Adequate Yearly Progress for Students With Emotional and Behavioral Disorders Through Research-Based Practices

Kimberly J. Vannest, Kimberly K. Temple-Harvey, and Benjamin A. Mason

ABSTRACT: Because schools are held accountable for the academic performance of all students, it is important to focus on academics and the need for effective teaching practices. Adequate yearly progress, a method of accountability that is part of the No Child Left Behind Act (2001), profoundly affects the education of students who have emotional and behavioral disorders (EBD). These students, who typically and consistently perform below grade level, are, or soon will be, tested on grade level across content-area courses. The authors conducted a review of academic interventions for students with EBD to broaden the impact of research by developing a list of instructional interventions that researchers have demonstrated to be effective in improving academic performance of students with EBD.

KEYWORDS: academic interventions, adequate yearly progress, emotional and behavioral disorders, evidence-based interventions, instructional practices

THE NEED TO ACHIEVE ACCOUNTABILITY

The need to achieve accountability standards and demonstrate academic yearly progress (AYP; U.S. Department of Education, 2003a) for students who have traditionall been unsuccessful in the classroom has placed schools under pressure to provide more access to the most effective and efficient practices in academic instruction. For students with emotional and behavioral disorders (EBD), increasing the opportunities to succeed in school and in life requires effective practices designed to improve behavior and academic performance.

Historically, students with EBD have been unsuccessful in gaining the skills necessary to achieve academically and socially (Patterson, DeBeryshe, & Ramsey, 1989) and, therefore, have negative school and life outcomes. For example, on the basis of a review spanning 25 years of the academic status of students with EBD, Epstein, Kinder, and Bursuck (1989) found that students with EBD consistently achieved below expectations. In another review of the academic performance of students with EBD, Trout, Nordness, Pierce, and Epstein (2003) found that 91% of students were “academically deficient” (p. 204), and none performed above grade or age levels. Similarly, Kauffman, Cullinan, and Epstein (1987) noted that students with EBD function a year or more below grade level. Further, researchers have suggested that students with EBD are typically at risk for retention, lower grades (Locke & Fuchs, 1995), and dropping out of school (Locke & Fuchs; Maag & Katsiyannis, 1998; Sitlington & Neubert, 2004; U.S. Department of Education, 2003b). They are also least likely to receive grades of an A or B, demonstrate poor social adjustment, and exhibit increased behavioral difficulties compared with most of their peers with disabilities other than EBD (Bradley, Henderson, & Monfore, 2004).

Despite the poor academic outcomes of students with EBD, AYP under the No Child Left Behind Act (NCLB; 2001) mandates that the academic achievement of these students should be measured in the same manner as that of their nondisabled peers. Thus, the measure and accountability for student success is no longer contained in an individualized education program (IEP) and the special education programming provided, but it is part of the larger accountability requirements of NCLB. The Individuals with Disabilities Education Act (IDEA) and its recent reauthorization aligns with NCLB (U.S. Department of Education, 2005), increasing the focus on access to the general curriculum and academic accountability (Rosenberg, Sindelar, & Hardman, 2004).

Specifically, under AYP, at least 95% of students receiving special education must be assessed (U.S. Department of Education, 2004). AYP is measured by students demonstrating progress in levels of achievement after 2 years and in subsequent thresholds (U.S. Department of Education, 2003a). Proficiency standards are presently measured in reading and math. Failure of specific subgroups to achieve...
AYP may result in serious consequences to schools and school districts (McLaughlin & Thurlow, 2003), such as the need to provide supplemental education services to students from low-income families, implementation of corrective action, and plans for school restructuring after 2, 3, 4, or 5 consecutive years, respectively (U.S. Department of Education, 2003a). Thus, although AYP is not the only measure of progress for students with disabilities, it is one of a public and potentially financial nature.

Accountability and AYP do not measure changes in social behavior, but rather change in academic behavior. Therefore, it is critical that teachers are well prepared to address the educational needs of all students, including those who are at high risk (Rosenberg et al., 2004). For students with EBD, meeting AYP will require instructional expertise in academic content as well as the behavioral and social skills typically found in curriculum and IEP goals. Top teachers are effective and efficient in the instructional time allocated for academic instruction (Vannest, Hagan-Burke, & Hanway, 2006). This use of academic instruction is as important as the social and behavioral interventions typically delivered to students with EBD (Swiecicki & Lynch-Linehan, 1995; Vannest et al.).

