioral disorders (EBD) struggle in school, perhaps more so than any other group of students. Whereas it is commonly recognized that these children and adolescents have severe social skills deficits, which impede development of meaningful relationships with peers and teachers, it is also true that students with EBD evidence significant academic deficiencies. On average, these students perform 1.2–2 grade levels behind their peers while in elementary school (Trout, Nordness, Pierce, & Epstein, 2003).

Unfortunately, this discrepancy only worsens with age, and by the time these students reach high school, they are performing almost 3.5 grade levels below their peers, with less than one third of students with EBD functioning at or above grade level in any academic area (Coutinho, 1986; Epstein, Kinder, & Bursuck, 1989). This is not surprising, given that more than half of students with EBD also may meet one or more of the eligibility criteria for a learning disability (Glassberg, Hooper, & Mattison, 1999). These significant academic deficits have resulted in students with EBD attaining one of the worst graduation rates (32.1%) of students with any disability (U.S. Department of Education, 2006). Given that many students with EBD fail to master basic academic skills that are essential to functioning successfully within the community, this elevated school dropout rate only makes a successful transition to the job market more challenging (Gunter & Denny, 1998). As a result, 4 years after leaving high school, this population experiences a postschool unemployment rate of 52% (D'Amico & Marder, 1991).

Despite these dismal academic outcomes, the majority of interventions conducted with these children have focused primarily on behavior modification, often neglecting glaring academic deficiencies (Ryan, Reid, & Epstein, 2004). Recently, however, researchers have begun to place an increased emphasis on addressing the academic deficits of students with EBD to increase their engagement in school, with the hope of improving graduation rates (Mooney, Epstein, Reid, & Nelson, 2003). Given the daunting challenges that teachers of students with EBD face while attempting to address these students' social and academic deficiencies, it is important they incorporate empirically based teaching methods into their classrooms to maximize their teaching effectiveness.

Recently, researchers at the University of Nebraska's Center for At-Risk Children's Services (e.g., Epstein, Nelson, Trout, & Mooney, 2005) summarized the intervention literature targeted at improving the academic skills and performance of students with EBD served in public schools. Conclusions from analyses of this small body of literature indicated that positive outcomes were reported across participants, settings, and subject areas (Nelson, Benner, & Mooney, 2008). In general, these researchers divided academic interventions into three primary categories: (a) peer-mediated interventions (e.g., cross-age tutoring, classwide peer tutoring), in which the student's peers were responsible for providing instruction; (b) self-mediated interventions (e.g., self-monitoring, self-evaluation), in which the responsibility for implementing an intervention rested with the students themselves; and (c) teacher-mediated interventions (e.g., story mapping, mnemonics) wherein the teacher provided the academic instruction to the students.

The purpose of this manuscript is twofold: (a) to highlight findings of these literature reviews covering over three decades of research conducted with students with EBD; and (b) to provide teachers a condensed summary of teaching strategies that have demonstrated efficacy in educating some of the most challenging students in today's schools.

Procedure

Each author acted as lead researcher/author for one of three different academic literature reviews that assessed the efficacy of three types of academic interventions (i.e., peer-mediated, self-mediated, and teacher-mediated) for students with EBD (see Mooney, Ryan, Uhing, Reid, & Epstein, 2005; Pierce, Reid, & Epstein, 2004; Ryan et al., 2004). To be included in these three reviews, articles: (a) must have been published in a peer reviewed journal within the past 40 years; (b) must contain an original report of quasi-experimental or experimental research; (c) must include manipulation of an independent variable; and (d) must include at least one academic measure as a dependent variable. Study participants were required to have a verified emotional, behavioral, or conduct disorder, disability, or disturbance, either through the Individuals with Disabilities