Researchers have indicated that teachers do not generally have knowledge of the academic characteristics of students with EBD or effective strategies for addressing those needs (Epstein et al., 1989). The reasons why teachers do not use techniques identified as effective include a lack of treatment acceptability (Gunter & Denny, 1996), distrust of empirical research or researchers (Landrum, Cook, Tankersley, & Fitzgerald, 2002), lack of generalization of specific single-subject research to classroom settings (Ruhl & Berlinghoff, 1992), insufficient teacher training (George, George, Gersten, & Gosenick, 1995), and inadequate teacher preparation programs (Rosenberg et al., 2004).

Although these are understandable reasons for not trusting or failing to use evidence-based practices, they are not sufficient justifications for failing to use data in instructional decision making, particularly because NCLB mandates the use of scientifically based teaching methods (U.S. Department of Education, 2003c). Thus, Shriner and Wehby (2004) noted that efforts to address assessment and accountability will have minimal effect unless teachers improve their classroom strategies by using high-quality, empirically validated instruction.

Educators face greater expectations for instructional performance than ever before and must be particularly efficient, as they are increasingly challenged to decrease behavioral concerns while increasing academic achievement. Teachers are most efficient when adopting techniques that have a high likelihood of success with challenging students.

Finding effective instructional practices for students with EBD is challenging for researchers and even more daunting for teachers. In a review of articles published since the creation of Public Law 94-142 (1976–1990), only 12 included evidence of academic interventions (Ruhl & Berlinghoff, 1992). Following up on Ruhl and Berlinghoff’s review of the literature to include 1991–2004, Vannest and Temple-Harvey (2005) found academic performance to be a dependent variable in 25 instructional interventions. Another research review of evidenced-based practices between 1975 and 2002 found 55 usable studies, but many of these included treatments beyond teaching or instruction (Mooney, Epstein, Reid, & Nelson, 2003). A review of Lane’s (2004) research found 25 articles representing 1990–2004 with studies that have small sample sizes and limited duration. Thus, the majority of research available regarding academic interventions for students with EBD would not meet NCLB’s standard of scientifically based research (Mooney, Denny, & Gunter, 2004).

We conducted a review of the literature to broaden the impact of existing research by identifying academic interventions that show promise for improving the academic performance of students with EBD in school settings. We grouped interventions into two categories—instruction and learning strategies—depending on whether teachers are the primary change agents in implementing teacher-controlled instructional strategies or students are using learning strategies. Given the reality that teachers select interventions, these categories give teachers a choice, in part, on the basis of preference and ease of use. We designed the categories to be easy to decipher and translated the interventions into basic descriptions that are simple to implement.

**METHOD**

**Review of Academic Interventions**

As a follow-up to Ruhl and Berlinghoff’s (1992) research literature review, we conducted an updated research literature review to include 1991–2006. This more recent review focused on interventions that would change academic performance for students with EBD in classroom settings.

Using the ERIC and PSYCLIT databases, we conducted searches of keywords and titles individually and in combination or variations of the following terms: academic, intervention, emotional disorder, behavior disorder, effect, and effectiveness. To avoid omission errors, we hand-searched journals by examining the tables of contents, abstracts, and references pages. The journals that we searched, which dated from 1991 to the most currently published, included Journal of Exceptional Children, Journal of Emotional and Behavioral Disorders, Behavioral Disorders, Remedial and Special Education, Preventing School Failure, Beyond Behavior, and Journal of Applied Behavior Analysis.

We established reliability above 90% on an agreement-by-disagreement basis between two reviewers for all search
term findings in the aforementioned databases. We also established reliability above 90% between three reviewers for the content of the article meeting criteria for inclusion and for the type of intervention classification.

The studies that we selected for the present article met the following criteria: included subjects reportedly meeting definitions accepted by either states or the federal government as the equivalent of emotionally or behaviorally disordered; were empirical (study in which direct observation and reliability data were collected on student performance); had an independent variable that was an academic intervention (teacher-driven changes in instruction, curriculum, or strategies); had an independent variable that was not peer tutoring or self-instruction; and had a dependent variable that was a measure of academic performance in response to a specific teaching strategy.