Table 1 Types of Peer-Mediated Interventions

Intervention	Description	Evidence Base	
		Elementary	Secondary
Classwide peer tutoring (CWPT)	Entire class simultaneously participates in tutoring dyads. During each tutoring session, students can participate as both tutor and tutee, or they can participate as either the tutor or tutee.		X
Cooperative learning	Small teams composed of students with different levels of ability use a variety of learning activities to improve the team's understanding of a subject. Each member of a team is responsible not only for learning what is taught but also for helping teammates learn.		X
Cross-age tutoring	Older students are matched with younger students to deliver instruction. Tutors are typically at least 2 years older than the tutees. There do not need to be large differences in skill levels between the tutor and tutee.	X	X
Peer tutoring	Students who need remedial support are paired with select tutors (perhaps highly skilled peers, peers also in need of remedial work, or cross-age tutors). Each member of the dyad may receive and provide tutoring in the same content area, or tutors can provide instruction in a content area in which they are highly skilled.	X	X
Peer-assisted learning strategies	A version of CWPT in which teachers identify children who require help on specific skills and the most appropriate children to help them learn those skills. Pairs are changed regularly, and over time, as students work on a variety of skills, all students have the opportunity to be ''coaches'' and ''players.''	X	
Peer assessment	Peers are used to assess the products or outcomes of learning of other students of similar status.	X	
Peer modeling	Students acting as peer models receive instruction in desired behaviors, then engage in these behaviors in front of students deficient in these areas. The teacher draws the student's attention to the peer model and identifies the desired behaviors the student should emulate.	X	X
Peer reinforcement	Peers provide reinforcement for appropriate responses within the natural environment. The purpose is to reinforce appropriate behaviors of students with disabilities by their peers.	X	

Education Act (IDEA) or classification systems of the *Diagnostic and Statistical Manual of Mental Disorders* IV, or to be described as having behavioral or emotional problems while being educated in a self-contained classroom for students with EBD.

Results

Peer-Mediated Interventions

Peer-mediated interventions require students to implement teacher-selected instruction for their peers as opposed to the more traditional method of teacher-led instruction (Hoff & Robinson, 2002). A wide variety of techniques fall under the peer-mediated instruction category, including peer modeling, peer monitoring, peer network strategies, peer tutoring, cross-age tutoring, reverse-role tutoring, classwide peer tutoring (CWPT), peer-assisted learning strategies (PALS), classwide student tutoring teams, reciprocal peer tutoring, peer counseling, peer assessment, peer mentoring, and cooperative learning (Utley & Mortweet, 1997). A brief description for each of these instructional methodologies and the age groups (e.g., elementary and secondary) with which they have demonstrated efficacy is provided in *Table 1*.

After applying inclusion criteria, Ryan and colleagues (2004) identified 14 studies from nine different special education journals that involved peer-mediated interventions conducted with students with EBD. These studies included 169 participants, of whom 64% were boys and 16% were girls. Five of the studies (36%) were conducted with participants between the ages of 6 and 11 years (n = 44), and the remaining 9 studies (64%) involved adolescents older than 12 years of age (n = 125).

Overall, peer-mediated interventions demonstrated strongly positive findings relative to improving academic performance. As reported by effect size (ES), which represents the strength of an

Table 2 Types of Self-Mediated Interventions

Intervention	Description	Evidence Base	
		Elementary	Secondary
Self-monitoring	A two-stage process of observing and recording one's behavior wherein the student: (a) discriminates occurrence/nonoccurrence of a target behavior; and (b) self-records some aspect of the target behavior.	X	X
Self-evaluation	A process wherein a student compares her/his performance to a previously established criterion set by student or teacher (e.g., improvement of performance over time) and is awarded reinforcement based on achieving the criterion.		X
Self-instruction	A procedure wherein a student uses self-statements to direct behavior.		X
Goal setting	A process wherein a student self-selects a behavioral target (e.g., term paper completion), which serves to structure student effort, provide information on progress, and motivate performance.		X*
Strategy instruction	A process wherein a student is taught a series of steps to independently follow in solving a problem or achieving an outcome.	X	X

Note. Goal-setting was used as part of a multicomponent intervention.

intervention or outcome through a numerical rating in which an ES of 0–0.3 is considered small, 0.3–0.8 is medium, and greater than 0.8 is large (Cohen, 1988), the results were quite remarkable. The authors reported that the overall ES of peer-mediated interventions was 1.875. When evaluating the effectiveness of peer-mediated interventions across academic subject areas, the findings were equally impressive, with large gains seen in math (2.08), history (1.15), and reading (0.81). In addition, Ryan et al. (2004) found that students benefited from this form of instruction regardless of the role they held, be it as tutor (2.02), tutee (0.63), or when sharing both roles (2.12). Similar positive findings were reported even across age groups, be they in elementary grades or high school. Finally, and critical to practitioners, both the students and teachers enjoyed using peer-mediated interventions, reporting high levels of consumer satisfaction. Students made positive comments, claiming that tutoring helped them understand their peers' needs (e.g., empathy), as well as how to ignore inappropriate behavior.