The review yielded 20 empirical studies on effective academic interventions for students with EBD (see Table 1). Interventions fell into two types: teacher instruction and learning strategies that include student involvement in the learning process. These procedures appear to have evidence of effectiveness for students with EBD and appear to be conducted in classroom settings, many with strategies that teachers, rather than clinical researchers, implement. In the following section, we organize studies into categories on the basis of content area or type of variable under study.

RESULTS

Teacher Instruction

Teacher-based instructional interventions are teacher-manipulated or teacher-initiated strategies designed to teach or present material. The literature review yielded seven instructional interventions in reading, one in spelling, one in math, and five related to instruction in general.

Instruction in Reading

1. Instructional condition: Computer model, teacher model, and no model. Dawson, Venn, and Gunter (2000) examined three instructional approaches to teaching reading to four students with EBD in general education (two first-grade students, two second-grade students) who were receiving reading instruction in a resource classroom. The purpose of their study was to determine the effects of modeling on reading performance and compare the effectiveness of a computer model, teacher model, or no model. The use of the teacher model resulted in more words read correctly than did the use of the computer model or no model. In addition, the use of the computer model resulted in more words read correctly than did the use of no model.

2. Presentation speed and word rehearsal: Taped word read-alongs. Skinner and Johnson (1995) examined reading accuracy and rate with the presentation of fast- and slow-taped words read-alongs. Participants were three students with EBD who were enrolled in a residential school for students with EBD. The students were ages 7, 8, and 9 years with IQ scores of 86, 54, and 71, respectively, with reading achievement scores at the kindergarten to first grade level. Results indicated increased accuracy and rate with gains maintained, regardless of the speed of the taped words. Also, they found pacing variations to be effective in increasing sight-word accuracy.

3. Pacing variations in visual prompt. Skinner, Smith, and McLean (1994) evaluated the difference in sight-word mastery in response to variation in the time between a visual prompt for three students with EBD who were attending a private laboratory school for students with EBD. Participants were ages 9, 10, and 11 years, with an IQ of 70, 79, and 70, respectively, reading at the first- to second-grade level. During this intervention, the researchers used a deck of sight-word cards in immediate succession of see-and-read or with timed intervals of 5 s. The researchers demonstrated large gains in acquisition of sight words for both the immediate and the 5-s delay prompts compared with a no-treatment scenario. In general, students maintained gains for 6 weeks after intervention.

4. Written feedback. McLaughlin (1992) evaluated the effect of providing written feedback on student reading assignments. The study included five students with bipolar disorder (BD) who were between the ages of 10 and 11 years and enrolled in a self-contained classroom for students with BD. McLaughlin found that providing written feedback on student reading assignments improved reading accuracy for all participants, measured by the percentage correct on reading assignments. Specifically, reading accuracy improved from a mean of 49% to 93% (SD not reported) accurate, and the students maintained these gains for 6 to 12 months.

5. Reading instructional programs. Scott and Shearer-Lingo (2002) noted that reading fluency for three seventh-grade boys with EBD who were educated in a self-contained classroom for students with EBD demonstrated progressive improvement with direct instruction phonics programs. The program (Great Leaps) that included phonics sounds, sight phrases, a story, and 1-min timings demonstrated much stronger gains in terms of number of words read per minute than did a similar phonics-based program without the three timed components.

6. Reading intervention. Wehby, Falk, Barton-Arwood, Lane, and Cooley (2003) provided five students with EBD modified versions of the Open Court Reading Program (modified for kindergarten and first grade), supplemented with the Peer-Assisted Learning Strategy (PALS). The students were enrolled in a self-contained...
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<th>Teaching intervention</th>
<th>Content area</th>
<th>Subjects</th>
<th>Setting</th>
<th>Study duration</th>
<th>Source</th>
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<tr>
<td>Instructional condition:</td>
<td>Reading: Words and percentage of words read correctly per minute</td>
<td>4 EBD; Grades 1 and 2; IQ scores: 80–85</td>
<td>Elementary resource classroom for reading</td>
<td>7 sessions; 3 days per week, 3–6 min sessions</td>
<td>L. Dawson, M. L. Venn, &amp; P. L. Gunter (2000)</td>
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<tr>
<td>Computer model, teacher model, no model</td>
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<tr>
<td>Presentation speed and word rehearsal: Taped word read-alongs</td>
<td>Reading: Words read correctly, and words read correctly per minute</td>
<td>3 EBD; 7–9 years old; IQ scores: 86, 54, 71; Reading level: K–1st grade</td>
<td>Residential school for students with EBD</td>
<td>Students received 1-on-1 intervention 2–3 sessions per school day</td>
<td>C. H. Skinner &amp; C. W. Johnson (1995)</td>
</tr>
<tr>
<td>Pacing variations in visual prompt</td>
<td>Reading: Sight word accuracy</td>
<td>3 EBD; 9–11 years old; IQ scores: 70–79; Reading level: 1st–2nd grade</td>
<td>Private laboratory school for students with EBD</td>
<td>16 weeks; 24 school days with maintenance from week 11–16</td>
<td>C. H. Skinner, E. S. Smith, &amp; J. E. McLean (1994)</td>
</tr>
<tr>
<td>Written feedback</td>
<td>Reading: Performance on reading assignments</td>
<td>5 BD (5 boys); 10–11 years old</td>
<td>Self-contained classroom for BD students</td>
<td>12 months; 55 days; baseline and 18–49 days of intervention with follow up from 6–12 months; intervention provided during 1 hour 15 min reading period</td>
<td>T. F. McLaughlin (1992)</td>
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<tr>
<td>Reading instructional programs</td>
<td>Reading: Reading fluency</td>
<td>3 EBD (3 boys); Grade 7; Reading level: 3 years below expectancy</td>
<td>Self-contained classroom for students with EBD</td>
<td>50 school days; 10–15 min lesson; baseline for 1–4 weeks, teach your child for 2 weeks, and Great Leaps for remainder of sessions</td>
<td>T. M. Scott &amp; A. Shearer-Lingo (2002)</td>
</tr>
<tr>
<td>Reading interventions</td>
<td>Reading: Nonsense, word blending, sound naming, sight words, and segmentation probes</td>
<td>5 EBD (5 boys); 7–9 years old; Grades 2–4</td>
<td>Self-contained school for students with EBD</td>
<td>6–9 weekly probes; 15–30 min session for open court; no more than 30 min of PALS implemented 4 times per week</td>
<td>J. H. Wehby, K. B. Falk, S. B. Barton-Arwood, K. L. Lane, &amp; C. Cooley (2003)</td>
</tr>
<tr>
<td>Story mapping</td>
<td>Reading: Story retell and comprehension</td>
<td>4 BD (3 identified, 1 referrals); 10–11 years old; Grades 4–5; IQ scores: 77–87; Reading level: several grade levels below placement</td>
<td>Summer program for students with BD</td>
<td>21–27 sessions over 6 weeks; 30 min per session</td>
<td>A. E. Babyak, M. Koorland, &amp; P. G. Mathes (2000)</td>
</tr>
<tr>
<td>Intervention Type</td>
<td>Content Area</td>
<td>Subjects</td>
<td>Setting</td>
<td>Study Duration</td>
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<td>Personalized system of instruction: Retakes and no retakes</td>
<td>Spelling</td>
<td>10 BD (10 boys); 10–12 years old; Reading level: 1.0–3.6 years below grade level in reading, spelling, and arithmetic</td>
<td>Self-contained classroom</td>
<td>60 days including baseline measures</td>
<td>T.F. McLaughlin (1991)</td>
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<tr>
<td>Opportunity to respond</td>
<td>Math: Correct responses on math problems</td>
<td>9 ED (1 girl, 8 boys); 8–12 years</td>
<td>Self-contained classroom for students with EBD</td>
<td>32 sessions including 17 sessions of observation and feedback</td>
<td>K.S. Sutherland, N. Adler, &amp; P.L. Gunter (2003)</td>
</tr>
<tr>
<td>Scripted lessons</td>
<td>May be used for all curriculum areas</td>
<td>In-service teachers enrolled in graduate course teaching effective instructional strategies for students with EBD</td>
<td>Unreported</td>
<td>3 weeks</td>
<td>P.L. Gunter &amp; T.M. Reed (1997)</td>
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<tr>
<td>Altering instructional interactions by using a talk/mand procedure</td>
<td>Increased compliance with academic tasks</td>
<td>1 severe BD (1 boy); 12 years old; IQ: normal range; Grade 2</td>
<td>Self-contained classroom for students with BD</td>
<td>37 sessions including baseline</td>
<td>P.L. Gunter, R.E. Shores, S.L. Jack, R.K. Denny, &amp; P.A. DePaepe (1994)</td>
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<tr>
<td>Hypothesis-driven accommodations</td>
<td>Written assignments: Problems or questions attempted and percentage of correct responses in math, reading, or science</td>
<td>3 BD (3 boys); 13–14 years old</td>
<td>Segregated school for adolescents with chronic and severe BD</td>
<td>26–27 sessions including baseline, 6–16 sessions of interventions at 50 min in content area</td>
<td>D.A. Penno, A.R. Frank, &amp; D.P. Wacker (2000)</td>
</tr>
<tr>
<td>Functional analysis and hypothesis development</td>
<td>Reading: Turning in acceptable assignments on time</td>
<td>1 ED (1 boy); Grade 8</td>
<td>General education English with resource room support</td>
<td>Unreported</td>
<td>G.S. Gibb &amp; L.K. Wilder (2002)</td>
</tr>
<tr>
<td>Opportunities to respond, academic talk, and praise</td>
<td>Unreported</td>
<td>112 ED students in 20 self-contained classrooms; teacher and classroom observations completed</td>
<td>20 self-contained classrooms</td>
<td>10 15-min sessions; a minimum of 90 min of observation per teacher</td>
<td>K.S. Sutherland, J.H. Wehby, &amp; P.J. Yoder (2002)</td>
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<tr>
<td>Visual organizer, counting up strategy, and manipulative organizer</td>
<td>Math: Addition and subtraction problems</td>
<td>1 EBD (1 boy); Grade 2</td>
<td>Self-contained classroom for students with EBD</td>
<td>16 sessions including 4 baseline sessions; sessions completed in an average of 10 min</td>
<td>K.J. Jolivette, K.A. Lassman, &amp; J.H. Wehby (1998)</td>
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### TABLE 1. (Cont.)