Two specific peer-mediated interventions that demonstrated high levels of efficacy were cross-age and same-age peer tutoring. A successful example of cross-age peer tutoring was conducted by Cochran, Feng, Cartledge, and Hamilton (1993). In this study a special education teacher had half her class of fifth-grade African American boys acting as tutors for teaching sight words to younger students. The tutees were low-performing second-grade African American boys also identified with EBD. Following 8 weeks of peer tutoring sessions that lasted approximately 30 minutes per day, both the tutors and tutees showed greater increases in both sight words and positive social interactions than did their classmates who had not participated in peer tutoring.

Similarly, Falk and Wehby (2001) demonstrated the efficacy of same-age peer tutoring by implementing an instructional program called kindergarten peer-assisted learning strategy (K-PALS), in which higher-functioning readers were paired with lower-performing classmates for reading instruction. The students swapped roles throughout the semester, each taking turns as either the coach or reader during a variety of activities developed to enhance reader fluency and comprehension. Results of the study found that students increased reading skills both in letter-sound correspondence and in blending sounds.

In conclusion, Ryan and colleagues' (2004) review of peer-mediated interventions demonstrated that this form of instruction has the ability to produce large academic gains for students with EBD in a manner that both teachers and students enjoy. In addition, Utley and Mortweet (1997) posited that peer-mediated interventions provide both an effective means for offsetting high teacher-pupil ratios and an effective alternative to one-on-one instruction for students with severe academic deficiencies.

Self-Mediated Interventions

Self-mediated interventions are those in which the students themselves are responsible for providing academic instruction. There are five common types of self-mediated interventions (also known as self-management or self-regulation interventions), including self-monitoring, self-evaluation, self-instruction, goal setting, and strategy instruction. *Table 2* provides a brief

description of each and the specific age groups with which they have demonstrated efficacy, based on current research. In self-mediated interventions, teachers are initially responsible for teaching students how to carry out the instructional activities and ensuring that students can, in fact, complete the tasks. Eventually, the responsibility for carrying out the task transfers to the student.

In all, Mooney and colleagues (2005) identified 22 studies that met inclusionary criteria. These studies involved 78 participants. Students ages 5–11 were included in 12 of the studies (n = 40), with 9 of the studies including only students in that age group. Students 12 years of age and older were participants in 8 studies (n = 38) by themselves and in 3 studies with younger age students (i.e., 5- to 11-year-olds).

Overall, Mooney and colleagues' (2005) review of self-mediated interventions demonstrated positive findings for these academic interventions. The ES or strength of these interventions was impressive. The authors found the overall ES of self-mediated interventions was large (1.80). Individual ESs for each specific type of self-mediated intervention were also large, including those for self-monitoring (1.90), self-evaluation (1.13), strategy instruction (1.75), and self-instruction (2.71). When comparing the effectiveness of these interventions for specific academic subject areas, self-mediated interventions resulted in large gains in writing (1.13), math (1.97), reading (2.28), and social studies (2.66). A review of *Table 2* indicates that self-mediated interventions were more likely to be used in research aimed at secondary-age students.

We highlight two specific examples of effective self-mediated interventions. The first intervention involves a self-monitoring intervention, whereas the second is a strategy-instruction intervention. Regarding self-monitoring, three middle school boys, ages 13–15 years, were taught to monitor their own academic accuracy and productivity across subject areas and during independent work time in the self-contained classroom in which they were enrolled (Carr & Punzo, 1993). Accuracy in reading, for example, was defined as the number of items completed correctly divided by the number of items completed. Productivity was defined as the number of items completed divided by the number of items given. Initially, data were gathered on student performance during independent work times during which students could ask questions about assignments but were expected to complete worksheet activities by themselves and then turn them in. The teacher then graded the students' work and returned it to them without verbal feedback.

Self-mediated intervention training in Carr and Punzo (1993) involved the teacher completing the following steps: (a) providing students an explicit definition of academic achievement, a rationale for improving accuracy and productivity, and examples of achievement from students' own written work; (b) teaching students to count the number of items given, completed, and completed accurately, as well as how to record those numbers on a self-recording sheet; (c) modeling accurate item counting and recording; and (d) asking students to repeat the definition of achievement and rationale for improved importance and to demonstrate accurate self-recording procedures. Following training, data gathering indicated that all three boys improved their accuracy and productivity percentages across subject areas. Improvements also were noted in on-task behavior. Additionally, teacher checks of students' self-recording efforts indicated that students were well able to accurately carry out the tasks.

A second effective self-management strategy was strategy instruction. Skinner, Belfiore, and Pierce (1992) evaluated the effects of cover, copy, and compare (CCC), an instructional technique that promotes high rates of correct and overt student academic responses across multiple content areas. CCC essentially involves students learning and completing the following steps: (a) looking at an item and solution; (b) covering the item and solution; (c) writing the item and solution; and (d) comparing their written response with the original item and solution to check its accuracy. Students whose comparisons are correct move on to the next item in their seatwork, whereas students whose written responses are incorrect repeat the process until their written work is correct (Skinner, Ford, & Yunker, 1991). Skinner et al. (1992) applied the process to social studies with seven upper elementary-aged students served in a self-contained classroom. The students' teacher taught the students the steps in CCC and evaluated its effects on students' abilities to accurately identify states on a map of the United States. Findings indicated that not only did the intervention result in improved average class accuracy over a baseline condition, but that students rated the procedure as highly acceptable as well.

In conclusion, similar to peer-administered treatments, self-mediated interventions have demonstrated their ability to produce large academic gains for students with EBD across subject areas. Teachers, then, can fully expect students, particularly secondary students, to monitor their own academic performance as well as to set goals for academic improvement.

Teacher-Mediated Interventions

Teacher-mediated interventions are those in which the teacher (or an administrator of the intervention other than the student himself/herself or a peer) takes responsibility for treatment, through manipulation of antecedents and/or consequences. *Table 3* provides a description of interventions focusing on the

Table 3 Types of Teacher-Mediated Antecedent-Focused Interventions

Antecedent Interventions	Description	Evidence Base	
		Elementary	Secondary
Verbalize math problems	A process wherein teachers ask students to say math problems aloud before solving them.	X	
Cubicles	A process wherein teachers have students complete their work at their desk in study cubicles enclosed on three sides.	X	
Structured academic tasks	A process wherein teachers require students to complete specific tasks in a sequential order.	X	
Modeling, rehearsal, and feedback	A process wherein teachers model a skill, have the student rehearse the skill, and provide direct feedback about the student's performance.	X	X
Teacher planning strategies	A process wherein teachers are trained to use daily planning procedures based on trend analysis and error analysis.		X
Life space interviewing	Crisis intervention technique in which a student's behavior is discussed with him/her at the time of the problem's occurrence. Practitioners of this approach believe that the student is most receptive to ideas for change when he or she is in crisis.	X	X
Adjusting task difficulty	Teachers adjusted difficulty of arithmetic tasks depending upon a student's success level and failure level.	X	
Previewing	A comprehension strategy that involves activating prior knowledge, predicting, and setting a purpose to improve reading performance.	X	
Sequential prompting	Teachers use multiple levels of prompts (administered in order from most independent to most dependent) to increase academic performance.		X
Adjusting presentation and point-delivery rate	Teachers used two presentation rates and two point-delivery rates to determine best combination for higher student performance.	X	
Teach test-taking skills	Teachers taught students four specific test-taking skills: stem options, absurd options, similar options, and specific determiners.	X	X
Mnemonic instruction	A memory-enhancing instructional strategy that involves teaching students to link new information being taught to information they already know to help students retain specific information.	X	
Taped words and drill instruction	Procedure in which students read lists of words along with a tape that is presented at 80 words per minute.		X
Trial-and-error versus time delay	Teacher allowed students either to read a word immediately when shown a list or to pause until the teacher reads the word and then respond.	X	
Personalized system of instruction	Teachers used written study objectives, division of the course into small units of material, use of the written word, student self-pacing through the curriculum, a high-mastery criteria for advancement to next unit of material, immediate feedback for exams, and use of student tutors to improve spelling performance.	X	
Structured instructional system	Teachers implemented a modified version of the School Survival Skills Curriculum.	X	X
Intertrial interval duration	Teachers adjusted amount of time that occurred between a student reading a word and the presentation of the next word, zero or 5 seconds.	X	
Incorporating student interest	Teachers considered student interest in development and content of lesson.	X	
Teacher versus child control of choice of task and reinforcement	Teachers selected rewards and tasks or allowed students to choose rewards and tasks from a predetermined list.	X	
Story mapping	Process that creates a visual depiction of the settings or the sequence of major events and actions of story characters. Procedure helps students identify the characters, setting, problems, events, and outcomes in narrative text to increase student comprehension.	X	