<table>
<thead>
<tr>
<th>Teaching intervention</th>
<th>Content area</th>
<th>Subjects</th>
<th>Setting</th>
<th>Study duration</th>
<th>Source</th>
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<tbody>
<tr>
<td>Academic strategies:</td>
<td>Math: Accuracy</td>
<td>1 EBD (1 boy); 9 years old;</td>
<td>Summer school program for students with</td>
<td>16 sessions including 3 baseline sessions</td>
<td>K. Jolivette, J. H. Wehby, &amp; L. Hirsch (1999)</td>
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<tr>
<td>Right is correct, permanent</td>
<td>based on</td>
<td>Grade 4</td>
<td>academic and behavior needs</td>
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<td>model, and bigger on top</td>
<td>performance on</td>
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<td>math worksheets</td>
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<tr>
<td>Musical mnemonic technique</td>
<td>Math: Basic division</td>
<td>3 EBD (3 boys); 11–14 years</td>
<td>Day school for students with ED</td>
<td>21 sessions</td>
<td>T. Cade &amp; P. L. Gunter (2002)</td>
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<td></td>
<td>calculations</td>
<td>old; IQ scores: Normal range;</td>
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<td>math and reading level: At</td>
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<td>least two grade levels below</td>
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<td>expectancy</td>
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<td>CCC technique</td>
<td>Geography</td>
<td>7 ED (6 boys, 1 girl); 10–11</td>
<td>Self-contained classroom for EBD students</td>
<td>Length unreported; 5-min intervention</td>
<td>C. H. Skinner &amp; P. J. Belfiore (1992)</td>
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<td></td>
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<td>years old</td>
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<td>CCC verbal response</td>
<td>Math: Multiplication</td>
<td>2 BD (2 boys); 9–11 years old;</td>
<td>Residential school for BD children</td>
<td>15 sessions; 3–4 days per week, 3- to 4-</td>
<td>C. H. Skinner, J. M. Ford, &amp; B. D. Yunker (1991)</td>
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<td>technique</td>
<td>(number of digits correct per minute) and percentage correct</td>
<td>IQ scores: 115 (9-year-old) and 80</td>
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<td>min intervention</td>
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<tr>
<td>Test-taking strategies</td>
<td>Test-taking strategies:</td>
<td>6 EBD (5 boys, 1 girl); 13–16</td>
<td>Resource classes for 2–3 periods per day;</td>
<td>12 sessions; 10- to 30-min session</td>
<td>C. A. Hughes &amp; D. D. Deshler (1993)</td>
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<td></td>
<td>Results thought to be</td>
<td>years old; IQ scores: 78–118;</td>
<td>mainstreamed 3–4 periods in at least 1 core content area</td>
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<td></td>
<td>generalizable to different</td>
<td>Reading achievement: Grade</td>
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<td></td>
<td>content areas</td>
<td>level 4.0–6.9</td>
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*Note. PALS = peer-assisted learning strategy; BD = bipolar disorder; CCC = copy, cover, compare.*
school for students with EBD, ranged in age from 7 to 9 years, and were in the second through fourth grades. As a result of the reading intervention, three students progressed in their ability to read nonsense words, all students showed positive trends in blending, one student improved in sound naming, two students improved in reading sight words, and three students improved in segmentation probes.