(Continued on p6)

Table 3 *(Continued)*

Antecedent Interventions	Description	Evidence Base	
		Elementary	Secondary
Choice-making opportunities	Teacher used a six-step method for choice making: Offer student two or more options, ask student to make choice, provide wait time to make choice, wait for individual's response, reinforce with option chosen, and prompt student to make choice if one is not made.	X	
Individual curricular modification	Teachers review functional behavioral assessment results for students to determine instructional and curricular variables associated with undesirable behavior during academic assignment completion.	X	

manipulation of antecedents. These interventions attempt to identify ways in which teachers can intervene before inappropriate behaviors occur that negatively impact academic performance. *Table 4* shows interventions that target manipulation of consequences. These interventions help teachers determine what reinforces students' appropriate responses to instruction. Examples of teacher-mediated interventions include token economies, contingency contracts, adjustments to task difficulty, and story mapping. In each of these interventions, the teacher is in charge of developing and implementing the treatment to produce a change in academic (e.g., math) skills.

Overall, 30 studies from 11 different journals met criteria for inclusion in Pierce and colleagues' (2004) teacher-mediated review. There were 242 participants, 78% of whom were boys and 14% were girls. The remaining 8% of the participants were in 5 studies that did not provide gender information. Forty-seven percent of the participants were 5–11 years old, and 40% were 12 years or older. Thirteen percent of the studies did not report age-specific participant characteristics.

Pierce and colleagues' (2004) review of teacher-mediated interventions demonstrated positive findings, with more than 90% of the studies reviewed showing positive outcomes. The overall mean ES for all teacher-mediated studies was 1.05. Effects of treatment across both antecedent- and consequence-focused interventions were large in magnitude (i.e., ESs of 1.31 and 0.80, respectively). When comparing efficacy across subject areas, teacher-mediated interventions appeared to be most successful in reading, resulting in very high ESs ranging from 1.12–2.68. Gains in math were successful, but less dramatic, with low to moderate ESs ranging from 0.22–0.72.

Although the findings of Pierce and colleagues (2004) were both impressive and important for our field, two different but equally striking findings emerged. First, these interventions were effective despite being implemented only for very short durations (i.e., an average of 22 days per treatment). It is encouraging to know that these types of interventions can have such a positive impact over such a short

Table 4 Types of Teacher-Mediated Consequence-Focused Interventions

Consequence Intervention	Study	Evidence Base	
		Elementary	Secondary
Token reinforcement system	Teachers provided points or tokens to students for retention of information gained while watching television news.		X
Contingency reinforcers	Teachers examined effect of teacher-specified contingencies versus student-specified contingencies to improve academic performance.	X	
Use of free time	Teacher provides increasing amounts of free time to students based on increasing number of sight words learned.	X	
Academic contracting	Teachers contracted with student to earn specified reinforcer for predetermined levels of academic improvement.	X	
Written feedback	Teacher provides written feedback on accuracy in reading to determine effects on improvement in reading.	X	
Bonus contingency in token program	Teacher added bonus contingencies into a standard token economy when students earned 80% or higher accuracy on math assignments.		X

duration. Still, research has shown that we may not be maintaining treatments long enough to effect significant, durable change for students with EBD (McConaughy, Kay, & Fitzgerald, 2000). Second, it was difficult to judge the functional value of these interventions, because only 23% of the studies reviewed reported any type of social validity information. That is, it is difficult to determine whether the interventions reviewed were useful and useable for teachers in other classrooms (Ruhl & Berlinghoff, 1992). This leaves teachers who read these studies with few options but to infer judgment about the potential effectiveness of the interventions in their own classrooms.