7. **Story mapping.** Babyak, Koorland, and Mathes (2000) found that story mapping resulted in improved reading comprehension for four fourth- and fifth-grade boys with behavioral disorders (three eligible for BD, one referred for eligibility). Participants were between the ages of 10 and 11 years, had an IQ score in the range of 77–87, and were reading several grade levels below grade placement. Story mapping, an adapted strategy from the Peabody PALS (Fuchs, Mathes, & Fuchs, 1994), involves the use of scripted lessons to teach essential story elements. The researchers measured student performance using passage comprehension (ability to retell stories and answer comprehension questions) and knowledge of main idea. Participants demonstrated higher percentages of correct responses for story comprehension on the basis of intervention; however, identifying passage main ideas only improved in one student.

**Instruction in Spelling and Math**

1. **Personalized system of instruction: Retakes and no retakes.** McLaughlin (1991) found that a personalized system of instruction resulted in an increase in the number of spelling lessons passed at 100% for 10 students with BD (entire class) who were enrolled in a self-contained classroom. The students were boys who ranged in age from 10 to 12 years. Student performed highest under the retake condition when compared with no retakes. However, both conditions had higher passing rates than control.

2. **Increased opportunity to respond.** Sutherland, Alder, and Gunter (2003) found improved performance on math tasks when students had increased opportunities to respond. They conducted their study with nine students with ED (one girl, eight boys), ranging in age from 8 to 12 years, who were educated in a self-contained classroom for students with EBD. With increased opportunity to respond, nine students with EBD increased their mean rate of correct responses (per minute) from 1.24 to 2.68. The researchers replicated this once.

**Instruction in General**

1. **Scripted lessons.** Gunter and Reed (1997) demonstrated improvements in the percentage of correct student responses using scripted lessons. The mean percentage of correct and compliant responses to teacher requests increased from 73% to 87%.

2. **Altering instructional interactions.** Gunter, Shores, Jack, Denny, and De Paepe (1994) found that altering instructional interactions to include “effective instructional strategies” (p. 442) resulted in increased compliance with academic requests. They conducted their study on a 12-year-old boy with severe behavior disorders who was educated in a self-contained classroom for students with severe behavior disorders.

3. **Hypothesis-driven accommodations.** Penno, Frank, and Wacker (2000) concluded that hypothesis-driven accommodations improved academic performance in three children with chronic and severe behavior disorders who were attending a separate school for adolescents with chronic and severe BD. Students were provided interventions on the basis of individual hypotheses in 2 of 3 content areas (math, reading, science). On the basis of data from hypothesis testing, the number and accuracy of problems attempted improved on written assignments for both new and review materials when the researchers made instructional modifications. They observed improvement in all students. However, for one student in one-on-one intervention, results were commensurate to baseline in the area of science. Effective interventions included completing assignments on a computer, working with a peer tutor, shortening assignments, and working one-on-one with staff.

4. **Functional analysis and hypothesis development.** Gibb and Wilder (2002) found that when the teacher formulated interventions on the basis of five possible hypotheses for academic failure, one eighth-grade boy with EBD turned in acceptable assignments on time (see Daly, Witt, Martens, & Dool, 1997). The researchers used these five hypotheses to identify and test instructional strategies until they identified one as being effective.

5. **Opportunity to respond, praise, and provide academic talk.** Sutherland, Wehby, and Yoder (2002) found that when teachers provided higher rates of praise, academic talk, and opportunities to respond, students with ED produced higher rates of correct responses. The researchers conducted their study with teachers of 112 students with ED who were educated in 20 self-contained classroom settings.

**Strategy Learning Interventions**

Strategies are interventions that are taught to generate student autonomy and generalization of learning. Thus, strategies are taught to students and self-mediated as opposed to teacher-mediated. The literature review identified seven studies dealing with the effects of instructional strategies on the academic performance of students with EBD. Of the
Strategies in Math

1. **Visual organizer, counting up, and manipulative organizer.** Jolivette, Lassman, and Wehby (1998) evaluated the use of functional assessment to determine interventions for academic content, specifically examining three strategies: visual organizer, counting-up manipulative, and a template or manipulative organizer. The use of the counting-up strategy led to the highest accuracy of responses for subtraction problems for one second grade student with EBD who was receiving instruction in a self-contained classroom for students with EBD.

2. **Various academic strategies.** Jolivette, Wehby, and Hirsch (1999) examined a variety of academic strategies (on the basis of assessment data) that were individualized for each of the three boys in a classroom for students with EBD (one with EBD, one with ADHD, one with autism). Strategies included bottom first (regrouping), permanent model (physical stimulus; Lovitt, 1984), say it before you do it (Kame’enui & Simmons, 1990; Lovitt), visual organizer (Lovitt), and bigger on top (regrouping). The student with EBD improved math accuracy most with the use of permanent model.

3. **Musical mnemonic technique.** Cade and Gunter (2002) researched the use of musical mnemonics in three boys (ages 11, 12, and 14 years) with EBD who were attending a day school for students with ED. The students were reported to have IQ scores in the normal range, but their functioning in reading and math was at least two grade levels below their own. In general, mnemonics refers to the use of visual and auditory clues to aid in retrieval of information. The musical mnemonics used in the present study, consisting of a song and finger game, improved student performance in solving basic division problems. Specifically, the three students with EBD had baseline scores of 4–8% and immediately improved to 96%, 83%, and 100%. All three students maintained at 100%.

**Strategies on Test-Taking Skills**

Test-taking strategies. Hughes and Deshler (1993) taught test-taking strategies on the basis of test-wiseness (Slakter, Koehler, & Hampton, 1970) to six students (five boys, one girl) with EBD who were receiving instruction in an EBD resource room for 2–3 periods per day. The students were between the ages of 13 and 16 years, with IQ scores in the range of 78 to 118 and reading achievement scores ranging from 4.0 to 6.9. A first-letter mnemonic device (PIRATES) was used in this intervention. In the first step (prepare to succeed), students scanned the test, ranked easy sections for work first, and started working within 3 min. Additional steps were the following: Step 2—inspect the instructions; Step 3—read, remember, reduce; Step 4—answer or abandon; Step 5—turn back, in which students return and answer unanswered questions; Step 6—estimate; and the final step (survey), in which students review the test to make sure they answered all of the questions and review answers. Students mastered probe tests and acquired and maintained the use of the test-taking strategy. The researchers also determined that performance may generalize across subject areas. Mean scores prior to intervention ranged from 54–62%, compared with 61–81% postintervention.

As previously noted, the review of research resulted in studies that focused primarily on instructional interventions (14 studies) and learning strategies (6 studies). We did not identify any studies that focused on curriculum-based interventions, which indicates either a lack of interest in research in this area or, more likely, a lack of academically based curriculum specific to students with EBD.

**DISCUSSION**

The present review yielded 20 high-probability interventions teachers may implement in their classroom to improve the academic performance of students with EBD. The descriptive nature of the teacher-mediated interventions provides teachers with evidence-based practices to use in their classroom as they strive to meet AYP. Available interventions also include student and peer-mediated intervention (e.g., self-monitoring, classwide peer tutoring), though these have a fairly large base of existing evidence, and, therefore, we did not include them in the present study. However, different forms of interventions, including teacher, student, or peer mediated interventions, should be considered when creating instructional programs.

Historically, students with EBD have been served in
more restrictive environments than their peers have, though students with EBD are increasingly being served in inclusive settings, and this trend is expected to continue (Simpson, 2004). Increased inclusion may be related to high-stake, accountability-driven reforms (Bradley, Henderson, & Monfore, 2004), and with students with EBD being instructed in general education, they will typically have to participate in standardized assessments. Yet, students with EBD continue to remain 1–3 years below grade level. It is clear that instructional practices must improve.