Several successful examples of teacher-mediated instruction are provided. The first involves the use of personalized systems of instruction (PSI) to improve spelling performance of 10 elementary-aged boys with EBD (McLaughlin, 1991). Researchers examined the number of spelling tests students passed with 100% accuracy. Initially, data were collected on student spelling performance given regular spelling instruction. Data were then collected to determine student performance in spelling when PSI was used and students were not given the opportunity to retake a spelling test. Finally, data were collected on student performance on spelling tests when PSI was implemented and retakes were allowed. Teacher-mediated intervention training in McLaughlin (1991) involved accurate implementation of PSI. Teachers were trained in the following areas: (a) written study objectives, (b) division of course content into smaller units, (c) use of the written word, (d) student self-pacing through the curricula, (e) a high-mastery criteria to advance to the next unit of material, (f) immediate feedback as to performance on exams or quizzes, and (g) the use of student proctors or tutors. Following training and implementation, results indicated that student performance on spelling tests increased each week with a large improvement in spelling performance overall.

Another example of a successful teacher-mediated intervention involved the use of story mapping to improve reading comprehension skills of students with EBD (Babyack, Koorland, & Mathes, 2000). Fourth- and fifth-grade students took part in a program that was designed to improve academic skills and provide behavior support. The researchers used a method that included teaching the parts of a story and the use of Five Story Parts worksheets, focusing on the main character, setting, problem in the story, story outcome, and major events. Students were asked a series of eight questions relating to the story mapping worksheet after they read a story (e.g., When did the story take place? What four things that happened when _____ tried to solve the problem?). Overall, results showed students made large gains in their reading comprehension skills.

In conclusion, we have evidence to support the use of teacher-mediated interventions for improving the academic performance of students with EBD. Many of the interventions reviewed in *Tables 3* and *4* showed the potential for substantial improvement of various academic skills for students with EBD. However, results of Pierce et al. (2004) also indicated that there are still issues within this body of research that need to be addressed before we can confidently generalize some of the findings demonstrated in the studies reviewed to wider populations of students.

Discussion

Given that research has demonstrated that poor academic performance frequently leads to negative outcomes for students with EBD in both the short term (e.g., school failure and increased dropout rates), and long term (e.g., unsuccessful transition to the job market and community) (U.S. Department of Education, 2006), it is critical for educators to properly address the serious academic deficiencies of students with EBD. Currently, there is a clear and forceful call for educators to incorporate evidence-based procedures in schools. In fact, the essence of the No Child Left Behind Act of 2001 was for schools to focus on academic instruction and methods that have been proven effective. The purpose of this paper was to provide educators a review of academic interventions (i.e., peer-, self-, and teacher-mediated) that have been demonstrated to be effective for teaching students with EBD.

Limitations. It is important to remember that although the academic interventions discussed herein have resulted in positive outcomes for students with EBD, many of the studies were conducted with relatively few students. This means that many of the studies did not include a representative sampling of all types of students with EBD (e.g., female, Hispanic). Hence, it is difficult to generalize these findings to all students with EBD. In order to strengthen these findings, additional studies will need to be conducted in the future on a larger scale. In addition, the academic interventions discussed were conducted under rigorous monitoring and supervision to ensure the specific interventions were implemented as intended. Deviation from the prescribed procedures may impact any intervention's efficacy.

Implications. Educators of students with EBD realize that the students they teach face an inordinate combination of academic and social challenges in comparison with many of their peers. Researchers have long argued over the causal relationship between a child's behavior and his or her poor academic performance. Some researchers today acknowledge that there is likely a reciprocal relationship between the two variables (Trout, Nordness, Pierce, &

Epstein, 2003). To help enhance these students' chances of success in school and as adults within the community, it behooves teachers to incorporate empirically based teaching methods within their classrooms. The authors highly encourage practitioners to read further about each of these interventions to determine which methods would be most suitable to incorporate into their particular classroom settings.

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