It is troubling that many evidence-based educational practices are not more widely adopted in schools (e.g., increasing the use of praise, systematic feedback and monitoring, direct instruction). A resistance to things identified as proven or best practice is not unique. This type of ignoring good advice is not specific to teachers; many people engage in behavior that is not always best practice (e.g., not finishing a bottle of antibiotics when feeling better, exercising too little, eating too much). Usually, if a person overeats or overspends, the only one who suffers is that person. However, if people select instructional interventions on the basis of individual preferences or feelings alone, their students suffer.

If students with EBD are to be served successfully through services in a continuum of settings, educators must commit to the use and communication of data. Teachers must become competent in the use of data to inform instruction, measure student achievement, and communicate progress. Adequate yearly progress will be met only when teachers become more efficient and selective in instructional choices. The list of practices we provide is a good starting point.

The practices identified demonstrate some evidence of success, specifically for students with EBD. This is not to say that the interventions would not also improve the academic performance of students who are not EBD, particularly students who demonstrate behavioral concerns but are not yet identified or not eligible as a student with EBD. In fact, the provision of interventions may prevent continued academic and behavioral problems (Feil, Walker, & Severson, 1995), which, in turn, may decrease the number of students referred to special education and improve student and school performance.

Although the interventions we discuss in the present article resulted in student gains, the characteristics of studies were not as convincing as would be desired. The studies were limited in length and number of participants, and were primarily conducted in self-contained classroom settings reserved for students with EBD. The subject pool from which researchers collected data was small. The mean number of subjects across studies was 3.7, with a range of 1 to 10 (excluding the study conducted across 20 self-contained classrooms). The duration of the studies varied but was generally brief, with a range of seven sessions to 1 year. In addition, researchers conducted the majority of studies with students who were educated in self-contained classroom settings or enrolled in schools for students with EBD. Of the 20 studies, 8 were conducted with students enrolled in a self-contained classroom, and 7 were conducted in a school specific to students with EBD. One study was conducted with 112 students enrolled in 20 classes, though data was not collected per student but rather per class. Only three studies included students who were reported to be instructed in the general education setting for at least part of the day. This statistic is alarming because students are increasingly being educated in general education settings; yet, there is limited data that support successful academic interventions for students with ED in these less restrictive environments. Nevertheless, the interventions identified provide a place to begin in the quest to educate all students using evidence-based strategies.

The interventions discussed in the present article are teacher controlled and appear easy to implement. Many of the interventions address improving basic skills in reading and math, with eight studies focusing on reading and five on math. In addition, several studies address the need to conduct a functional assessment to develop interventions on the basis of individual student need. Through addressing the individual needs of students with EBD by using interventions such as those we identified, researchers can anticipate that student academic functioning will improve for students with EBD.

Summary and Conclusion

Evidence-based practices demonstrate results in classrooms and schools. These positive learning experiences change our interactions with students; students and teachers both become more engaged. When students are engaged, they are less likely to be disruptive (Gunter et al., 1994). Students are more likely to be engaged with teaching strategies and instructional materials that are as outstanding as possible. Teachers can improve instruction by selecting and using strategies on the basis of evidence and maintain, adapt, or change those strategies on the basis of data. Educators have a professional obligation to use techniques with evidence to support their effectiveness. Becoming skilled in taking and using data in classrooms to inform decision making is a part of an excellent teacher’s professional competency.

In 1922, Elizabeth Farrell, founder of the Council for Exceptional Children (CEC), spoke to the first annual meeting of CEC and challenged its members to remember that “no one made us become a teacher.” Although the words at first read may appear too strong for a teacher struggling to use and understand the complexities of evidence-based practices and data in the classroom setting, perhaps they can
be reread as a call to do what educators are uniquely capable of doing. Teaching as a vocation is a choice we engage in daily and this choice in how we teach is uniquely powerful in the effects on vulnerable populations. These highest needs students require the most highly qualified teachers.

AUTHOR NOTES
Kimberly J. Vannest is an assistant professor of educational psychology and special education at Texas A&M University. Her interests are effective interventions for students with EBD and the environments, practices and policies that support teachers. Kimberly K. Temple-Harvey is a licensed specialist in school psychology in Texas. Research interests include students with emotional disturbance and their academic performance, academic interventions for students with emotional disturbance, and educational policy. Benjamin A. Mason is a doctoral student at Texas A&M University. His research interests are assessment of risk and behavioral problems.

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